

Supplemental Information for:

Band Gap and Band Alignment Prediction of Nitride based Semiconductors Using Machine Learning

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Table S1: Randomly selected 300 nitrides for model training and testing
R: covalent radius (Å), X: electronegativity, V: valence, I: first ionization energy (MJ/mole)

Number	Nitride	R1	X1	V1	R2	X2	V3	R3	X3	R4	X4	R5	X5	R6	X6	R7	X7	R8	X8	I1	I2	I3	I4	I5	I6	I7	I8	PBE (eV)	HSE (eV)	Band offset (eV)	Formation energy per atom (eV)		
1	Al ₃ GaSc ₂ YN ₃	1.18	1.61	3	1.18	1.61	3	1.18	1.61	1.26	1.81	1.44	1.78	1.44	1.78	1.44	1.36	1.62	1.22	0.5775	0.5775	0.5775	0.5788	0.5583	0.5583	0.6331	0.6	1.8377	3.3152	0.1214	-2.7261		
2	Al ₃ Sc ₂ Sc ₂ YN ₃	1.18	1.61	3	1.18	1.61	3	1.18	1.61	1.44	1.78	1.44	1.36	1.62	1.22	1.62	1.22	1.62	1.22	0.5775	0.5775	0.5775	0.5788	0.5583	0.6331	0.6	0.6	2.3906	3.8304	0.0889	-3.0420		
3	Al ₃ GaSc ₂ Sc ₂ YN ₃	1.18	1.61	3	1.18	1.61	3	1.26	1.81	1.44	1.78	1.44	1.36	1.62	1.22	1.62	1.22	0.5775	0.5775	0.5788	0.5583	0.6331	0.6331	0.6	0.6	2.7342	3.7774	0.0896	-2.9523				
4	AlGaSc ₂ Sc ₂ YN ₃	1.18	1.61	3	1.26	1.81	1.26	1.81	1.26	1.81	1.44	1.78	1.44	1.36	1.62	1.22	1.62	1.22	0.5775	0.5788	0.5788	0.5583	0.6331	0.6331	0.6	0.6	1.9779	3.4488	0.0896	-2.6756			
5	GaN	1.26	1.81	3	1.26	1.81	3	1.26	1.81	1.26	1.81	1.26	1.81	1.26	1.81	1.26	1.81	1.26	1.81	0.5788	0.5788	0.5788	0.5788	0.5788	0.5788	0.5788	0.5788	1.7450	3.3633	0.0000	-2.2815		
6	AlGaInSc ₂ Sc ₂ YN ₃	1.18	1.61	3	1.26	1.81	3	1.44	1.78	1.44	1.78	1.44	1.36	1.62	1.22	1.62	1.22	0.5775	0.5788	0.5583	0.5583	0.6331	0.6331	0.6	0.6	1.9829	3.3405	0.3103	-2.7706				
7	AlGaInSc ₂ Sc ₂ YN ₃	1.18	1.61	3	1.26	1.81	3	1.44	1.78	1.44	1.78	1.44	1.36	1.62	1.22	1.62	1.22	0.5775	0.5788	0.5583	0.5583	0.6331	0.6331	0.6	0.6	2.1800	3.5686	0.3149	-2.7879				
8	BeMgBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.3	1.31	2	1.98	0.89	1.48	1.69	1.11	1.9	1.11	1.9	1.22	2.01	1.41	1.96	0.8995	0.5495	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	1.0338	2.5346	0.6384	-2.3439		
9	BeMgBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.74	1	2	1.48	1.69	1.48	1.69	1.11	1.9	1.11	1.9	1.22	2.01	1.41	1.96	0.8995	0.5898	0.5898	0.5898	0.7865	0.7865	0.7865	0.7865	0.9851	2.4297	0.4817	-2.1498		
10	Be ₂ Sc ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.92	0.95	2	1.98	0.89	1.98	0.89	1.11	1.9	1.11	1.9	1.22	2.01	1.41	1.96	1.41	0.8995	0.5495	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	1.4076	2.8713	0.7122	-2.0370	
11	BeMgSc ₂ Zn ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.3	1.31	2	1.92	0.95	1.31	1.65	1.22	2.01	1.41	1.96	1.41	1.96	1.41	1.96	0.8995	0.5777	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	0.8778	2.5629	0.7327	-2.3211		
12	BeMgSc ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.74	1	2	1.92	0.95	1.98	0.89	1.11	1.9	1.11	1.9	1.22	2.01	1.41	1.96	1.41	0.8995	0.5898	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	2.4449	2.9623	0.6155	-2.5086	
13	Mg ₂ Si ₂	1.3	1.31	2	1.3	1.31	2	1.3	1.31	1.3	1.31	1.11	1.9	1.11	1.9	1.11	1.9	1.11	1.9	1.11	0.7377	0.7377	0.7377	0.7377	0.7865	0.7865	0.7865	0.7865	4.0135	5.7547	0.7831	-2.9931	
14	Be ₂ Cu ₂ Zn ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.74	1	2	1.31	1.65	1.48	1.69	1.22	2.01	1.41	1.96	1.36	1.54	1.48	1.33	0.8995	0.5898	0.5898	0.5898	0.7865	0.7865	0.7865	0.7865	1.5739	3.0410	0.3696	-2.1794		
15	Be ₂ Cu ₂ Si ₂ Zn ₂	0.9	1.57	2	1.74	1	2	1.74	1	1.48	1.69	1.11	1.9	1.11	1.9	1.11	1.9	1.11	1.9	1.48	1.33	0.8995	0.5898	0.5898	0.5898	0.7865	0.7865	0.7865	0.7865	2.1029	3.5993	0.1326	-2.8482
16	Be ₂ Cu ₂ Si ₂ Zn ₂	0.9	1.57	2	1.74	1	2	1.74	1	1.92	0.95	1.11	1.9	1.11	1.9	1.22	2.01	1.48	1.33	0.8995	0.5898	0.5898	0.5898	0.7865	0.7865	0.7865	0.7865	0.6401	2.9249	0.0149	-2.8538		
17	Be ₂ Cu ₂ Si ₂ Zn ₂	0.9	1.57	2	1.92	0.95	2	1.98	0.89	1.48	1.69	1.11	1.9	1.11	1.9	1.41	1.96	1.48	1.33	0.8995	0.5495	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	0.6401	1.2153	2.5334	0.6328	-2.5396	
18	Be ₂ Sc ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.98	0.89	2	1.98	0.89	1.98	0.89	1.11	1.9	1.11	1.9	1.22	2.01	1.41	1.96	1.48	1.33	0.8995	0.5495	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	2.3164	3.7702	0.0965	-2.5396
19	Be ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.74	1	2	1.92	0.95	1.48	1.69	1.11	1.9	1.11	1.9	1.22	2.01	1.41	1.96	1.48	1.33	0.8995	0.5898	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	1.4318	2.8038	0.3687	-2.4561
20	Be ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.31	1.65	2	1.48	1.69	1.48	1.69	1.11	1.9	1.11	1.9	1.22	2.01	1.41	1.96	1.48	1.33	0.8995	0.9064	0.8678	0.8678	0.7865	0.7865	0.7865	0.7865	1.3246	2.7614	0.5376	-2.1957
21	BeMgBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.3	1.31	2	1.74	1	1.98	0.89	1.22	2.01	1.41	1.96	1.48	1.33	0.8995	0.5777	0.5898	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	2.0267	3.4847	0.5328	-2.4279			
22	BeMgBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.92	0.95	2	1.31	1.65	1.48	1.69	1.22	2.01	1.41	1.96	1.48	1.33	0.8995	0.5495	0.9064	0.8678	0.7865	0.7865	0.7865	0.7865	0.6401	1.1139	2.4186	0.1195	-2.1352			
23	BeMgBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.3	1.31	2	1.74	1	1.98	0.89	1.11	1.9	1.11	1.9	1.41	1.96	1.48	1.33	0.8995	0.5777	0.5898	0.5495	0.5495	0.7865	0.7865	0.7865	0.6401	1.8913	3.1257	0.8318	-2.5962	
24	BeMgSc ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.3	1.31	2	1.92	0.95	1.48	1.69	1.22	2.01	1.41	1.96	1.48	1.33	0.8995	0.5777	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	0.6401	1.2300	2.6108	0.6629	-2.2133			
25	BeMgSc ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.98	0.89	2	1.48	1.69	1.48	1.69	1.22	2.01	1.41	1.96	1.36	1.54	1.48	1.33	0.8995	0.5029	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	1.2549	2.6562	0.7106	-2.2642		
26	BeCaBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.74	1	2	1.98	0.89	1.31	1.65	1.11	1.9	1.11	1.9	1.41	1.96	1.36	1.54	1.48	1.33	0.8995	0.5898	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	1.5501	2.9377	0.8698	-2.6039
27	BeBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.98	0.89	2	1.31	1.65	1.48	1.69	1.11	1.9	1.11	1.9	1.41	1.96	1.36	1.54	1.48	1.33	0.8995	0.5029	0.9064	0.8678	0.7865	0.7865	0.7865	0.7865	1.1014	2.4983	0.6615	-2.3957
28	BeCa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.74	1	2	1.92	0.95	1.48	1.69	1.11	1.9	1.11	1.9	1.22	2.01	1.48	1.33	1.48	1.33	0.8995	0.5898	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	1.3639	2.6573	0.4102	-2.6842
29	BeCa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.74	1	2	1.31	1.65	1.48	1.69	1.11	1.9	1.11	1.9	1.22	2.01	1.48	1.33	1.48	1.33	0.8995	0.5898	0.9064	0.8678	0.7865	0.7865	0.7865	0.7865	1.5048	2.9185	0.3102	-2.6842
30	BeCaSc ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.74	1	2	1.92	0.95	1.98	0.89	1.11	1.9	1.11	1.9	1.41	1.96	1.48	1.33	1.48	1.33	0.8995	0.5898	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	2.2407	3.6240	0.8456	-2.7449
31	BeMgBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.3	1.31	2	1.74	1	1.92	0.95	1.41	1.96	1.36	1.54	1.48	1.33	1.48	1.33	0.8995	0.5777	0.5898	0.5495	0.5495	0.7865	0.7865	0.7865	0.6401	2.5180	3.8705	0.4010	-2.7759	
32	BeMgBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.3	1.31	2	1.36	1.54	1.48	1.69	1.11	1.9	1.11	1.9	1.41	1.96	1.36	1.54	1.48	1.33	0.8995	0.5777	0.5898	0.5495	0.5495	0.7865	0.7865	0.7865	1.4799	3.8264	0.2433	-2.6401
33	BeMgBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.92	0.95	2	1.92	0.95	1.98	0.89	1.11	1.9	1.11	1.9	1.41	1.96	1.36	1.54	1.48	1.33	0.8995	0.5495	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	2.2601	3.7523	0.5543	-2.5853
34	BeMgBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.3	1.31	2	1.98	0.89	1.48	1.69	1.11	1.9	1.11	1.9	1.41	1.96	1.36	1.54	1.48	1.33	0.8995	0.5777	0.5495	0.5495	0.7865	0.7865	0.7865	0.7865	1.0239	2.4389	0.7528	-2.4037
35	BeCaSc ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.74	1	2	1.92	0.95	1.31	1.65	1.11	1.9	1.11	1.9	1.41	1.96	1.41	1.96	1.5	1.3	0.8995	0.5898	0.5495	0.9064	0.7865	0.7865	0.7865	0.7865	1.6440	3.1201	0.4198	-2.4598
36	BeMgBa ₂ Cu ₂ Si ₂ Ge ₂ Sn ₂	0.9	1.57	2	1.3	1.31	2	1.98	0.89	1.31	1.65	1.11	1.9	1.11	1.9	1.41	1.96	1.41	1.96														

136	BaCd ₂ Sn ₂ ZrHfNi ₄	1.98	0.89	2	1.48	1.69	2	1.48	1.69	1.48	1.69	1.41	1.96	1.48	1.33	1.48	1.33	1.5	1.3	0.5029	0.8678	0.8678	0.8678	0.7086	0.6401	0.6401	0.6585	1.1396	2.3804	0.8830	-2.3340			
137	ZnCa ₂ Sn ₂ ZrHfHfNi ₄	1.31	1.65	2	1.31	1.65	2	1.48	1.69	1.48	1.69	1.41	1.96	1.36	1.54	1.48	1.33	1.5	1.3	0.9064	0.9064	0.8678	0.8678	0.7086	0.6588	0.6401	0.6585	1.6186	2.9765	0.6736	-2.2303			
138	ZrCa ₂ Ga ₂ Sn ₂ YbNi ₄	1.31	1.65	2	1.48	1.69	2	1.48	1.69	1.48	1.69	1.22	2.01	1.22	2.01	1.41	1.96	1.5	1.3	0.9064	0.8678	0.8678	0.8678	0.762	0.762	0.7086	0.6585	0.9534	2.4131	0.2990	-1.9534			
139	Be ₂ SnGa ₂ YbNi ₄	0.9	1.57	2	0.9	1.57	4	1.11	1.9	1.11	1.9	1.26	1.81	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.8995	0.7865	0.7865	0.5758	0.5583	0.5583	0.6	1.2499	3.0043	0.4524	-2.4943			
140	Be ₂ Ca ₂ AlGa ₂ Sn ₂	0.9	1.57	2	0.9	1.57	4	1.22	2.01	1.22	2.01	1.18	1.61	1.26	1.81	1.44	1.78	1.62	1.22	0.8995	0.8995	0.7865	0.7865	0.5758	0.5583	0.5583	0.6	1.2499	3.0043	0.4524	-2.4943			
141	Be ₂ ZrHfGa ₂ YbNi ₄	0.9	1.57	2	0.9	1.57	4	1.48	1.33	1.5	1.3	1.26	1.81	1.26	1.81	1.62	1.22	1.62	1.22	0.8995	0.8995	0.6401	0.6585	0.5758	0.5758	0.6	0.6	1.6294	2.9174	0.5846	-2.5846			
142	BeMg ₂ SnGa ₂ AlNi ₄	0.9	1.57	2	1.3	1.31	4	1.11	1.9	1.22	2.01	1.18	1.61	1.18	1.61	1.18	1.61	1.18	1.61	0.8995	0.7377	0.7865	0.762	0.5775	0.5775	0.5775	0.5775	2.7039	4.0996	-0.0626	-2.8577			
143	BeMg ₂ SnGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.3	1.31	4	1.11	1.9	1.41	1.96	1.26	1.81	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.7377	0.7865	0.7086	0.5788	0.5583	0.6331	0.6	0.7471	2.2264	0.7835	-2.5139			
144	BeMg ₂ Sn ₂ ZrGa ₂ YbNi ₄	0.9	1.57	2	1.3	1.31	4	1.11	1.9	1.48	1.33	1.44	1.78	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.7377	0.7865	0.6401	0.5583	0.6331	0.6331	0.6	0.7649	3.4056	0.6635	-2.9031			
145	BeMg ₂ SnGa ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.3	1.31	4	1.22	2.01	1.41	1.96	1.18	1.61	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.7377	0.762	0.7086	0.5775	0.5583	0.5583	0.6331	0.6	2.0783	2.2295	0.5841	-2.3074		
146	BeMg ₂ SnGa ₂ AlNi ₄ YbNi ₄	0.9	1.57	2	1.3	1.31	4	1.22	2.01	1.41	1.96	1.18	1.61	1.44	1.78	1.62	1.22	1.62	1.22	0.8995	0.7377	0.762	0.7086	0.5775	0.5583	0.6	0.6	0.5886	2.0117	0.9043	-2.4493			
147	BeMg ₂ SnGa ₂ AlHfNi ₄ YbNi ₄	0.9	1.57	2	1.3	1.31	4	1.22	2.01	1.5	1.3	1.18	1.61	1.44	1.78	1.62	1.22	1.62	1.22	0.8995	0.7377	0.762	0.6585	0.5775	0.5583	0.6	0.6	0.1077	2.4408	0.8522	-2.6084			
148	BeMg ₂ Sn ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.3	1.31	4	1.41	1.96	1.48	1.33	1.18	1.61	1.18	1.61	1.44	1.78	1.62	1.22	0.8995	0.7377	0.7086	0.6401	0.5775	0.5775	0.6331	0.6	0.6	1.0819	2.4831	0.9482	-2.8326		
149	BeMg ₂ SnGa ₂ AlGa ₂ YbNi ₄	0.9	1.57	2	1.3	1.31	4	1.36	1.54	1.5	1.3	1.18	1.61	1.26	1.81	1.44	1.78	1.62	1.22	0.8995	0.7377	0.6588	0.6585	0.5775	0.5788	0.5583	0.6	0.6	1.9203	3.3095	0.5870	-2.7349		
150	BeMg ₂ SnGa ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.3	1.31	4	1.36	1.54	1.5	1.3	1.44	1.78	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.7377	0.5888	0.6585	0.5583	0.6331	0.6	0.6	1.2075	3.0996	0.6733	-2.9014			
151	BeMg ₂ SnGa ₂ HfGa ₂ YbNi ₄	0.9	1.57	2	1.3	1.31	4	1.48	1.33	1.5	1.3	1.26	1.81	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.7377	0.6401	0.6585	0.5788	0.6331	0.6331	0.6	0.6	1.1385	2.5325	0.6929	-3.0403		
152	BeCa ₂ SnGa ₂ YbNi ₄	0.9	1.57	2	1.74	1	4	1.11	1.9	1.11	1.9	1.18	1.61	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.5898	0.7865	0.7865	0.5775	0.6331	0.6331	0.6	0.6	2.0801	3.4892	0.2960	-2.9603		
153	BeCa ₂ SnGa ₂ YbNi ₄	0.9	1.57	2	1.74	1	4	1.11	1.9	1.22	2.01	1.44	1.78	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.5898	0.7865	0.762	0.5583	0.6331	0.6	0.6	0.9979	2.3753	0.7422	-2.6419			
154	BeCa ₂ SnGa ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.74	1	4	1.22	2.01	1.41	1.96	1.18	1.61	1.26	1.81	1.26	1.81	1.44	1.44	1.36	0.8995	0.5898	0.762	0.7086	0.5775	0.5788	0.5788	0.6331	0.6	1.8325	1.2610	0.7577	-2.6107	
155	BeCa ₂ SnGa ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.74	1	4	1.22	2.01	1.41	1.96	1.18	1.61	1.26	1.81	1.44	1.78	1.62	1.22	0.8995	0.5898	0.762	0.7086	0.5775	0.5788	0.6331	0.6	0.6	0.6443	2.0438	0.8755	-2.5124		
156	BeCa ₂ SnGa ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.74	1	4	1.22	2.01	1.48	1.33	1.18	1.61	1.26	1.81	1.44	1.78	1.62	1.22	0.8995	0.5898	0.762	0.6401	0.5775	0.5788	0.5583	0.5583	0.6	0.6	0.8357	2.2445	0.9653	-2.5125	
157	BeCa ₂ SnGa ₂ YbNi ₄	0.9	1.57	2	1.74	1	4	1.22	2.01	1.48	1.33	1.44	1.36	1.44	1.36	1.44	1.36	1.62	1.22	0.8995	0.5898	0.762	0.6401	0.6331	0.6331	0.6331	0.6	0.6	1.8056	3.0720	0.9252	-2.9950		
158	BeCa ₂ SnGa ₂ HfGa ₂ YbNi ₄	0.9	1.57	2	1.74	1	4	1.22	2.01	1.5	1.3	1.26	1.81	1.26	1.81	1.44	1.78	1.62	1.22	0.8995	0.5898	0.762	0.6585	0.5788	0.5788	0.6331	0.6	0.6	1.0431	2.4166	0.9090	-2.6602		
159	BeCa ₂ SnGa ₂ AlGa ₂ YbNi ₄	0.9	1.57	2	1.74	1	4	1.41	1.96	1.41	1.96	1.18	1.61	1.44	1.78	1.62	1.22	1.62	1.22	0.8995	0.5898	0.7086	0.7086	0.5775	0.5583	0.6	0.6	0.1104	1.2525	1.3175	-2.3738			
160	BeCa ₂ SnGa ₂ AlGa ₂ YbNi ₄	0.9	1.57	2	1.74	1	4	1.41	1.96	1.36	1.54	1.44	1.78	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.5898	0.7086	0.6588	0.5583	0.6331	0.6331	0.6	0.6	1.4035	2.7380	0.9689	-2.1964		
161	BeCa ₂ SnGa ₂ YbNi ₄	0.9	1.57	2	1.74	1	4	1.36	1.54	1.48	1.33	1.18	1.61	1.44	1.78	1.62	1.22	1.62	1.22	0.8995	0.5898	0.6588	0.6401	0.5775	0.5775	0.6331	0.6	0.6	1.3769	2.5429	0.9053	-2.5077		
162	BeSr ₂ THfAlGa ₂ YbNi ₄	0.9	1.57	2	1.92	0.95	4	1.36	1.54	1.5	1.3	1.18	1.61	1.26	1.81	1.26	1.81	1.62	1.22	0.8995	0.5495	0.6588	0.6585	0.5775	0.5788	0.5788	0.6	0.6	1.4738	2.7342	1.0787	-2.7612		
163	BeSr ₂ THfAlGa ₂ YbNi ₄	0.9	1.57	2	1.92	0.95	4	1.5	1.3	1.5	1.3	1.18	1.61	1.44	1.78	1.62	1.22	1.62	1.22	0.8995	0.5495	0.6585	0.6585	0.5775	0.6331	0.6331	0.6	0.6	1.7135	2.9252	0.7847	-2.6107		
164	BeBa ₂ SnGa ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.98	0.89	4	1.11	1.9	1.22	2.01	1.26	1.81	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.5029	0.7865	0.762	0.5788	0.5583	0.6331	0.6331	0.6	0.6	0.4775	1.7730	1.1118	-2.4108	
165	BeBa ₂ SnGa ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.98	0.89	4	1.11	1.9	1.5	1.3	1.44	1.78	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.5029	0.7865	0.6585	0.5583	0.5583	0.6331	0.6331	0.6	0.6	0.4272	1.6514	1.2048	-2.6026	
166	BeBa ₂ Sn ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.98	0.89	4	1.41	1.96	1.48	1.33	1.18	1.61	1.26	1.81	1.26	1.81	1.44	1.44	1.36	0.8995	0.5029	0.7086	0.6401	0.5775	0.5788	0.5788	0.6331	0.6	0.6	0.5991	1.8827	1.3403	-2.4934
167	BeBa ₂ SnGa ₂ YbNi ₄	0.9	1.57	2	1.98	0.89	4	1.36	1.54	1.48	1.33	1.26	1.81	1.44	1.78	1.62	1.22	1.62	1.22	0.8995	0.5029	0.6588	0.6401	0.5788	0.6331	0.6	0.6	0.1409	2.5696	1.1821	-2.8943			
168	BeZr ₂ SnGa ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.31	1.65	4	1.11	1.9	1.22	2.01	1.18	1.61	1.18	1.61	1.44	1.78	1.62	1.22	0.8995	0.9064	0.7865	0.762	0.5775	0.5775	0.6331	0.6331	0.6	0.6	2.3275	3.9100	0.8804	-2.7825	
169	BeZr ₂ SnGa ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.31	1.65	4	1.11	1.9	1.48	1.33	1.18	1.61	1.44	1.78	1.44	1.78	1.62	1.22	0.8995	0.9064	0.7865	0.6401	0.5775	0.5788	0.5583	0.5583	0.6	0.6	1.3121	2.9922	0.9092	-2.3402	
170	BeZr ₂ SnGa ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.31	1.65	4	1.22	2.01	1.22	2.01	1.18	1.61	1.26	1.81	1.44	1.78	1.62	1.22	0.8995	0.9064	0.762	0.762	0.5775	0.5788	0.5583	0.6331	0.6	0.6	1.2544	2.9673	1.0512	-2.3482	
171	BeZr ₂ SnGa ₂ AlGa ₂ Sn ₂ YbNi ₄	0.9	1.57	2	1.31	1.65	4	1.22	2.01	1.36	1.54	1.18	1.61	1.26	1.81	1.26	1.81	1.44	1.44	1.78	0.8995	0.9064	0.762	0.6588	0.5775	0.5788	0.5788	0.5583	0.6	0.6	1.6546	3.1560	0.6999	-2.3463
172	BeZr ₂ SnGa ₂ AlGa<																																	

271	SiCdZrHfAGaInScN _i	1.92	0.95	2	1.48	1.69	4	1.48	1.33	1.5	1.3	1.18	1.61	1.26	1.81	1.44	1.78	1.44	1.36	0.5049	0.8678	0.6401	0.6585	0.5775	0.5788	0.5583	0.6331	1.0748	2.3591	0.8957	-2.5665
272	Ba ₂ GeTiGdInScN _i	1.98	0.89	2	1.98	0.89	4	1.22	2.01	1.36	1.54	1.26	1.81	1.26	1.81	1.44	1.78	1.44	1.36	0.5029	0.5029	0.762	0.6588	0.5788	0.5788	0.5583	0.6331	1.9472	3.3198	0.3723	-2.3517
273	Ba ₂ GeHfGaIn ₂ YN _i	1.98	0.89	2	1.98	0.89	4	1.22	2.01	1.5	1.3	1.26	1.81	1.44	1.78	1.44	1.78	1.62	1.22	0.5029	0.5029	0.762	0.6585	0.5788	0.5583	0.5583	0.6	1.6001	2.9669	0.1714	-2.2731
274	Ba ₂ SeGaInScYN _i	1.98	0.89	2	1.98	0.89	4	1.41	1.96	1.41	1.96	1.26	1.81	1.44	1.78	1.44	1.36	1.62	1.22	0.5029	0.5029	0.7086	0.7086	0.5788	0.5583	0.6331	0.6	-0.1367	0.9600	1.3049	-2.1334
275	Ba ₂ TiZrAlSc ₂ N _i	1.98	0.89	2	1.98	0.89	4	1.36	1.54	1.48	1.33	1.18	1.61	1.18	1.61	1.44	1.36	1.44	1.36	0.5029	0.5029	0.6588	0.6401	0.5775	0.5775	0.6331	0.6331	1.7315	2.8638	0.9000	-2.8461
276	BaZnSiHfGaInScYN _i	1.98	0.89	2	1.31	1.65	4	1.11	1.9	1.5	1.3	1.26	1.81	1.44	1.78	1.44	1.36	1.62	1.22	0.5029	0.9064	0.7865	0.6585	0.5788	0.5583	0.6331	0.6	0.4650	1.6505	0.9627	-2.5118
277	BaZrGeSnAlIn ₂ YN _i	1.98	0.89	2	1.31	1.65	4	1.22	2.01	1.41	1.96	1.18	1.61	1.18	1.61	1.62	1.22	1.62	1.22	0.5029	0.9064	0.762	0.7086	0.5775	0.5775	0.6	0.6	-0.0610	1.1218	1.2063	-2.3252
278	BaZrGeZrAlIn ₂ YN _i	1.98	0.89	2	1.31	1.65	4	1.22	2.01	1.48	1.33	1.18	1.61	1.44	1.78	1.44	1.78	1.62	1.22	0.5029	0.9064	0.762	0.6401	0.5775	0.5583	0.5583	0.6	0.1376	1.3370	1.1862	-2.2340
279	BaZrGeGaIn ₂ N _i	1.98	0.89	2	1.31	1.65	4	1.41	1.96	1.41	1.96	1.26	1.81	1.26	1.81	1.44	1.78	1.44	1.78	0.5029	0.9064	0.7086	0.7086	0.5788	0.5788	0.5583	0.5583	-0.2305	1.7052	1.8870	-1.7592
280	Ba ₂ (SiSiZrGa ₂ YN _i	1.98	0.89	2	1.48	1.69	4	1.11	1.9	1.48	1.33	1.26	1.81	1.26	1.81	1.26	1.81	1.62	1.22	0.5029	0.8678	0.7865	0.6401	0.5788	0.5788	0.5788	0.6	0.8506	2.1061	0.8589	-2.3885
281	BaCdGeSnAlGa ₂ N _i	1.98	0.89	2	1.48	1.69	4	1.22	2.01	1.41	1.96	1.18	1.61	1.26	1.81	1.26	1.81	1.26	1.81	0.5029	0.8678	0.762	0.7086	0.5775	0.5788	0.5788	0.5788	-0.2193	0.9807	1.3824	-1.9904
282	BaCdGeTiAlInScN _i	1.98	0.89	2	1.48	1.69	4	1.22	2.01	1.36	1.54	1.18	1.61	1.44	1.78	1.44	1.36	1.44	1.36	0.5029	0.8678	0.762	0.6588	0.5775	0.5583	0.6331	0.6331	0.7699	1.9587	0.8357	-2.4387
283	BaCdSnZrAlGa ₂ YN _i	1.98	0.89	2	1.48	1.69	4	1.41	1.96	1.48	1.33	1.18	1.61	1.26	1.81	1.62	1.22	1.62	1.22	0.5029	0.8678	0.7086	0.6401	0.5775	0.5788	0.6	0.6	0.3594	1.4532	1.0176	-2.3880
284	BaCdSnHfGaIn ₂ YN _i	1.98	0.89	2	1.48	1.69	4	1.41	1.96	1.5	1.3	1.26	1.81	1.44	1.78	1.44	1.78	1.62	1.22	0.5029	0.8678	0.7086	0.6585	0.5788	0.5583	0.5583	0.6	-0.1577	0.9724	1.2952	-2.0767
285	BaCdSnHfInScYN _i	1.98	0.89	2	1.48	1.69	4	1.41	1.96	1.5	1.3	1.44	1.78	1.44	1.78	1.44	1.36	1.62	1.22	0.5029	0.8678	0.7086	0.6585	0.5583	0.5583	0.6331	0.6	0.1245	1.2351	1.2205	-2.2776
286	BaCdTiGaAlGa ₂ N _i	1.98	0.89	2	1.48	1.69	4	1.36	1.54	1.36	1.54	1.18	1.61	1.26	1.81	1.26	1.81	1.26	1.81	0.5029	0.8678	0.6588	0.6588	0.5775	0.5788	0.5788	0.5788	1.1257	2.4330	0.9296	-2.3393
287	BaCdTiZrAlGaInYN _i	1.98	0.89	2	1.48	1.69	4	1.36	1.54	1.48	1.33	1.18	1.61	1.26	1.81	1.44	1.78	1.62	1.22	0.5029	0.8678	0.6588	0.6401	0.5775	0.5788	0.5583	0.6	0.8933	2.0899	0.9756	-2.4188
288	AlN	1.18	1.61	3	1.18	1.61	3	1.18	1.61	1.18	1.61	1.61	1.61	1.18	1.61	1.18	1.61	1.18	1.61	0.5775	0.5775	0.5775	0.5775	0.5775	0.5775	0.5775	0.5775	4.0568	5.7808	-1.1078	-3.2145
289	Zn ₂ GeGaInScYN _i	1.31	1.65	2	1.31	1.65	4	1.11	1.9	1.22	2.01	1.26	1.81	1.44	1.78	1.44	1.36	1.62	1.22	0.9064	0.9064	0.7865	0.762	0.5788	0.5583	0.6331	0.6	0.7336	2.1994	0.6233	-2.3615
290	Zn ₂ GeZrAlInYN _i	1.31	1.65	2	1.31	1.65	4	1.22	2.01	1.48	1.33	1.18	1.61	1.18	1.61	1.44	1.78	1.62	1.22	0.9064	0.9064	0.762	0.6401	0.5775	0.5775	0.5583	0.6	0.9936	2.3725	0.7024	-2.4408
291	ZnCdSiSnIn ₂ ScYN _i	1.31	1.65	2	1.48	1.69	4	1.11	1.9	1.41	1.96	1.44	1.78	1.44	1.78	1.44	1.36	1.62	1.22	0.9064	0.8678	0.7865	0.7086	0.5583	0.5583	0.6331	0.6	0.2630	1.5144	1.0336	-2.2111
292	ZnCdSiTiAlGa ₂ ScN _i	1.31	1.65	2	1.48	1.69	4	1.11	1.9	1.36	1.54	1.18	1.61	1.26	1.81	1.26	1.81	1.44	1.36	0.9064	0.8678	0.7865	0.6588	0.5775	0.5788	0.5788	0.6331	1.6033	3.0426	0.5943	-2.5080
293	ZnCdGeGaAlGaIn ₂ N _i	1.31	1.65	2	1.48	1.69	4	1.22	2.01	1.22	2.01	1.18	1.61	1.26	1.81	1.26	1.81	1.44	1.78	0.9064	0.8678	0.762	0.762	0.5775	0.5788	0.5788	0.5583	0.0643	1.4643	1.2112	-1.9809
294	ZnCdSiTiGaScN _i	1.31	1.65	2	1.48	1.69	4	1.41	1.96	1.36	1.54	1.26	1.81	1.44	1.36	1.44	1.36	1.44	1.36	0.9064	0.8678	0.7086	0.6588	0.5788	0.6331	0.6331	0.6331	1.7875	3.1170	0.5121	-2.5684
295	Cd ₂ SnAlGaIn ₂ N _i	1.48	1.69	2	1.48	1.69	4	1.41	1.96	1.41	1.96	1.18	1.61	1.26	1.81	1.26	1.81	1.44	1.78	0.8678	0.8678	0.7086	0.7086	0.5775	0.5788	0.5788	0.5583	0.0077	0.6786	1.5855	-1.8561
296	Cd ₂ SnZrAlIn ₂ ScN _i	1.48	1.69	2	1.48	1.69	4	1.41	1.96	1.48	1.33	1.18	1.61	1.44	1.78	1.44	1.78	1.44	1.36	0.8678	0.8678	0.7086	0.6401	0.5775	0.5583	0.5583	0.6331	0.4025	1.6095	1.1191	-2.1730
297	Cd ₂ SnZrAlIn ₂ YN _i	1.48	1.69	2	1.48	1.69	4	1.41	1.96	1.48	1.33	1.18	1.61	1.44	1.78	1.62	1.22	1.62	1.22	0.8678	0.8678	0.7086	0.6401	0.5775	0.5583	0.6	0.6	0.5680	1.6978	0.9724	-2.3293
298	Cd ₂ THfGa ₂ ScN _i	1.48	1.69	2	1.48	1.69	4	1.36	1.54	1.5	1.3	1.26	1.81	1.26	1.81	1.44	1.36	1.44	1.36	0.8678	0.8678	0.6588	0.6585	0.5788	0.5788	0.6331	0.6331	1.7189	2.9899	0.6564	-2.5825
299	Cd ₂ HfAlInScYN _i	1.48	1.69	2	1.48	1.69	4	1.5	1.3	1.5	1.3	1.18	1.61	1.44	1.78	1.44	1.36	1.62	1.22	0.8678	0.8678	0.6585	0.6585	0.5775	0.5583	0.6331	0.6	1.2533	2.4644	0.6472	-2.6475
300	CdHfGaScN _i	1.48	1.69	2	1.48	1.69	4	1.5	1.3	1.5	1.3	1.26	1.81	1.26	1.81	1.44	1.36	1.44	1.36	0.8678	0.8678	0.6585	0.6585	0.5788	0.5788	0.6331	0.6331	1.5476	2.8098	0.4395	-2.6269

Table S2: Hyper-parameters for all optimized machine learning models selected

Support vector machine (SVR)	Band gap	Radial kernel, C=23, epsilon=0.001, gamma=0.15
	Band offset	Radial kernel, C=27, epsilon=0.001, gamma=0.2
Linear regression	Band gap	Adam optimizer, learning rate=0.001, training steps=20000, lambda=0
	Band offset	Adam optimizer, learning rate=0.001, training steps=20000, lambda=0
Artificial neural network (ANN)	Band gap	18:40:1, Adam optimizer, learning rate=0.001, training steps=20000, lambda=0.005, ReLU activation function
	Band offset	18:60:1, Adam optimizer, learning rate=0.001, training steps=20000, lambda=0.002, ReLU activation function
Deep neural network (DNN)	Band gap	18:30:35:1, Adam optimizer, learning rate=0.001, training steps=20000, lambda=0.005, ReLU activation function
	Band offset	18:15:60:1, Adam optimizer, learning rate=0.001, training steps=20000, lambda=0.002, ReLU activation function

Table S3: Mean and Gaussian mean values of predicted band gaps and band offsets with different numbers of cation types

	Band gap		Band offset	
	Mean (eV)	Gaussian mean (eV)	Mean (eV)	Gaussian Mean (eV)
1 type	3.807		-0.133	
2 types	3.701	3.736	0.074	0.065
3 types	3.396	3.433	0.418	0.449
4 types	3.086	3.174	0.607	0.610
5 types	2.854	2.924	0.695	0.664
6 types	2.658	2.683	0.756	0.711
7 types	2.484	2.463	0.806	0.757
8 types	2.365	2.324	0.831	0.791

Results are classified by the number of cation types and are sequenced with increasing band gaps in each class. For each nitride, nitrogen anions are not shown.

								Eg (eV)	Band offset (eV)
In	In	In	In	In	In	In	In	1.517	-1.107
Ga	Ga	Ga	Ga	Ga	Ga	Ga	Ga	3.362	0.001
Y	Y	Y	Y	Y	Y	Y	Y	3.655	0.808
Sc	Sc	Sc	Sc	Sc	Sc	Sc	Sc	4.723	-0.468
Al	Al	Al	Al	Al	Al	Al	Al	5.780	0.102

Table S4 (b): 2 types of cations

								Eg (eV)	Band offset (eV)									Eg (eV)	Band offset (eV)
Cd	Cd	Cd	Cd	Sn	Sn	Sn	Sn	1.485	0.011	Zn	Zn	Zn	Zn	Ti	Ti	Ti	Ti	3.688	0.048
Ga	In	In	In	In	In	In	In	1.595	-0.088	Sc	Y	Y	Y	Y	Y	Y	Y	3.699	0.271
In	In	In	In	In	In	In	Y	1.730	-0.239	Sc	Sc	Y	Y	Y	Y	Y	Y	3.700	0.373
Al	In	In	In	In	In	In	In	1.759	-0.594	Mg	Mg	Mg	Mg	Sn	Sn	Sn	Sn	3.703	0.376
Ga	Ga	In	In	In	In	In	In	1.774	-0.672	Ga	Ga	Ga	Ga	Y	Y	Y	Y	3.707	0.311
In	In	In	In	In	In	Y	Y	1.946	-0.876	Al	Al	Ga	Ga	Ga	Ga	Ga	Ga	3.840	0.514
Ga	Ga	Ga	In	In	In	In	In	1.954	-1.030	Al	Al	Al	Y	Y	Y	Y	Y	3.895	0.827
In	In	In	In	In	In	In	Sc	1.994	0.872	Sc	Sc	Sc	Y	Y	Y	Y	Y	3.917	0.053
Zn	Zn	Zn	Zn	Sn	Sn	Sn	Sn	2.155	0.748	In	In	In	Sc	Sc	Sc	Sc	Sc	3.922	0.050
Al	Al	In	In	In	In	In	In	2.216	0.445	Ba	Ba	Ba	Ba	Si	Si	Si	Si	3.980	-0.046
Ga	Ga	Ga	Ga	In	In	In	In	2.272	-0.086	Ga	Ga	Ga	Ga	Ga	Sc	Sc	Sc	3.985	-0.239
Ga	Ga	Ga	Ga	Ga	In	In	In	2.387	-0.296	Ca	Ca	Ca	Ca	Zr	Zr	Zr	Zr	4.014	-0.312
In	In	In	In	In	In	Sc	Sc	2.442	-0.677	Be	Be	Be	Be	Hf	Hf	Hf	Hf	4.022	-0.392
Al	Al	Al	In	In	In	In	In	2.574	-0.923	Ca	Ca	Ca	Ca	Hf	Hf	Hf	Hf	4.027	-0.343
Ga	Ga	Ga	Ga	Ga	Ga	In	In	2.612	-0.520	Al	Al	Al	Ga	Ga	Ga	Ga	Ga	4.036	-0.572
In	In	In	In	In	Y	Y	Y	2.660	-0.427	Be	Be	Be	Be	Zr	Zr	Zr	Zr	4.058	-0.380
Cd	Cd	Cd	Cd	Ge	Ge	Ge	Ge	2.669	-0.469	Sr	Sr	Sr	Sr	Si	Si	Si	Si	4.070	0.029
Ga	Ga	Ga	Ga	Ga	Ga	Y	Y	2.929	-0.691	In	In	Sc	Sc	Sc	Sc	Sc	Sc	4.073	-0.020
Ga	Ga	Ga	Ga	Ga	Ga	Ga	In	2.988	-0.781	Ca	Ca	Ca	Ca	Ti	Ti	Ti	Ti	4.117	0.392
Sr	Sr	Sr	Sr	Sn	Sn	Sn	Sn	3.006	-0.928	Ga	Ga	Sc	Sc	Sc	Sc	Sc	Sc	4.156	0.459
Cd	Cd	Cd	Cd	Ti	Ti	Ti	Ti	3.011	-0.945	Ca	Ca	Ca	Ca	Ge	Ge	Ge	Ge	4.180	-0.782
Cd	Cd	Cd	Cd	Zr	Zr	Zr	Zr	3.027	0.084	Al	Al	Al	Al	Al	Al	In	In	4.215	-0.697
Ba	Ba	Ba	Ba	Sn	Sn	Sn	Sn	3.044	0.207	Sc	Sc	Sc	Sc	Sc	Y	Y	Y	4.228	-0.425
Cd	Cd	Cd	Cd	Hf	Hf	Hf	Hf	3.059	0.149	Sc	Sc	Sc	Sc	Y	Y	Y	Y	4.231	-0.509
In	In	Y	Y	Y	Y	Y	Y	3.082	-0.263	Sc	Sc	Sc	Sc	Sc	Sc	Y	Y	4.255	-0.264
Ga	Ga	Y	Y	Y	Y	Y	Y	3.093	-0.395	Ga	Ga	Ga	Ga	Sc	Sc	Sc	Sc	4.268	-0.220
In	In	In	In	Y	Y	Y	Y	3.104	-0.698	Ga	Ga	Ga	Sc	Sc	Sc	Sc	Sc	4.270	0.371
Be	Be	Be	Be	Sn	Sn	Sn	Sn	3.120	-0.766	Be	Be	Be	Be	Ge	Ge	Ge	Ge	4.379	0.326
Ga	Ga	Ga	Ga	Ga	Ga	Ga	Y	3.126	0.851	Al	Al	Al	Al	Al	Y	Y	Y	4.385	0.457
In	In	In	In	In	Sc	Sc	Sc	3.155	0.825	Al	Al	Al	Al	Al	Al	Y	Y	4.403	0.439
In	In	In	Y	Y	Y	Y	Y	3.191	0.705	Zn	Zn	Zn	Zn	Si	Si	Si	Si	4.421	0.446
Ba	Ba	Ba	Ba	Zr	Zr	Zr	Zr	3.301	0.534	Be	Be	Be	Be	Ti	Ti	Ti	Ti	4.421	0.449
Ba	Ba	Ba	Ba	Hf	Hf	Hf	Hf	3.314	0.382	Sc	Sc	Sc	Sc	Sc	Sc	Sc	Y	4.432	0.645
Ga	Ga	Ga	Ga	Ga	Y	Y	Y	3.316	0.195	In	Sc	Sc	Sc	Sc	Sc	Sc	Sc	4.464	0.582
Ca	Ca	Ca	Ca	Sn	Sn	Sn	Sn	3.396	0.099	Ga	Sc	Sc	Sc	Sc	Sc	Sc	Sc	4.526	0.706
Zn	Zn	Zn	Zn	Ge	Ge	Ge	Ge	3.405	-0.530	Al	Al	Sc	Sc	Sc	Sc	Sc	Sc	4.565	0.746
Ba	Ba	Ba	Ba	Ti	Ti	Ti	Ti	3.407	-0.300	Al	Al	Al	Al	Ga	Ga	Ga	Ga	4.570	0.748
Sr	Sr	Sr	Sr	Zr	Zr	Zr	Zr	3.416	-0.190	Al	Al	Al	Al	Y	Y	Y	Y	4.587	0.749
Ga	Ga	Ga	Y	Y	Y	Y	Y	3.425	-0.191	Al	Al	Al	Al	Al	Ga	Ga	Ga	4.668	0.768
Sr	Sr	Sr	Sr	Hf	Hf	Hf	Hf	3.433	-0.247	Ca	Ca	Ca	Ca	Si	Si	Si	Si	4.701	0.698
Al	Al	Y	Y	Y	Y	Y	Y	3.445	-0.176	Al	Sc	Sc	Sc	Sc	Sc	Sc	Sc	4.706	0.815
Al	Al	Al	Al	In	In	In	In	3.445	0.005	Mg	Mg	Mg	Mg	Hf	Hf	Hf	Hf	4.784	0.879
Ga	Ga	Ga	Ga	Ga	Ga	Ga	Sc	3.453	0.082	Mg	Mg	Mg	Mg	Zr	Zr	Zr	Zr	4.792	0.881
In	Y	Y	Y	Y	Y	Y	Y	3.454	0.337	Al	Al	Al	Sc	Sc	Sc	Sc	Sc	4.834	0.881
Ga	Y	Y	Y	Y	Y	Y	Y	3.480	0.416	Mg	Mg	Mg	Mg	Ge	Ge	Ge	Ge	4.857	-0.241
Sr	Sr	Sr	Sr	Ti	Ti	Ti	Ti	3.499	0.194	Al	Al	Al	Al	Al	Al	Ga	Ga	4.960	-0.054
In	In	In	In	Sc	Sc	Sc	Sc	3.500	0.073	Mg	Mg	Mg	Mg	Ti	Ti	Ti	Ti	5.008	0.366
Ga	Ga	Ga	Ga	Ga	Ga	Sc	Sc	3.549	-0.019	Al	Al	Al	Al	Al	Al	Al	In	5.015	0.222
Al	Ga	Ga	Ga	Ga	Ga	Ga	Ga	3.550	0.127	Al	Al	Al	Al	Al	Al	Al	Y	5.015	0.499
Zn	Zn	Zn	Zn	Zr	Zr	Zr	Zr	3.578	-0.532	Al	Al	Al	Al	Al	Al	Sc	Sc	5.087	0.545
Zn	Zn	Zn	Zn	Hf	Hf	Hf	Hf	3.589	-0.329	Al	Al	Al	Al	Al	Sc	Sc	Sc	5.150	0.100
Al	Y	Y	Y	Y	Y	Y	Y	3.628	-0.147	Al	Al	Al	Al	Sc	Sc	Sc	Sc	5.274	0.267
Cd	Cd	Cd	Cd	Si	Si	Si	Si	3.637	0.098	Be	Be	Be	Be	Si	Si	Si	Si	5.358	0.672
Ba	Ba	Ba	Ba	Ge	Ge	Ge	Ge	3.651	0.133	Al	Al	Al	Al	Al	Al	Al	Ga	5.390	0.522
Sr	Sr	Sr	Sr	Ge	Ge	Ge	Ge	3.675	0.464	Al	Al	Al	Al	Al	Al	Al	Sc	5.404	0.733
Al	Al	Al	Al	Al	In	In	In	3.681	0.738	Mg	Mg	Mg	Mg	Si	Si	Si	Si	5.753	0.767

Table S4 (c): 3 types of cations

Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)									
Cd	Cd	Sn	Sn	In	In	In	In	In	0.044	0.854	Sr	Sr	Sr	Ba	Sn	Sn	Sn	2.987	-0.210	Al	Al	Ga	Ga	Ga	Ga	In	3.449	0.331	Mg	Ba	Ba	Ba	Si	Si	Si	3.921	1.184																						
Sr	Sr	Sn	Sn	In	In	In	In	In	0.371	0.725	Sr	Zn	Zn	Zn	Zr	Zr	Zr	2.989	-0.646	Be	Be	Be	Be	Sn	Sn	Zr	Zr	3.450	0.696	Be	Be	Be	Be	Ge	Ge	Sn	3.924	1.076																					
Ba	Ba	Sn	Sn	In	In	In	In	In	0.420	0.551	Cd	Cd	Cd	Cd	Si	Si	Hf	2.990	-0.641	Mg	Mg	Si	Si	Ga	Ga	Ga	3.451	0.751	Be	Be	Zr	Zr	Ga	Ga	Ga	3.924	1.098																						
Cd	Cd	Ge	Ge	In	In	In	In	In	0.554	0.397	Cd	Cd	Cd	Cd	Ge	Ge	Hf	2.991	-0.449	Ca	Ca	Zr	Zr	Sc	Sc	Sc	3.451	0.631	Be	Be	Si	Si	Y	Y	Y	3.924	1.076																						
Ca	Ca	Sn	Sn	In	In	In	In	In	0.561	0.213	Sr	Sr	Ba	Ba	Sn	Sn	Sn	2.994	-0.302	Be	Be	Be	Ca	Hf	Hf	Hf	3.452	0.691	Ca	Ca	Ca	Ca	Ti	Ti	Hf	3.927	0.937																						
Zn	Zn	Sn	Sn	In	In	In	In	In	0.596	0.113	Zn	Zn	Ge	Ge	Y	Y	Y	2.997	-0.324	Ba	Ba	Ba	Ba	Ge	Ge	Sn	3.454	0.863	Zn	Zn	Cd	Cd	Si	Si	Si	3.932	0.916																						
Sr	Sr	Ge	Ge	In	In	In	In	In	0.906	0.613	Be	Be	Zr	Zr	In	In	In	2.998	-0.259	Be	Cd	Cd	Cd	Zr	Zr	Zr	3.454	0.640	Be	Be	Be	Be	Ti	Ti	Hf	3.933	0.864																						
Ba	Ba	Sn	Sn	Ga	Ga	Ga	Ga	Ga	0.923	0.442	Cd	Cd	Cd	Cd	Ge	Ge	Zr	3.000	-0.317	Sr	Sr	Sr	Sr	Ge	Zr	Zr	3.455	0.641	Be	Be	Sr	Sr	Si	Si	Si	3.940	0.896																						
Sr	Sr	Sn	Sn	Ga	Ga	Ga	Ga	Ga	0.927	0.299	Ba	Ba	Zr	Zr	Y	Y	Y	3.003	-0.314	Be	Be	Ge	Ge	Y	Y	Y	3.455	0.648	Mg	Mg	Zn	Zn	Ti	Ti	Ti	3.941	1.053																						
Cd	Cd	Sn	Sn	Ga	Ga	Ga	Ga	Ga	0.930	0.112	Al	Al	In	In	In	In	Sc	3.006	-0.227	Mg	Mg	Cd	Cd	Hf	Hf	Hf	3.459	0.885	Mg	Mg	Mg	Mg	Sn	Sn	Sn	3.945	0.839																						
Ba	Ba	Ge	Ge	In	In	In	In	In	0.945	0.026	Cd	Cd	Cd	Cd	Zr	Zr	Hf	3.006	-0.323	Zn	Zn	Zn	Zn	Ge	Ge	Ge	3.460	0.955	Al	Al	Sc	Sc	Sc	Sc	Y	3.952	0.792																						
Zn	Zn	Ge	Ge	In	In	In	In	In	1.092	0.277	Sr	Sr	Hf	Hf	Y	Y	Y	3.008	-0.313	Be	Be	Be	Be	Sn	Sn	Ti	3.460	1.057	Ca	Ca	Ca	Ca	Ti	Ti	Zr	3.952	0.790																						
Ca	Ca	Ge	Ge	In	In	In	In	In	1.103	0.148	Al	Al	Al	Al	Ga	Ga	In	3.009	-0.298	Al	Al	Ga	Ga	Ga	Y	Y	Y	3.462	0.822	Al	Al	Sc	Sc	Y	Y	Y	3.956	0.351																					
Mg	Mg	Sn	Sn	In	In	In	In	In	1.151	-0.043	Cd	Cd	Cd	Cd	Ti	Zr	Zr	3.009	-0.457	Be	Be	Be	Ca	Zr	Zr	Zr	3.463	0.827	Be	Be	Be	Be	Ti	Ti	Hf	3.956	0.380																						
Ca	Ca	Sn	Sn	Ga	Ga	Ga	Ga	Ga	1.226	-0.136	Sr	Ba	Ba	Ba	Sn	Sn	Sn	3.010	-0.517	Sr	Sr	Sr	Sr	Si	Si	Zr	3.465	0.835	Mg	Mg	Hf	Hf	Sc	Sc	Sc	3.958	0.702																						
Cd	Cd	Si	Si	In	In	In	In	In	1.306	-0.211	Sr	Zn	Zn	Zn	Hf	Hf	Hf	3.011	-0.262	Be	Be	Sn	Sn	Sc	Sc	Sc	3.469	0.107	Sr	Sr	Sr	Sr	Si	Si	Ti	3.961	0.859																						
Ba	Ba	Cd	Cd	Cd	Sn	Sn	Sn	Sn	1.308	-0.398	Ca	Ca	Ca	Ba	Sn	Sn	Sn	3.012	-0.452	Ga	Sc	Y	Y	Y	Y	Y	3.469	0.196	Be	Be	Be	Be	Ge	Ge	Zr	3.962	1.081																						
Ba	Ba	Cd	Cd	Cd	Sn	Sn	Sn	Sn	1.341	-0.494	Mg	Cd	Cd	Cd	Ge	Ge	Ge	3.012	-0.518	Ca	Ba	Ba	Ba	Ti	Ti	Ti	3.471	0.517	Be	Be	Be	Mg	Hf	Hf	Hf	3.964	1.111																						
Sr	Sr	Cd	Cd	Cd	Sn	Sn	Sn	Sn	1.368	-0.468	Ca	Ca	Cd	Cd	Zr	Zr	Zr	3.012	-0.228	Mg	Mg	Ba	Ba	Zr	Zr	Zr	3.471	0.633	In	Sc	Sc	Sc	Y	Y	Y	3.964	1.440																						
Sr	Cd	Cd	Cd	Cd	Sn	Sn	Sn	Sn	1.371	-0.569	Sr	Sr	Hf	Hf	Al	Al	Al	3.013	-0.253	Be	Cd	Cd	Cd	Hf	Hf	Hf	3.475	0.946	Be	Be	Si	Si	Ga	Ga	Ga	3.965	1.288																						
Ba	Ba	Ge	Ge	Ga	Ga	Ga	Ga	Ga	1.483	-0.770	Cd	Cd	Cd	Cd	Zr	Zr	Zr	3.017	-0.265	Zn	Zn	Zn	Zn	Ti	Ti	Zr	3.475	0.992	Ga	Ga	Ga	Ga	Sc	Sc	Sc	3.968	1.246																						
Cd	Cd	Ge	Ge	Ga	Ga	Ga	Ga	Ga	1.491	-0.279	Cd	Cd	Cd	Cd	Sn	Sn	Ti	3.017	0.250	Al	Al	Ga	Ga	Ga	Ga	Y	3.476	0.898	Be	Zn	Zn	Zn	Ti	Ti	Ti	3.969	1.264																						
Sr	Sr	Ge	Ge	Ga	Ga	Ga	Ga	Ga	1.499	-0.198	Ca	Ca	Hf	Hf	Ga	Ga	Ga	3.018	0.169	Sr	Sr	Sr	Sr	Ti	Ti	Ti	3.476	0.950	In	Sc	Sc	Sc	Y	Y	Y	3.970	1.081																						
Ba	Ba	Sn	Sn	Al	Al	Al	Al	Al	1.501	-0.181	Cd	Cd	Cd	Cd	Ti	Hf	Hf	3.019	0.211	Al	Al	Al	Al	In	In	In	3.478	1.118	Ca	Ca	Ca	Ca	Ge	Hf	Hf	3.973	1.053																						
Ca	Ca	Cd	Cd	Cd	Sn	Sn	Sn	Sn	1.540	-0.227	Cd	Cd	Cd	Cd	Si	Si	Zr	3.021	0.301	Zn	Zn	Zn	Zn	Ge	Zr	Zr	3.478	0.911	Mg	Mg	Mg	Mg	Sn	Sn	Zr	3.978	1.121																						
Zn	Zn	Sn	Sn	Ga	Ga	Ga	Ga	Ga	1.544	-0.154	Ca	Ca	Ti	Ti	Ga	Ga	Ga	3.025	0.093	Ca	Ca	Ca	Zn	Ge	Ge	Ge	3.479	0.887	Be	Be	Zr	Zr	Sc	Sc	Sc	3.982	1.161																						
Ca	Cd	Cd	Cd	Sn	Sn	Sn	Sn	Sn	1.547	0.022	Sr	Zn	Zn	Zn	Ti	Ti	Ti	3.025	0.085	Ca	Ca	Zr	Zr	Al	Al	Al	3.481	0.888	Al	Al	Al	In	Sc	Sc	Sc	3.983	1.311																						
Sr	Sr	Sn	Sn	Al	Al	Al	Al	Al	1.576	-0.332	Be	Be	Be	Ba	Hf	Hf	Hf	3.028	0.450	Sr	Sr	Sr	Sr	Ti	Ti	Ti	3.481	1.117	Sr	Ba	Ba	Ba	Si	Si	Si	3.986	1.064																						
Cd	Cd	Cd	Cd	Si	Si	Sn	Sn	Sn	1.593	-0.305	Be	Be	Be	Ba	Zr	Zr	Zr	3.029	0.375	Zn	Zn	Hf	Hf	Sc	Sc	Sc	3.489	1.180	Ga	Ga	Cd	Cd	Sc	Sc	Sc	3.987	0.984																						
Cd	Cd	Cd	Cd	Ge	Sn	Sn	Sn	Sn	1.613	-0.295	Ba	Ba	Ba	Ba	Zn	Ge	Ge	3.032	0.340	Mg	Mg	Ba	Ba	Hf	Hf	Hf	3.490	1.259	Mg	Cd	Cd	Si	Si	Si	3.987	0.976																							
Zn	Cd	Cd	Cd	Sn	Sn	Sn	Sn	Sn	1.615	-0.207	Ba	Ba	Zr	Zr	Sc	Sc	Sc	3.032	0.405	In	In	In	Sc	Sc	Sc	Y	3.492	1.009	Be	Sr	Sr	Si	Si	Si	3.989	0.481																							
Mg	Mg	Ge	Ge	In	In	In	In	In	1.672	-0.042	Zn	Zn	Hf	Hf	Ga	Ga	Ga	3.033	0.261	Be	Be	Be	Be	Ge	Ge	Sn	3.493	0.972	Ga	Sc	Sc	Sc	Sc	Y	Y	3.990	0.508																						
Sr	Sr	Si	Si	In	In	In	In	In	1.691	-0.443	Al	Al	In	In	In	Y	Y	3.039	0.333	Ca	Ca	Ba	Ba	Ti	Ti	Ti	3.493	0.974	Be	Be	Be	Mg	Zr	Zr	Zr	3.991	0.820																						
Ba	Ba	Si	Si	In	In	In	In	In	1.709	-0.411	Cd	Cd	Cd	Cd	Zr	Hf	Hf	3.044	0.394	Ca	Ca	Ca	Ca	Si	Sn	Sn	3.494	0.211	Be	Be	Be	Be	Ti	Zr	Zr	3.991	0.943																						
Cd	Cd	Ti	Ti	In	In	In	In	In	1.716	-0.372	Zn	Zn	Zn	Cd	Ge	Ge	Ge	3.045	0.235	In	In	In	Sc	Y	Y	Y	3.495	0.292	Ca	Ca	Ca	Ca	Zr	Zr	Hf	3.993	1.127																						
Zn	Zn	Cd	Cd	Sn	Sn	Sn	Sn	Sn	1.723	-0.213	Ba	Ba	Ti	Ti	Al	Al	Al	3.051	0.329	Mg	Mg	Ba	Ba	Ge	Ge	Ge	3.496	0.600	Zn	Zn	Si	Si	Sc	Sc	Sc	3.995	1.151																						
Cd	Cd	Hf	Hf	In	In	In	In	In	1.779	-0.705	Ca																																																

Sr	Sr	Sr	Zn	Sn	Sn	Sn	Sn	2.382	-0.276	Ba	Ba	Ba	Ba	Ge	Ge	Sn	Sn	3.218	0.824	Ca	Ca	Ca	Sr	Hf	Hf	Hf	Hf	3.625	1.004	Mg	Mg	Mg	Mg	Sn	Sn	Sn	Sn	Ti	4.187	0.646
Be	Be	Be	Sr	In	Sn	Sn	Sn	2.389	-0.295	Sr	Sr	Sr	Sr	Si	Si	Sn	Sn	3.219	0.767	Al	Sc	Y	Y	Y	Y	Y	Y	3.626	1.157	Mg	Mg	Mg	Mg	Zn	Ti	Ti	Ti	Ti	4.189	0.213
Al	Al	Ga	In	In	In	In	In	2.389	-0.355	Ba	Ba	Ba	Zn	Hf	Hf	Hf	Hf	3.220	0.774	Zn	Zn	Zn	Zn	Si	Si	Zr	Zr	3.627	0.949	Be	Be	Be	Be	Si	Si	Zr	Zr	Zr	4.189	0.236
Al	Al	In	In	In	In	In	Y	2.393	-0.472	Ca	Ca	Ca	Cd	Zr	Zr	Zr	Zr	3.221	0.727	Sr	Sr	Sr	Ge	Ti	Ti	Ti	Ti	3.629	0.895	Al	Al	Al	Al	Ga	Ga	Ga	Y	4.190	0.253	
Be	Zn	Zn	Zn	Sn	Sn	Sn	Sn	2.398	-0.500	Mg	Mg	Mg	Ca	Sn	Sn	Sn	Sn	3.222	0.775	Al	Ga	Ga	Ga	Ga	Ga	Ga	Sc	3.632	0.891	Be	Be	Be	Sr	Si	Si	Si	Si	4.192	0.439	
Mg	Mg	Mg	Cd	Sn	Sn	Sn	Sn	2.404	-0.544	Ga	Ga	Ga	Ga	In	Y	Y	Y	3.223	0.757	Sr	Ba	Ba	Ba	Ge	Ge	Ge	Ge	3.633	0.113	Al	Al	Al	Al	In	In	Sc	Sn	4.190	0.649	
Ca	Ca	Hf	Hf	In	In	In	In	2.405	-0.591	Be	Be	Ba	Ba	Ge	Ge	Ge	Ge	3.223	0.701	Sr	Sr	Ba	Ba	Ge	Ge	Ge	Ge	3.636	0.117	Mg	Mg	Ca	Ca	Ge	Ge	Ge	Ge	4.208	0.250	
Ga	Ga	Ga	In	In	In	In	Sc	2.414	-0.761	Cd	Zn	Cd	Cd	Ti	Ti	Ti	Ti	3.225	0.772	Be	Ba	Ba	Ba	Hf	Hf	Hf	Hf	3.637	0.329	Al	Sc	Sc	Sc	Sc	Sc	Y	Y	4.213	0.266	
Ba	Cd	Cd	Cd	Ti	Ti	Ti	Ti	2.418	-0.297	Cd	Cd	Cd	Cd	Si	Si	Si	Ge	3.226	0.706	Mg	Mg	Zr	Zr	Y	Y	Y	Y	3.638	0.385	Ca	Ca	Ca	Ba	Si	Si	Si	Si	4.214	0.290	
Zn	Zn	Sn	Sn	Y	Y	Y	Y	2.425	-0.109	Ba	Ba	In	Zn	Hf	Hf	Hf	Hf	3.226	0.623	Ga	Ca	Sc	Sc	Sc	Sc	Y	Y	3.639	0.522	Ca	Ca	Ca	Ge	Ti	Ti	Ti	Ti	4.214	0.682	
Ga	Ga	Ga	Ga	In	In	In	Y	2.431	0.134	Ca	Ca	Zn	Zn	Y	Y	Y	Y	3.227	0.570	Ca	Ca	Ba	Sc	Ge	Ge	Ge	Ge	3.639	0.542	Al	Al	Sc	Y	Y	Y	Y	Y	4.218	0.942	
Mg	Mg	Si	Si	In	In	In	In	2.433	0.185	Zn	Zn	Zn	Cd	Zr	Zr	Zr	Zr	3.230	0.922	Be	Be	Ca	Ca	Hf	Hf	Hf	Hf	3.639	-0.163	Al	Al	Al	Sc	Sc	Y	Y	Y	4.223	0.064	
Ba	Ba	Cd	Cd	Ti	Ti	Ti	Ti	2.434	0.509	Ca	Ca	Hf	Hf	Y	Y	Y	Y	3.231	0.961	Zn	Zn	Zn	Zn	Sn	Ti	Ti	Ti	3.639	0.003	Mg	Mg	Mg	Mg	Sn	Sn	Zr	Zr	4.223	-0.012	
Mg	Mg	Zn	Zn	Sn	Sn	Sn	Sn	2.437	0.773	Be	Be	Be	Ba	Ti	Ti	Ti	Ti	3.233	0.906	Mg	Mg	Sr	Sr	Ge	Ge	Ge	Ge	3.641	0.408	Ca	Ca	Ca	Ca	Si	Si	Ge	Ge	4.233	0.653	
Be	Be	Zn	Zn	Sn	Sn	Sn	Sn	2.438	-0.110	Al	Al	Ga	Ga	Ga	Ga	Y	Y	3.233	0.834	Sr	Sr	Sr	Ba	Ge	Ge	Ge	Ge	3.641	0.286	Ga	Sc	Sc	Sc	Sc	Sc	Y	Y	4.242	1.088	
Al	Ga	Ga	Ga	In	In	In	In	2.444	0.139	Zn	Zn	Zn	Zn	Ge	Ge	Ge	Hf	3.235	0.846	Mg	Mg	Mg	Cd	Zr	Zr	Zr	Zr	3.642	0.541	Al	Al	Al	Al	Al	In	Y	Y	4.242	1.345	
Be	Be	Be	Zn	Sn	Sn	Sn	Sn	2.446	0.198	Be	Be	Be	Be	Si	Sn	Sn	Sn	3.239	0.923	Al	Al	Al	Ga	Ga	Ga	Ga	In	3.642	0.583	Be	Be	Be	Be	Sn	Ti	Ti	Ti	4.243	0.356	
Ca	Ca	Cd	Cd	Ge	Ge	Ge	Ge	2.448	0.519	Ga	Ba	Ga	In	Y	Y	Y	Y	3.239	0.814	Mg	Mg	Zn	Zn	Ge	Ge	Ge	Ge	3.643	-0.031	Ca	Ca	Ca	Si	Ti	Ti	Ti	Ti	4.243	0.217	
Ca	Ca	Zr	Zr	In	In	In	In	2.450	0.754	Ba	Ba	Ba	Ba	Si	Si	Sn	Sn	3.239	0.817	Be	Be	Ca	Ca	Zr	Zr	Zr	Zr	3.645	0.093	Al	Al	Sc	Sc	Sc	Sc	Sc	Y	4.244	1.099	
Be	Be	Sr	Sr	Sn	Sn	Sn	Sn	2.474	0.029	In	In	In	In	Sc	Sc	Sc	Y	3.243	0.922	Mg	Mg	Hf	Hf	Ga	Ga	Ga	Ga	3.645	0.424	Mg	Ca	Ca	Ca	Zr	Zr	Zr	Zr	4.253	1.472	
Ba	Cd	Cd	Cd	Zr	Zr	Zr	Zr	2.474	0.092	Ca	Ca	Ca	Cd	Hf	Hf	Hf	Hf	3.246	1.014	Ba	Ba	Ba	Ba	Si	Ge	Ge	Ge	3.648	0.272	Be	Be	Be	Be	Ge	Ge	Ge	Ti	4.255	1.701	
Zn	Zn	Cd	Zn	Sn	Sn	Sn	Sn	2.487	0.392	Zn	Zn	Zn	Cd	Hf	Hf	Hf	Hf	3.248	1.148	Be	Be	Be	Be	Sn	Hf	Hf	Hf	3.649	0.440	Mg	Mg	Ca	Ca	Ti	Ti	Ti	Ti	4.256	0.761	
Ba	Cd	Cd	Cd	Hf	Hf	Hf	Hf	2.512	0.629	Al	In	Y	Y	Y	Y	Y	Y	3.249	1.139	Mg	Mg	Mg	Cd	Hf	Hf	Hf	Hf	3.652	0.469	Ca	Ca	Ca	Ca	Si	Si	Ti	Ti	4.257	0.541	
Zn	Zn	Zn	Zn	Sn	Sn	Sn	Sn	2.513	-0.130	Ba	Ba	Ba	Ba	Ti	Ti	Ti	Hf	3.250	0.918	Ca	Ca	Ti	Ti	Sc	Sc	Sc	Sc	3.652	-0.280	Mg	Mg	Hf	Hf	Al	Al	Al	Al	4.265	0.545	
Zn	Zn	Zn	Zn	Ge	Ge	Sn	Sn	2.515	0.195	Be	Be	Ba	Ba	Ti	Ti	Ti	Ti	3.251	1.027	Sr	Sr	Sr	Sr	Si	Si	Ti	Ti	3.653	-0.164	Mg	Mg	Mg	Ca	Ge	Ge	Ge	Ge	4.269	0.680	
Ba	Ba	Zn	Zn	Ge	Ge	Ge	Ge	2.518	0.447	Ba	Ba	Ba	Ba	Ba	Sn	Hf	Hf	3.252	1.148	Ca	Ca	Ca	Ca	Sn	Sn	Hf	Hf	3.654	0.126	Mg	Mg	Sr	Sr	Si	Si	Si	Si	4.271	0.867	
Ga	In	In	In	In	In	Sc	Sc	2.527	0.044	Al	Ga	Y	Y	Y	Y	Y	Y	3.256	0.897	Al	Al	Al	Ga	Ga	Y	Y	Y	3.656	-0.053	Al	Al	Al	Sc	Sc	Sc	Sc	Y	4.272	0.372	
Sr	Sr	Cd	Cd	Ti	Ti	Ti	Ti	2.532	0.294	Be	Be	Sr	Sr	Zr	Zr	Zr	Zr	3.258	0.997	Be	Zn	Zn	Zn	Ge	Ge	Ge	Ge	3.658	0.125	Mg	Ca	Ca	Ca	Hf	Hf	Hf	Hf	4.272	0.238	
Ga	Ga	Ga	Ga	In	In	In	Y	2.540	0.085	Sr	Sr	Sr	Cd	Si	Si	Si	Si	3.262	1.146	Ca	Ca	Ca	Ca	Si	Si	Sn	Sn	3.658	0.158	Be	Be	Cd	Cd	Si	Si	Si	Si	4.274	0.670	
Sr	Cd	Cd	Cd	Ti	Ti	Ti	Ti	2.545	0.328	Al	Al	Al	Ga	Ga	Ga	In	In	3.262	0.830	Be	Be	Ti	Ti	Y	Y	Y	Y	3.659	0.188	Be	Ca	Ca	Ca	Zr	Zr	Zr	Zr	4.276	0.667	
Be	Ba	Ba	Ba	Sn	Sn	Sn	Sn	2.553	0.442	Ba	Ba	Ba	Ba	Sn	Zr	Zr	Zr	3.263	0.810	Ga	Ga	Ga	Ga	Sc	Sc	Y	Y	3.661	0.352	Al	Al	Al	Al	Ga	Ga	Ga	In	4.288	0.804	
Ba	Ba	Ge	Ge	Sc	Sc	Sn	Sc	2.555	0.432	Be	Be	Sr	Sr	Hf	Hf	Hf	Hf	3.265	0.846	Sr	Sr	Sr	Sr	Si	Ti	Ti	Ti	3.661	0.746	Mg	Mg	Mg	Ca	Ti	Ti	Ti	Ti	4.289	0.538	
Cd	Cd	Cd	Cd	Sn	Sn	Ti	Ti	2.564	0.389	Zn	Zn	Zn	Zn	Ge	Ge	Ge	Zr	3.265	0.817	Sr	Sr	Sr	Sr	Si	Ge	Ge	Ge	3.665	0.574	Be	Ca	Ca	Ca	Hf	Hf	Hf	Hf	4.296	0.394	
Al	Ga	Ga	Ga	Ga	In	In	In	2.564	0.577	Be	Be	Hf	Hf	Y	Y	Y	Y	3.266	0.789	Ca	Ca	Ca	Zn	Zr	Zr	Zr	Zr	3.665	0.758	Ca	Ca	Ca	Sr	Si	Si	Si	Si	4.297	0.697	
Ga	Ga	Ga	Ga	In	In	Y	Y	2.578	0.863	Sr	Sr	Zn	Zn	Si	Si	Si	Si	3.267	0.838	Al	Al	Al	Ga	Ga	Si	Y	Y	3.665	0.789	Al	Al	Al	Al	Ga	Ga	Y	Y	4.298	0.675	
Cd	Cd	Hf	Hf	Ga	Ga	Ga	Ga	2.579	0.465	Ba	Ba	Ba	Ba	Ti	Ti	Zr	Zr	3.268	0.870	Sr	Sr	Sr	Zn	Si	Si	Si	Si	3.666	0.346	Al	In	Sc	Sc	Sc	Sc	Sc	Sc	4.300	0.805	
Sr	Cd	Cd	Cd	Zr	Zr	Zr	Zr	2.599	0.466	Al	Al	Al	In	In	Y	Y	Y	3.270	0.865	Ca	Sr	Sr	Sr	Ge	Ge	Ge	Ge	3.666	0.472	Ca	Ca	Ca	Ca	Ge	Ge	Ge	Ti	4.305	0.569	
Ca	Cd	Cd	Cd	Ge	Ge	Ge	Ge	2.600	0.439	Mg	Mg	Ca	Ca	Sn	Sn	Sn	Sn	3.271	0.871	Sr	Zn	Zn	Zn	Si	Si	Si	Si	3.667	0.802	Be	Ca	Ca	Ca	Ti	Ti	Ti	Ti	4.307	0.424	
Cd	Cd	Ti	Ti	Ga	Ga	Ga	Ga	2.605	0.627	Cd	Cd	Zr	Zr	Sc	Sc	Sc	Sc	3.273	-0.109	In	In	In	Sc	Sc	Sc	Sc	Y	3.668	0.620	Mg	Ca	Ca	Ca	Ti	Ti	Ti	Ti	4.310	0.524	
Al	Al	In	In	In	In	In	Sc	2.608	0.857	Sr	Sr	Zn	Zn	Zr	Zr	Zr	Zr	3.274	-0.241	Al	Al	Sc	Y	Y	Y	Y	Y	3.669	0.730	Be	Be	Be	Be	Ge	Ti	Ti	Ti	4.320	0.804	
Ca	Ca	Ca	Zn	Sn	Sn	Sn	Sn	2.618	0.386	Ba	Ba	Si	Si	Sc	Sc	Sc	Sc	3.274	-0.270	Ba	Ba	Ba	Ba	Si	Si	Ge	Ge	3.671	0.749	Be	Be	Be	Be	Ge	Ge	Ti	Ti	4.320	1.001	
Cd	Cd	Cd	Cd	Ge	Ge	Ge	Hf	2.621	0.354	Zn	Zn	Zn	Zn	Ge	Ge	Hf	Hf	3.283	0.204	Ca	Ca	Ca	Zn	Ti	Ti	Ti	Ti	3.672	-0.064	Mg	Mg	Ti	Ti	Sc	Sc	Sc	Sc	4.328	0.259	
Ba	Ba	Cd	Cd	Cd	Si	Si	Si	2.624	0.511	Ba	Ba	Ba	Ba	Ge	Ge	Hf	Hf	3.285	-0.185	In	Sc	Sc	Y	Y	Y	Y	Y	3.672	0.044	Be	Be	Ti	Ti	Sc	Sc	Sc	Sc	4.334	0.132	
Sr	Sr	Zn	Zn	Ge	Ge	Si	Si	2.629	0.738	Sr	Sr	Ti	Ti	Y	Y	Y	Y	3.285	-0.193	Ca	Ca	Zn	Zn	Y	Si	Si	Si	3.674	0.332	Be	Be	Be	Mg	Ti	Ti	Ti	Ti	4.335	0.864	
Cd	Cd	Zr	Zr	Ga	Ga	Ga	Ga	2.631	0.161	Ba	Ba	Ba	Ba	Zr	Zr	Hf	Hf	3.287	0.165	Mg	Sr	Sr	Sr	Ti	Ti	Ti	Ti	3.677	0.164	Al	Al	Ga	Ga	Sc	Sc	Sc	Sc	4.340	1.18	

Zn	Zn	Zn	Zr	In	In	In	In	2.864	0.031	Ba	Ba	Ba	Bi	Ti	Ti	HF	3.394	0.659	Be	Zn	Zn	Zr	Zr	Zr	Zr	3.816	0.792	Mg	Mg	Mg	Mg	Ti	Zr	Zr	4.755	0.667	
Zn	Zn	Zn	Zn	Sn	HF	HF	HF	2.873	0.102	Ba	Ba	Ba	Ti	Ti	Ti	Zr	3.397	0.505	Be	Zn	Zn	Zr	HF	HF	HF	3.818	0.729	Be	Mg	Mg	Mg	Ge	Ge	Ge	4.766	0.694	
Ba	Zn	Zn	Zn	HF	HF	HF	HF	2.878	0.058	Cd	Cd	Zr	Zr	Al	Al	Al	3.399	0.482	Sr	Sr	Sr	Sr	Si	Si	Si	3.828	0.854	Mg	Mg	Mg	Mg	Si	Si	HF	4.767	0.418	
In	In	In	In	In	Sc	Sc	Y	2.881	0.443	Ga	Ga	Ga	Ga	Sc	Y	Y	3.399	0.681	Mg	Mg	Mg	Sr	Ge	Ge	Ge	3.830	0.897	Mg	Mg	Mg	Mg	Zr	Zr	HF	4.768	0.473	
Ca	Cd	Cd	Cd	Zr	Zr	Zr	Zr	2.885	0.262	Sr	Sr	Sr	Sr	Zr	HF	HF	3.402	0.499	Al	Al	Al	Al	In	In	Sc	3.835	0.889	Mg	Mg	Mg	Mg	Zr	HF	HF	4.769	0.432	
Zn	Ba	Zn	Zn	Ti	Ti	Ti	Ti	2.885	0.112	Ba	Ba	Ba	Si	HF	HF	HF	3.402	0.475	Ca	Ca	Ca	Ca	Sn	Sn	Ti	3.840	0.888	Al	Al	Al	Al	Sc	Sc	Y	4.780	0.677	
Cd	Cd	Cd	Cd	Ti	Ti	Ti	Zr	2.886	0.510	Sr	Sr	Sr	Sr	Sn	Sn	Ti	3.404	0.754	Zn	Zn	Ti	Ti	Sc	Sc	Sc	3.841	0.751	Mg	Mg	Mg	Mg	Ti	Ti	HF	4.808	0.891	
Be	Be	Ca	Ca	Sn	Sn	Sn	Sn	2.887	0.287	Ca	Ca	HF	HF	Al	Al	Al	3.406	0.731	Al	Al	Ga	Ga	Ga	Ga	Sc	3.845	0.695	Mg	Ca	Ca	Ca	Si	Si	Si	4.809	0.452	
Cd	Cd	Cd	Cd	Sn	HF	HF	HF	2.889	0.122	Mg	Ba	Ba	Ba	Ge	Ge	Ge	3.407	0.727	Zn	Zn	Zr	Zr	Al	Al	Al	3.849	0.828	Al	Al	Al	Ca	Sc	Sc	Sc	4.815	0.501	
Sr	Sr	Sr	Cd	Zr	Zr	Zr	Zr	2.891	0.393	Ba	Ba	Ba	Ba	Sn	Sn	Ti	3.407	-0.959	Be	Be	HF	HF	Ga	Ga	Ga	3.850	0.864	Mg	Mg	Mg	Mg	Si	Si	Zr	4.826	0.231	
Cd	Cd	HF	HF	Y	Y	Y	Y	2.893	0.193	Ca	Ba	Ba	Ba	Zr	Zr	Zr	3.408	-0.824	Sr	Sr	Sr	Sr	Si	Si	Si	HF	3.853	0.862	Al	Al	Al	Al	In	Sc	Sc	4.837	0.960
Cd	Cd	Ge	Ge	Sc	Sc	Sc	Sc	2.894	0.036	Ga	Ga	Ga	In	Y	Y	Y	Y	3.408	-0.545	Be	Be	Ca	Ca	Ti	Ti	Ti	3.854	0.862	Mg	Mg	Mg	Mg	Ti	Ti	Ti	4.839	1.357
Cd	Cd	Cd	Cd	Sn	Sc	Zr	Zr	2.896	0.462	Ca	Ca	Ba	Ba	Zr	Zr	Zr	3.409	-0.703	Zn	Zn	Zn	Zn	Si	Si	HF	3.855	0.713	Mg	Mg	Mg	Mg	Si	Ge	Ge	4.843	0.126	
Sr	Zn	Zn	Zn	Ge	Ge	Ge	Ge	2.897	0.227	Zn	Zn	Ti	Ti	Y	Y	Y	3.410	-0.410	Al	Sc	Sc	Y	Y	Y	Y	3.858	0.642	Mg	Mg	Mg	Mg	Ge	Ge	Ge	4.876	0.208	
Ba	Ba	HF	HF	Al	Al	Al	Al	2.898	0.047	Ba	Ba	Ba	Bi	Zr	Zr	Zr	3.414	-0.356	Be	Be	Sn	Sn	Al	Al	Al	3.864	0.763	Be	Be	Be	Be	Si	Si	Ti	4.899	0.544	
Al	Al	Al	Ga	In	In	In	In	2.901	0.456	Be	Be	Cd	Cd	Ti	Ti	Ti	3.415	-0.725	Al	Al	In	Y	Y	Y	Y	3.864	0.824	Mg	Mg	Ca	Ca	Si	Si	Si	4.908	1.307	
Cd	Cd	Cd	Cd	Ti	Ti	Ti	HF	2.918	0.427	Sr	Sr	Sr	Sr	Zr	Zr	HF	3.415	-0.581	Ga	Ga	Sc	Sc	Sc	Sc	Y	3.866	0.822	Be	Be	Ti	Ti	Al	Al	Al	4.926	1.703	
Zn	Zn	Zn	Zn	Sn	Sn	Zr	Zr	2.920	0.401	Mg	Cd	Cd	Cd	HF	HF	HF	3.417	-0.274	Be	Be	Be	Be	Ge	Ge	Zr	3.866	0.821	Al	Al	Al	Sc	Sc	Sc	Y	4.927	0.383	
Sr	Sr	Sr	Cd	HF	HF	HF	HF	2.920	-0.730	Be	Be	Bz	HF	HF	HF	HF	3.417	-0.351	Sr	Sr	Sr	Sr	Si	Si	Zr	3.868	0.256	Mg	Mg	Mg	Mg	Si	Si	Sn	4.928	0.414	
Ca	Cd	Cd	Cd	HF	HF	HF	HF	2.921	-0.850	Ca	Cd	Cd	Cd	Si	Si	Si	3.418	0.000	Al	Ga	Ba	Ge	Y	Y	Y	3.869	0.301	Mg	Mg	Mg	Mg	Sn	Si	Ti	4.930	0.940	
Ga	Ga	Ga	In	In	Y	Y	Y	2.929	-0.847	Sr	Sr	Sr	Sr	HF	HF	HF	3.424	0.061	Be	Be	Be	Be	Si	Zr	Zr	3.872	0.635	Mg	Mg	Mg	Zn	Si	Si	Si	4.936	1.622	
Ba	Ba	HF	HF	Y	Y	Y	Y	2.929	-0.503	Be	Be	Be	Cd	Ti	Ti	Ti	3.425	-0.636	Ga	Ga	Ga	Ga	In	Sc	Sc	3.872	0.762	Mg	Mg	Mg	Mg	Ge	Ge	Ti	4.936	1.979	
Cd	Cd	Cd	Cd	Ti	Ti	Ti	Zr	2.932	-0.844	Sr	Ba	Ba	Bi	Ti	Ti	Ti	3.425	-0.481	Mg	Mg	Zn	Zn	Zr	Zr	Zr	3.876	0.990	Al	Al	Al	Al	Ga	Sc	Sc	4.945	0.747	
Be	Be	HF	HF	In	In	In	In	2.937	-0.905	Sr	Sr	Ba	Bi	Ti	Ti	Ti	3.426	-0.084	Ca	Ca	Ca	Ca	Ge	Ge	HF	3.884	1.021	Be	Mg	Mg	Mg	Ti	Ti	Ti	4.970	0.705	
Ca	Ca	Zn	Zn	Ge	Ge	Ge	Ge	2.939	-0.467	Ba	Ba	Ba	Ba	Sn	Ti	Ti	3.427	-0.036	Al	Al	Al	Al	Ga	Ga	Y	3.885	1.189	Al	Al	Al	Al	Al	Al	Ga	Sc	4.977	0.442
Be	Be	Sn	Sn	Y	Y	Y	Y	2.939	-0.770	Ca	Ca	Ba	Ba	HF	HF	HF	3.428	0.392	Zn	Zn	Zn	Zn	Si	Si	Zr	3.887	1.069	Be	Be	Be	Be	Si	Si	Ge	5.001	0.876	
Ca	Ca	Ba	Ba	Sn	Sn	Sn	Sn	2.942	-0.830	Ca	Ba	Ba	Ba	HF	HF	HF	3.428	0.460	Be	Be	HF	HF	Sc	Sc	Sc	3.887	1.072	Mg	Mg	Mg	Mg	Ge	Ti	Ti	5.008	1.163	
Ba	Ba	Zn	Zn	Ti	Ti	Ti	Ti	2.943	-0.240	Mg	Mg	Ge	Ge	Y	Y	Y	3.429	-0.023	Zn	Zn	Zn	Zn	Si	Si	Ti	3.890	1.068	Mg	Mg	Mg	Mg	Si	Si	Ge	5.020	0.375	
Zn	Zn	Cd	Cd	Ge	Ge	Ge	Ge	2.945	-0.774	Be	Be	Be	Cd	Ge	Ge	Ge	3.429	0.047	Mg	Mg	Zn	Zn	HF	HF	HF	3.891	0.926	Mg	Mg	Mg	Ca	Si	Si	Si	5.037	0.396	
Ba	Ba	Ba	Ba	Sn	Sn	Sn	Sn	2.946	-0.820	Be	Be	Sr	Sr	Ge	Ge	Ge	3.432	0.216	Ca	Ca	Ca	Ca	Ge	Ge	Ge	3.894	0.906	Mg	Mg	Mg	Mg	Si	Ti	Ti	5.050	0.565	
Cd	Cd	Cd	Cd	Ge	Ge	Ge	Ti	2.949	-0.202	Mg	Mg	Cd	Cd	Zr	Zr	Zr	3.432	-0.018	Ba	Ba	Ba	Ba	Si	Si	Si	3.895	0.961	Be	Be	Si	Si	Al	Al	Al	5.106	0.824	
Zn	Zn	Zn	Zn	Ge	Ge	Ge	Sn	2.950	-0.777	Sr	Sr	Sr	Sr	Ti	Zr	Zr	3.434	0.053	Mg	Mg	Ti	Ti	Y	Y	Y	Y	3.899	1.003	Be	Mg	Mg	Mg	Si	Si	HF	5.108	1.034
Ca	Ca	Ge	Ge	Sc	Sc	Sc	Sc	2.953	-0.818	Zn	Zn	Zn	Ti	Ti	HF	HF	3.435	0.074	Ca	Ca	Ca	Ca	Sn	HF	HF	3.900	1.158	Mg	Mg	Mg	Mg	Si	Si	Zr	5.149	0.520	
Ba	Ba	HF	HF	Sc	Sc	Sc	Sc	2.957	-0.475	Sr	Sr	Sr	Sr	HF	HF	HF	3.436	0.216	Mg	Zn	Zn	Zn	Ti	Ti	Ti	3.903	0.908	Mg	Mg	Mg	Mg	Si	Si	Ti	5.166	0.517	
Ba	Bi	Si	Si	Al	Al	Al	Al	2.959	-0.697	Be	Be	Bz	Zr	Zr	Zr	Zr	3.437	0.300	Be	Be	Be	Sn	Sn	Ti	Ti	3.903	0.837	Be	Be	Be	Mg	Si	Si	Si	5.292	0.592	
Ca	Ca	Ge	Ge	Y	Y	Y	Y	2.964	-0.753	Sr	Sr	Sr	Ba	Bi	Ti	Ti	3.438	0.441	Al	Al	Ga	Ga	Ga	Ga	Sc	3.904	0.831	Mg	Mg	Mg	Mg	Si	Si	Ge	5.364	0.827	
Ba	Ba	Zr	Zr	Al	Al	Al	Al	2.964	-0.454	Sr	Sr	Sr	Sr	Si	Si	HF	3.441	0.252	Al	Al	Al	Al	Al	Ga	In	3.909	0.411	Mg	Mg	Mg	Mg	Si	Si	Ti	5.396	1.025	
Ca	Sr	Sr	Sr	Sn	Sn	Sn	Sn	2.967	-0.617	Sr	Sr	Sr	Sr	Ge	HF	HF	3.442	0.368	Be	Be	Be	Be	Ge	Ge	HF	3.917	0.453	Be	Be	Mg	Mg	Si	Si	Si	5.457	0.549	
Cd	Cd	Zr	Zr	Y	Y	Y	Y	2.968	-0.657	Mg	Mg	Cd	Cd	Ti	Ti	Ti	3.442	0.395	Ca	Ca	Ca	Ca	Ge	Zr	Zr	3.918	0.777	Be	Mg	Mg	Mg	Si	Si	Si	5.711	0.541	
Al	Al	In	In	In	In	Sc	Sc	2.971	-0.244	In	Sc	Y	Y	Y	Y	Y	3.444	-0.231	Ca	Ca	Ca	Ca	Sn	Ge	Zr	3.919	0.868										
Ca	Ca	Sr	Sr	Sn	Sn	Sn	Sn	2.978	-0.640	Sr	Sr	Sr	Sr	Ge	Ge	Ge	3.446	-0.128	Ca	Ca	Ca	Ca	Sn	Sn	Ti	3.920	1.054										
Ba	Cd	Cd	Cd	Si	Si	Si	Si	2.982	-0.643	Zn	Zn	Zn	Zn	Ge	HF	HF	3.447	0.215	Ga	Ga	Ga	In	Sc	Sc	Sc	3.921	1.079										

Table S4 (d): 4 types of cations

Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)									
Be	Ba	Sn	Sn	In	In	In	In	0.016	-0.112	Ca	Ba	Ge	Ge	Sc	Sc	Sc	2.643	0.806	Zn	Zn	Si	Ge	Y	Y	Y	Y	3.188	0.782	Sr	Sr	Sr	Sr	Ge	Ti	Ti	HF	3.598	0.135																					
Mg	Ba	Sn	Sn	In	In	In	In	0.070	0.159	Sr	Ba	Ti	Ti	Ga	Ga	Ga	2.644	1.081	Be	Be	Ba	Zn	Ge	Ge	Ge	Ge	3.188	1.113	Be	Be	Zn	Zn	Si	Si	HF	HF	3.598	0.583																					
Be	Sr	Sn	Sn	In	In	In	In	0.126	0.229	Ca	Ca	Ge	Ge	Al	Y	Y	2.644	0.723	Mg	Cd	Cd	Cd	Si	Si	Ge	Ge	3.188	1.300	Zn	Cd	Ti	Ti	Sc	Sc	Sc	Sc	3.598	0.458																					
Ba	Cd	Sn	Sn	In	In	In	In	0.129	0.550	Be	Be	Ge	Zr	In	In	In	2.644	0.623	Zn	Zn	Zn	Cd	Si	Si	Si	Sn	3.188	0.972	Sr	Sr	Ba	Ba	Si	Ti	Ti	Ti	3.599	0.181																					
Cd	Cd	Sn	Sn	Ga	In	In	In	0.153	0.785	Sr	Cd	Cd	Cd	Si	Zr	Zr	2.645	0.649	Zn	Zn	Zn	Zr	Sc	Sc	Sc	Sc	3.189	1.033	Be	Be	HF	HF	Sc	Sc	Sc	Y	3.599	0.114																					
Sr	Cd	Sn	Sn	In	In	In	In	0.155	0.042	Sr	Sr	Ti	HF	Ga	Ga	Ga	2.646	0.722	Be	Be	Be	Ba	Sn	Ti	Ti	Ti	3.189	1.176	Be	Ba	Ba	Ba	Ge	Ge	Zr	Zr	3.599	0.162																					
Mg	Sr	Sn	Sn	In	In	In	In	0.156	0.117	Ba	Ba	HF	HF	Ga	Y	Y	2.646	0.600	Ca	Ca	Ca	Cd	Si	Ti	Ti	Ti	3.189	0.928	Be	Be	Be	Be	Si	Sn	Zr	Zr	3.599	0.056																					
Zn	Cd	Sn	Sn	In	In	In	In	0.202	0.417	Ca	Ba	HF	HF	In	In	Sc	2.646	0.635	Sr	Sr	Ti	Zr	Sc	Sc	Sc	Sc	3.190	0.996	Zn	Zn	Zn	Zn	Ge	Ti	Ti	Zr	3.600	0.300																					
Cd	Cd	Sn	Sn	Al	In	In	In	0.212	0.652	Ca	Cd	Cd	Cd	Si	Si	Si	Sn	2.647	0.710	Zn	Zn	HF	HF	Ga	Ga	Sc	3.190	1.166	Mg	Mg	Mg	Cd	Zr	Zr	HF	HF	3.600	0.350																					
Cd	Cd	Ge	Sn	In	In	In	In	0.236	-0.109	Ba	Ba	Si	Si	Ga	Ga	Sc	2.647	0.695	Sr	Zn	HF	HF	Y	Y	Y	Y	3.190	1.015	Mg	Mg	Ba	Ba	Sn	Ti	Ti	Ti	3.601	0.138																					
Ca	Cd	Sn	Sn	In	In	In	In	0.286	0.216	Mg	Mg	Ge	Ge	Ga	Ga	Sc	2.648	0.696	Be	Ba	Ti	Ti	Sc	Sc	Sc	Sc	3.191	1.022	Be	Be	Ba	Zn	Ge	Ge	Ge	Ti	3.601	0.647																					
Ca	Ba	Sn	Sn	In	In	In	In	0.306	0.467	Sr	Sr	HF	HF	Al	Ga	Ga	2.648	-0.083	Be	Be	Be	Sr	Ti	Ti	Ti	Zr	3.191	1.045	Mg	Ca	Cd	Cd	Si	Si	Si	Si	3.601	0.591																					
Sr	Sr	Sn	Sn	In	In	In	Y	0.340	0.063	Mg	Cd	Cd	Cd	Sn	Sn	HF	HF	2.649	-0.160	Zn	Zn	Si	Sn	Sc	Sc	Sc	Sc	3.191	0.967	Mg	Mg	Mg	Zn	Ge	Ge	HF	HF	3.602	0.450																				
Ca	Sr	Sn	Sn	In	In	In	In	0.340	0.312	Ba	Ba	HF	HF	Al	Al	In	2.649	-0.145	Mg	Mg	Sr	Cd	Ge	Ge	Ge	Ge	3.191	0.870	Be	Be	Ti	Ti	Sc	Y	Y	Y	3.602	0.191																					
Cd	Cd	Sn	Sn	Ga	Ga	In	In	0.345	0.106	Ca	Ca	Ca	Zn	Ge	Sn	Sn	2.649	0.044	Ba	Zn	Si	Si	Al	Al	Al	Al	3.192	0.906	Ca	Ca	Sr	Sr	Zr	Zr	Zr	HF	3.602	0.262																					
Sr	Ba	Sn	Sn	In	In	In	In	0.360	-0.084	Zn	Zn	Ti	Ti	Al	Al	In	In	2.649	-0.190	Be	Be	Cd	Cd	Zr	HF	HF	HF	3.192	1.072	Mg	Sr	Sr	Sr	Ge	Ge	HF	HF	3.602	0.274																				
Ba	Zn	Sn	Sn	In	In	In	In	0.366	0.032	Ba	Cd	Cd	Cd	Si	Si	Si	Ge	2.649	-0.253	Sr	Ba	Ba	Ba	Ge	Ge	Sn	Sn	3.192	0.791	Ga	In	Sc	Sc	Sc	Y	Y	Y	3.602	0.396																				
Ba	Ba	Sn	Sn	In	In	In	Y	0.372	0.351	Ba	Ba	Ge	Ge	Sc	Sc	Y	2.652	0.233	Sr	Ba	Zn	Zn	Si	Si	Si	Si	3.192	0.820	Mg	Mg	Mg	Ba	Si	Zr	Zr	Zr	3.602	0.436																					
Sr	Zn	Sn	Sn	In	In	In	In	0.410	0.562	Sr	Cd	Ge	Ge	Y	Y	Y	2.652	0.002	Zn	Zn	Zn	Cd	Ti	Zr	Zr	Zr	3.192	1.029	Be	Ba	Ba	Ba	Ge	Ge	HF	HF	3.603	0.331																					
Cd	Cd	Sn	Sn	In	In	In	Y	0.412	-0.191	Cd	Cd	Si	Sn	Al	Al	Al	2.653	-0.085	Be	Be	Cd	Cd	Ti	Ti	Ti	HF	3.192	0.856	Sr	Sr	Sr	Sr	Ge	Ti	Ti	Zr	3.604	0.206																					
Mg	Cd	Sn	Sn	In	In	In	In	0.452	0.153	Sr	Sr	Ti	Ti	Ge	Ga	Ga	2.653	0.340	Mg	Mg	HF	HF	Al	Al	In	In	3.193	0.904	Be	Ba	Ba	Ba	Ti	Zr	Zr	Zr	3.604	0.407																					
Sr	Sr	Sn	Sn	Ga	In	In	In	0.493	0.380	Ca	Ba	Ba	Cd	Ge	Ge	Ge	2.653	-0.068	Ca	Ca	Zn	Zn	Si	Si	Si	Zr	3.194	0.966	Ca	Ca	Sr	Sr	Sn	Ti	Ti	Ti	3.604	0.551																					
Cd	Cd	Si	Sn	In	In	In	In	0.497	0.013	Be	Cd	Sn	Sn	Al	Al	Al	2.653	-0.105	Cd	Cd	Ge	Ti	Y	Al	Al	Al	3.194	0.689	Zn	Zn	Zn	Zn	Si	Ti	Zr	HF	3.604	0.383																					
Sr	Sr	Sn	Sn	In	In	In	Sc	0.498	0.237	Sr	Sr	Sn	HF	Y	Y	Y	2.653	0.354	Mg	Ba	Ti	Ti	Y	Y	Y	Y	3.194	0.858	Ca	Ba	Ba	Be	Si	Ge	Ge	Ge	3.605	0.575																					
Mg	Ca	Sn	Sn	In	In	In	In	0.498	0.028	Cd	Cd	Si	Si	In	Y	Y	2.654	-0.085	Ba	Ba	Ba	Cd	Zr	Zr	Zr	HF	3.195	0.955	Be	Be	Be	Be	Sn	Sn	Ti	HF	3.605	0.622																					
Ca	Ca	Sn	Sn	In	In	In	Y	0.499	-0.320	Ba	Ba	Zr	Zr	Ga	Ga	Ga	2.654	-0.110	Ca	Ca	Ca	Cd	Zr	Zr	HF	HF	3.195	0.658	Ca	Ca	Si	Ti	Y	Y	Y	Y	3.607	0.143																					
Sr	Sr	Sn	Sn	Al	In	In	Y	0.514	-0.019	Ba	Ba	Zn	Ti	Ti	Ga	Ga	2.654	-0.113	Be	Mg	Mg	Ca	Sn	Sn	Sn	Sn	3.195	0.849	Be	Zn	Zn	Cd	Ti	Ti	Ti	Ti	3.607	0.205																					
Ba	Ba	Sn	Sn	In	In	In	Sc	0.520	0.208	Be	Ba	HF	HF	Ga	Ga	Ga	2.655	-0.048	Ca	Ba	Ba	Ba	Si	Si	Sn	Sn	3.195	1.125	Be	Sr	Sr	Sr	Sn	Ti	Ti	Ti	3.607	0.150																					
Be	Ca	Sn	Sn	In	In	In	In	0.524	-0.146	Sr	Sr	Ti	Ti	Al	Ga	Ga	2.656	-0.115	Ca	Ca	Ca	Cd	Ge	Ti	Ti	Ti	3.195	0.945	Sr	Sr	Ba	Ba	Si	Si	Ti	Ti	3.607	0.419																					
Ba	Ba	Sn	Sn	Ga	In	In	In	0.539	0.079	Sr	Ba	Ba	Cd	Ge	Ge	Ge	2.657	0.275	Mg	Ca	Zr	Zr	Ga	Ga	Ga	Ga	3.195	0.940	Mg	Mg	Sr	Sr	Ti	Ti	HF	HF	3.608	0.378																					
Ba	Ba	Sn	Sn	Al	In	In	In	0.548	-0.136	Ba	Zn	Ge	Ge	Y	Y	Y	2.657	0.131	Be	Be	Be	Zn	Ge	Ge	HF	HF	3.196	1.082	Be	Be	Ba	Ba	Ge	Ge	Ti	Ti	3.608	0.274																					
Be	Cd	Sn	Sn	In	In	In	In	0.555	-0.455	Ca	Ca	Si	Si	Al	In	In	2.657	0.074	Be	Be	Be	Ca	Si	Si	Sn	Sn	3.196	1.023	Ca	Ca	Ca	Sr	Ti	Zr	Zr	Zr	3.608	0.585																					
Ba	Cd	Ge	Ge	In	In	In	In	0.569	-0.252	Cd	Cd	Ge	Ge	Sc	Y	Y	2.657	0.358	Be	Be	Be	Ba	Ge	Ge	Ge	Zr	3.196	1.044	Sr	Sr	Sr	Ba	Si	Si	Ti	Ti	3.608	0.528																					
Cd	Cd	Sn	Sn	In	In	In	Sc	0.569	-0.463	Ba	Ba	Ba	Zn	Sn	Sn	HF	HF	2.657	0.034	Mg	Sr	HF	HF	Sc	Sc	Sc	Sc	3.197	1.010	Ca	Ca	Ca	Sr	Ti	HF	HF	HF	3.608	0.292																				
Sr	Sr	Ge	Sn	In	In	In	In	0.577	-0.516	Be	Mg	Sr	Sr	Sn	Sn	Sn	2.658	0.058	Zn	Zn	Zn	Cd	Si	Zr	Zr	Zr	3.197	0.849	Mg	Ca	Sr	Sr	Ge	Ge	Ge	Ge	3.609	0.317																					
Ca	Zn	Sn	Sn	In	In	In	In	0.579	0.458	Sr	Zn	Zn	Zn	Sn	Sn	Ti	2.659	0.367	Ca	Zn	Zn	Zn	Ti	Ti	Ti	Zr	3.198	1.007	Ca	Sr	Ba	Ba	Ge	Ge	Ge																								

Zn	Zn	Sn	Sn	In	In	Y	Y	1.082	0.334	Zn	Zn	Hf	Hf	Ga	Y	Y	Y	2.696	0.881	Be	Be	Sr	Sr	Ge	Ge	Ge	Zr	3.221	0.418	Mg	Ba	Ba	Ba	Si	Si	Si	Ge	3.631	1.047	
Cd	Cd	Sn	Sn	In	In	Sc	Sc	1.083	0.630	Cd	Cd	Cd	Cd	Si	Si	Si	Zr	2.696	1.098	Be	Be	Mg	Cd	Hf	Hf	Hf	Hf	3.221	0.343	Mg	Sr	Sr	Sr	Ti	Ti	Hf	Hf	3.631	0.929	
Ba	Ba	Sn	Sn	Al	Al	Ga	Ga	1.084	0.105	Zn	Zn	Cd	Zr	Ti	Ga	Ga	Ga	2.696	1.014	Ba	Ba	Cd	Zr	Sc	Sc	Sc	Sc	3.221	0.618	Mg	Mg	Zn	Zn	Ge	Ge	Ti	Ti	3.631	0.786	
Zn	Zn	Sn	Sn	In	In	In	Sc	1.085	0.001	Ca	Ca	Zn	Zn	Sn	Sn	Ti	Ti	2.697	1.099	Zn	Zn	Zn	Zn	Si	Ge	Ge	Hf	3.222	0.405	Mg	Mg	Ca	Ba	Hf	Hf	Hf	Hf	3.631	1.186	
Sr	Sr	Ge	Ge	Al	In	In	In	1.091	-0.066	Ca	Ca	Ca	Cd	Zr	Hf	Hf	Y	2.697	1.043	Ca	Ca	Ca	Cd	Zr	Hf	Hf	Hf	3.222	0.378	Be	Ba	Ba	Ba	Si	Zr	Zr	Zr	3.632	0.966	
Cd	Cd	Sn	Sn	In	In	In	Sc	1.095	-0.068	Sr	Sr	Sr	Cd	Ge	Hf	Hf	Hf	2.697	0.800	Mg	Mg	Mg	Ba	Cd	Ti	Ti	Ti	3.222	0.797	Mg	Mg	Mg	Cd	Sn	Ti	Ti	Ti	3.632	0.841	
Cd	Cd	Sn	Zr	In	In	In	In	1.098	0.270	Cd	Cd	Sn	Zr	Al	Al	Ga	Ga	2.698	1.052	Sr	Ba	Ba	Ba	Si	Si	Sn	Sn	3.222	0.343	Mg	Cd	Si	Si	Y	Y	Y	Y	3.633	0.416	
Be	Ca	Ge	Ge	In	In	In	In	1.100	0.199	Be	Be	Ge	Ge	In	Y	Y	Y	2.698	1.033	Mg	Mg	Ge	Ge	Ga	Sc	Sc	Sc	3.222	0.352	Be	Be	Ba	Ba	Si	Si	Ti	Ti	3.633	0.455	
Cd	Cd	Sn	Ti	In	In	In	In	1.101	0.207	Ba	Ba	Ba	Zr	Zr	Al	Al	Ga	2.698	0.759	Cd	Cd	Ti	Ti	Zr	Al	Al	Y	3.222	0.825	Ga	Ga	Ga	In	Sc	Sc	Sc	Y	3.633	0.656	
Cd	Cd	Ge	Ge	In	In	In	Sc	1.105	0.288	Ba	Ba	Sn	Ti	Sc	Sc	Sc	Sc	2.698	1.041	Be	Be	Sn	Sn	Al	Al	Al	Y	3.223	0.330	Mg	Mg	Zr	Sr	Ti	Hf	Hf	Hf	3.633	0.381	
Sr	Sr	Sn	Sn	Al	Al	Al	Ga	1.112	0.303	Sr	Sr	Cd	Cd	Ti	Ti	Hf	Hf	2.699	1.139	Ca	Ca	Ca	Ba	Ge	Ge	Sn	Sn	3.223	0.348	Ca	Zn	Zn	Si	Si	Si	Ge	3.633	0.426		
Ba	Ba	Ge	Ge	Al	In	In	In	1.114	0.617	Ba	Ba	Ba	Zn	Zn	Si	Si	Si	Hf	2.699	1.257	Ca	Ba	Zn	Zn	Ti	Ti	Ti	3.223	0.710	Mg	Zn	Zn	Zn	Ti	Ti	Hf	Hf	3.633	0.714	
Zn	Cd	Sn	Sn	Ga	Ga	Ga	Ga	1.123	0.060	Ba	Ba	Ba	Ba	Cd	Ti	Ti	Ti	Hf	2.699	1.384	Be	Be	Cd	Cd	Ti	Ti	Ti	Zr	3.223	0.847	Ca	Sr	Sr	Sr	Ge	Ge	Ti	Ti	3.634	1.256
Ca	Ca	Sn	Sn	Ga	Ga	Ga	Sc	1.131	-0.047	Sr	Sr	Zr	Zr	Al	Ga	Ga	Ga	2.699	1.074	Ba	Zn	Hf	Hf	Al	Al	Al	Al	3.224	0.845	Sr	Sr	Ba	Ba	Si	Ge	Ge	Ge	3.634	1.144	
Sr	Zn	Sn	Sn	Ga	Ga	Ga	Ga	1.136	-0.056	Mg	Cd	Si	Si	Ga	Ga	Ga	Ga	2.700	1.056	Cd	Cd	Ti	Ti	Ga	Sc	Sc	Sc	3.224	0.866	Sr	Ba	Ba	Ba	Si	Ge	Ge	Ge	3.634	1.150	
Cd	Cd	Ge	Sn	Ga	Ga	Ga	Ga	1.145	0.055	Sr	Sr	Zn	Zn	Ge	Ge	Ge	Ti	2.700	1.335	Be	Be	Mg	Sn	Sn	Sn	Sn	Zr	3.224	0.797	Mg	Mg	Sr	Sr	Ge	Ge	Ge	Zr	3.634	0.523	
Ba	Ba	Sn	Sn	Al	Al	Al	Y	1.145	0.053	Be	Be	Sr	Sr	Si	Si	Si	Sn	2.701	1.061	Be	Be	Si	Sn	Ga	Ga	Ga	Zr	3.224	0.819	Mg	Sr	Sr	Sr	Si	Si	Ge	Ge	3.634	0.643	
Ba	Ba	Ge	Sn	Ga	Ga	Ga	Ga	1.146	0.300	Sr	Sr	Ba	Cd	Cd	Si	Si	Si	2.701	1.016	Be	Mg	Cd	Cd	Ge	Ge	Ge	Ge	3.224	0.890	Sr	Sr	Si	Si	Ti	Ti	Zr	Zr	3.635	0.940	
Sr	Sr	Ge	Sn	Ga	Ga	Ga	Ga	1.150	-0.422	Sr	Sr	Ba	Cd	Cd	Ge	Ge	Ge	2.702	1.324	Ca	Ca	Ca	Ba	Sn	Sn	Hf	Hf	3.224	0.785	Mg	Mg	Mg	Sr	Ge	Zr	Zr	Zr	3.635	0.519	
Mg	Mg	Sn	Sn	In	In	In	Y	1.161	-0.443	Mg	Mg	Ge	Ge	Ge	Y	Y	Y	2.703	0.917	Ba	Ba	Ba	Ba	Ge	Sn	Hf	Hf	3.225	0.813	Mg	Mg	Hf	Hf	Ca	Sc	Sc	Sc	3.636	0.620	
Ca	Ca	Sn	Al	Al	Al	In	In	1.165	-0.185	Sr	Sr	Sr	Cd	Ge	Ge	Ti	Ti	2.703	0.828	Be	Be	Si	Si	In	In	In	Sc	3.225	0.792	Mg	Mg	Sr	Sr	Sn	Sn	Ti	Ti	3.636	0.991	
Zn	Zn	Sn	Sn	Al	Al	Al	In	1.174	-0.360	Ca	Ba	Ti	Zr	Ga	Ga	Ga	Ga	2.703	0.866	Zn	Zn	Ti	Hf	Y	Y	Y	Y	3.225	0.635	Ca	Ca	Zn	Zr	Zr	Hf	Hf	3.636	0.574		
Ba	Ba	Sn	Sn	Al	Al	Al	In	1.174	0.264	Zn	Zn	Zr	Zr	In	Y	Y	Y	2.704	0.912	Mg	Ca	Hf	Hf	Y	Y	Y	Y	3.225	0.590	Zn	Zn	Zn	Cd	Si	Si	Si	Ge	3.636	0.865	
Cd	Cd	Sn	Sn	Al	Al	Ga	Ga	1.175	0.046	Ca	Ca	Si	Si	Al	Ga	Ga	Ga	2.704	0.802	Ca	Ca	Si	Ge	Sc	Sc	Sc	Sc	3.225	0.819	Ca	Ca	Ba	Ba	Si	Ge	Ge	Ge	3.636	1.151	
Sr	Sr	Si	Ge	In	In	In	In	1.176	-0.061	Sr	Ba	Ge	Ge	Y	Y	Y	Y	2.704	0.851	Ca	Ca	Ca	Zn	Ge	Ge	Zr	Zr	3.226	0.634	Ca	Ca	Ca	Sr	Ti	Ti	Ti	Hf	3.636	0.548	
Cd	Cd	Sn	Sn	Ga	Ga	Ga	Sc	1.185	-0.173	Ca	Ca	Hf	Hf	Ga	Ga	Y	Y	2.704	0.891	Be	Be	Zn	Cd	Zr	Zr	Zr	Zr	3.227	0.584	Be	Be	Ca	Ca	Zr	Hf	Hf	Hf	3.636	0.839	
Sr	Sr	Sn	Sn	Ga	Ga	Ga	Y	1.191	-0.178	Al	Ga	Ca	Zn	Ga	In	In	Y	2.704	0.877	Ca	Zn	Zn	Zn	Ge	Zr	Zr	Zr	3.227	0.862	Mg	Sr	Al	Sr	Ti	Ti	Zr	Zr	3.637	1.219	
Sr	Sr	Sn	Sn	Al	Al	Al	Y	1.198	0.225	Be	Mg	Mg	Zn	Sn	Sn	Sn	Sn	2.705	0.880	Mg	Mg	Si	Si	In	Y	Y	Y	3.227	0.839	Al	Al	Al	In	In	Sc	Sc	Y	3.637	0.255	
Cd	Cd	Ge	Ge	Ga	Ga	Ga	In	1.208	0.090	Ba	Ba	Ba	Cd	Ti	Hf	Hf	Hf	2.705	0.041	Be	Be	Hf	Hf	In	In	In	Sc	3.227	0.831	Be	Be	Zr	Zr	Ga	Ga	Ga	In	3.637	0.311	
Ba	Ba	Si	Ge	In	In	In	In	1.209	0.013	Ca	Ca	Zr	Zr	In	In	Sc	Sc	2.706	-0.032	Mg	Mg	Mg	Sr	Sn	Sn	Sn	Ti	3.227	0.139	Ca	Ba	Ba	Ba	Si	Si	Ti	Ti	3.637	0.446	
Zn	Zn	Ge	Ge	Ga	Ga	Ga	In	1.211	0.032	Ba	Ba	Ba	Cd	Ti	Zr	Zr	Zr	2.706	-0.017	Mg	Mg	Cd	Cd	Si	Si	Si	Sn	3.227	-0.016	Be	Be	Mg	Sr	Ge	Ge	Ge	Ge	3.638	1.443	
Sr	Sr	Sn	Sn	Al	Al	Al	In	1.211	0.321	Ba	Ba	Ba	Cd	Ti	Ti	Ti	Zr	2.707	0.157	Zn	Zn	Zn	Si	Al	Al	Al	Al	3.228	0.008	Mg	Mg	Sr	Zn	Zr	Zr	Zr	Zr	3.638	1.330	
Cd	Cd	Ge	Hf	In	In	In	Y	1.225	0.239	Cd	Cd	Cd	Cd	Ge	Sn	Ti	Ti	2.707	-0.063	Ca	Ca	Ba	Ba	Sn	Sn	Zr	Zr	3.228	0.436	Sr	Sr	Sr	Ba	Si	Ge	Ge	Ge	3.638	1.216	
Ba	Ba	Sn	Sn	Ga	Ga	Ga	Y	1.227	0.271	Ca	Ca	Ba	Zn	Zn	Ge	Ge	Ge	2.707	-0.128	Ca	Sr	Sr	Sr	Sn	Sn	Zr	Zr	3.228	0.060	Be	Ca	Ca	Sr	Ge	Ge	Ge	Ge	3.639	1.565	
Ca	Ca	Ge	Ge	Ga	Ga	In	In	1.237	0.269	Ba	Ba	Ba	Ge	Ge	Ge	Zr	2.708	0.357	Be	Be	Be	Be	Ge	Sn	Sn	Hf	3.228	-0.047	Ca	Ca	Ca	Sr	Si	Hf	Hf	Hf	3.639	1.367		
Zn	Zn	Sn	Sn	Ga	Ga	Ga	In	1.240	0.307	Ca	Ca	Ti	Ti	Ga	Ga	In	In	2.708	0.143	Be	Be	Be	Mg	Ge	Sn	Sn	Sn	3.228	0.424	Be	Be	Be	Zn	Ge	Ti	Ti	Ti	3.640	1.267	
Ca	Ca	Sn	Sn	Al	Al	Ga	Ga	1.243	0.603	Ba	Ba	Ti	Ti	Al	Al	Ga	Ga	2.710	0.054	Sr	Zn	Cd	Cd	Si	Si	Si	Si	3.228	0.033	Be	Be	Ca	Ca	Ge	Ge	Ge	Hf	3.640	0.843	
Ba	Ba	Sn	Sn	Ga	Ga	Ga	Sc	1.246	0.249	Ca	Cd	Cd	Cd	Si	Si	Ge	Ge	2.710	0.447	Ba	Ba	Ti	Ti	Sc	Sc	Sc	Y	3.228	-0.041	Mg	Sr	Sr	Sr	Ge	Hf	Hf	Hf	3.640	0.921	
Sr	Sr	Sn	Sn	Ga	Ga	Ga	Sc	1.250	0.124	Ba	Ba	Ba	Zr	Zr	Al	Al	In	2.711	0.068	Mg	Mg	Ti	Ti	In	Y	Y	Y	3.228	0.650	Be	Be	Be	Sr	Si	Si	Zr	Zr	3.641	1.099	
Cd	Cd	Ge	Ge	Al	Al	In	In	1.254	0.048	Mg	Mg	Mg	Zn	Zn	Sn	Sn	Zr	2.711	0.033	Sr	Ba	Ti	Ti	Y	Y	Y	Y	3.229	0.001	Mg	Sr	Sr	Sr	Ge	Zr	Zr	Zr	3.641	0.752	
Ba	Ba	Ge	Ge	Ga	Ga	Ga	Y	1.260	0.044	Mg	Mg	Mg	Cd	Ge	Ge	Sn	Sn	2.711	0.457	Sr	Sr	Sr	Zn	Si	Si	Ti	Ti	3.230	-0.067	Be	Ba	Ba	Ba	Si	Ti	Ti	Ti	3.641	0.870	
Ca	Ca	Ge	Ge	In	In	In	Sc	1.262	0.365	Sr	Sr	Sr	Cd	Sn	Zr	Zr	Zr	2.711	0.050	Ca	Ca	Hf	Hf	Sc	Sc	Y	Y	3.230	0.685	Be	Be	Ba	Cd	Si	Si	Si	Si	3.642	1.144	
Mg	Mg	Sn	Sn	Ga	Ga	In	In	1.263	0.285	Be	Ba	Ba	Zn	Ge	Ge	Ge	Ge	2.711	0.028	Mg	Mg	Cd	Cd	Ge	Ge	Ti	Ti	3.230	-0.005	Mg	Mg	Mg	Cd	Si	Si	Si	Sn	3.642	1.622	
Ba	Ba	Cd	Si	Si	In	In	In	1.273	0.289	Be	Be	Be	Sr	Ge	Ge	Sn	Sn	2.711	0.229	Mg	Mg	Mg	Sr	Si	Si	Sn	Sn	3.230	-0.070	Be	Ba	Ba	Ba	Si	Hf	Hf	Hf	3.642	1.526	
Sr	Sr	Ge	Ge	Ga	Ga	In	In	1.274	0.323	Sr	Sr	Sr	Cd	Si	Hf	Hf	Hf	2.712	0.077	Ca	Ca	Zn	Cd	Si	Si	Hf	Hf	3.230	0.500	Mg	Mg	Sr	Zn	Hf	Hf	Hf	Hf	3.643	1.529	
Cd	Cd	Ge	Zr	In	In	In																																		

Be	Ba	Ba	Cd	Sn	Sn	Sn	1.484	-0.646	Ba	Ba	Ba	Cd	Si	Ti	Ti	Ti	2.745	-0.095	Be	Be	Be	Zn	Sn	Sn	Ti	Ti	3.254	0.352	Be	Be	Ca	Ti	Hf	Hf	Hf	3.670	0.839		
Ca	Ba	Ge	Ge	Ga	Ga	Ga	1.485	-0.671	Ca	Ca	Ti	Ti	Ga	Ga	Ga	Y	2.745	0.283	Mg	Mg	Mg	Cd	Sn	Hf	Hf	Hf	3.254	0.589	Sr	Sr	Sr	Ba	Si	Si	Ge	Ge	3.670	0.765	
Cd	Cd	Sn	Sn	In	Y	Y	1.485	-0.793	Ca	Cd	Cd	Cd	Ti	Ti	Ti	Zr	2.746	-0.021	Sr	Sr	Sr	Zr	Ti	Ti	Ti	Zr	3.255	0.589	Be	Mg	Hf	Hf	Ca	Ge	Ga	Ga	3.670	0.706	
Ca	Ca	Ge	Ge	Ga	Ga	In	1.486	-0.650	Be	Be	Ba	Cd	Hf	Hf	Hf	Y	2.746	-0.053	Ca	Ca	Zr	Hf	Y	Y	Y	Y	3.255	0.794	Ca	Ca	Ba	Ba	Ge	Ge	Hf	3.670	0.683		
Mg	Mg	Sn	Sn	Sn	Ga	Ga	In	1.487	-0.668	Cd	Cd	Ti	Ti	Al	Al	Ga	2.746	0.448	Ca	Zn	Zn	Zn	Zr	Zr	Hf	Hf	3.255	0.827	Mg	Sr	Zn	Zn	Ti	Ti	Ti	3.671	0.657		
Ca	Cd	Si	Si	In	In	In	1.487	-0.789	Be	Be	Be	Cd	Sn	Hf	Hf	Hf	2.746	-0.054	Zn	Zn	Zr	Zr	Ga	Ga	Ga	Sc	3.255	-0.068	Mg	Mg	Mg	Sr	Zr	Zr	Hf	Hf	3.671	0.647	
Ba	Ba	Ge	Ge	Al	Ga	Ga	1.488	-0.387	Ba	Ba	Ba	Zr	Zr	Ga	Ga	Sc	2.746	-0.053	Be	Be	Ba	Ba	Zr	Zr	Ti	Ti	3.255	0.115	Mg	Mg	Sn	Zr	Al	Al	Al	3.671	0.696		
Ba	Ba	Ge	Ge	In	In	Sc	1.489	-0.399	Ba	Ti	Ti	Ti	In	Y	Y	Y	2.747	0.474	Zn	Zn	Sn	Zr	Zr	Al	Al	Al	3.255	0.474	Mg	Mg	Mg	Sr	Ge	Ge	Ge	Zr	3.671	0.657	
Ba	Ba	Sn	Sn	In	Sc	Sc	1.492	-0.770	Ca	Ca	Hf	Hf	In	Y	Y	Y	2.747	-0.061	Zn	Zn	Zr	Zr	Al	Al	Al	In	3.255	0.233	Ca	Zn	Si	Si	Al	Al	Al	3.672	0.653		
Sr	Sr	Ge	Ge	In	In	Sc	1.496	-0.385	Mg	Mg	Sn	Sn	Sc	Y	Y	Y	2.748	-0.053	Sr	Sr	Sr	Zr	Ti	Ti	Hf	Hf	3.255	0.435	Ca	Ca	Ca	Zn	Ge	Ti	Ti	3.672	0.702		
Ca	Ca	Sn	Sn	Al	Al	Al	Y	1.503	-0.384	Be	Mg	Sn	Sn	Y	Y	Y	2.748	0.341	Zn	Zn	Zn	Cd	Sn	Ti	Ti	Ti	3.255	0.472	Mg	Mg	Sr	Sr	Ge	Zr	Zr	3.672	0.708		
Mg	Ba	Si	Si	In	In	In	1.507	-0.765	Be	Be	Be	Be	Be	Si	Si	Sn	2.748	0.104	Be	Be	Ba	Ba	Ti	Ti	Zr	Zr	3.256	-0.375	Ca	Ca	Ba	Si	Si	Ge	Ge	3.672	0.656		
Sr	Ba	Sn	Sn	Al	Al	Al	1.508	-0.388	Be	Be	Ba	Cd	Zr	Zr	Zr	Zr	2.749	0.070	Sr	Sr	Ba	Ba	Zr	Zr	Zr	Zr	3.256	-0.211	Be	Be	Be	Cd	Si	Si	Ti	3.672	0.666		
Zn	Zn	Sn	Hf	In	In	In	1.512	-0.382	Ca	Cd	Cd	Cd	Ge	Ge	Ti	Ti	2.749	0.318	Ca	Ca	Zn	Zn	Ti	Ti	Ti	Zr	3.256	0.085	Mg	Mg	Ti	Hf	Y	Y	Y	3.673	0.586		
Mg	Sr	Cd	Cd	Sn	Sn	Sn	1.514	-0.763	Zn	Zn	Ti	Ti	Ga	Ga	Y	Y	2.750	0.166	Ca	Zn	Zn	Zn	Ti	Ti	Hf	Hf	3.256	-0.179	Ca	Ca	Si	Ti	Sc	Sc	Sc	3.673	0.574		
Sr	Sr	Cd	Cd	Ge	Ge	Sn	1.516	-0.441	Cd	Cd	Zr	Zr	Zr	Al	Y	Y	2.751	0.129	Sr	Cd	Si	Si	Y	Y	Y	Y	3.256	0.030	Sr	Sr	Sr	Ba	Ge	Ge	Hf	3.673	0.713		
Sr	Sr	Ge	Ge	Al	Ga	Ga	1.517	-0.479	Be	Be	Be	Cd	Si	Si	Sn	Sn	2.752	0.466	Mg	Mg	Ge	Ti	Ga	Ga	Ga	Ga	3.257	0.071	Zn	Zn	Si	Si	Al	Al	Ga	3.674	0.590		
Ca	Ca	Ge	Ge	Ga	Ga	Ga	Y	1.519	-0.819	Cd	Cd	Hf	Hf	Al	Al	In	2.752	0.117	Be	Be	Si	Si	Ga	Y	Y	Y	3.257	-0.137	Mg	Ca	Ca	Si	Si	Sn	Sn	3.674	0.576		
Sr	Zn	Zn	Cd	Sn	Sn	Sn	1.520	-0.440	Sr	Zn	Ge	Ge	Y	Y	Y	Y	2.752	0.132	Ba	Ba	Ba	Ba	Si	Sn	Hf	Hf	3.257	0.035	Be	Be	Sr	Sr	Ge	Ge	Hf	3.676	0.630		
Ba	Zn	Ge	Ge	Ga	Ga	Ga	1.524	-0.480	Ca	Ca	Si	Zr	Ga	Ga	Ga	2.752	0.489	Be	Cd	Cd	Cd	Sn	Sn	Hf	Hf	3.258	0.362	Be	Sr	Sr	Sr	Ge	Zr	Zr	3.676	0.689			
Sr	Sr	Sn	Sn	In	Sc	Sc	1.525	-0.826	Ca	Cd	Hf	Hf	Ga	Ga	Ga	2.753	0.107	Be	Sr	Ba	Ba	Ge	Ge	Ge	Ge	3.258	0.201	Mg	Zn	Zn	Zn	Ti	Ti	Zr	Zr	3.677	0.734		
Be	Sr	Si	Si	In	In	In	1.525	-0.237	Sr	Zn	Ti	Ti	Ga	Ga	Ga	2.753	0.132	Cd	Cd	Zr	Zr	Al	Al	Al	Sc	3.259	0.475	Mg	Mg	Mg	Sr	Ti	Hf	Hf	Hf	3.677	0.658		
Ba	Cd	Cd	Cd	Ge	Ge	Sn	1.528	-0.242	Be	Sr	Sr	Sr	Sn	Sn	Sn	Hf	2.753	0.358	Ca	Ca	Zr	Zr	Al	Al	Al	Sc	3.259	0.523	Mg	Mg	Zn	Zn	Ti	Ti	Zr	Zr	3.677	0.690	
Be	Cd	Cd	Cd	Ge	Ge	Ga	1.529	-0.786	Sr	Sr	Sr	Zr	Zr	Al	Al	Al	Y	2.753	0.533	Ca	Zn	Zn	Zn	Si	Hf	Hf	3.259	0.383	Mg	Mg	Mg	Zn	Sn	Sn	Ti	Ti	3.677	0.753	
Zn	Zn	Sn	Sn	Ga	Ga	Ga	Y	1.530	-0.359	Sr	Ba	Ba	Cd	Ti	Ti	Ti	2.754	0.490	Ba	Ba	Si	Ti	Sc	Sc	Sc	Sc	3.259	0.563	Be	Be	Ca	Ca	Sn	Hf	Hf	Hf	3.678	0.517	
Cd	Cd	Si	Hf	In	In	In	1.530	-0.371	Sr	Zn	Hf	Hf	Ga	Ga	Ga	2.754	0.483	Sr	Sr	Sr	Zn	Ti	Zr	Zr	Zr	Zr	3.259	0.914	Mg	Mg	Si	Si	Al	Y	Y	Y	3.678	0.556	
Ba	Ba	Sn	Sn	In	Y	Y	Y	1.531	-0.619	Mg	Sr	Mg	Sn	Sn	Sn	Sn	2.754	0.493	Be	Ba	Ba	Ba	Sn	Sn	Sn	Ti	3.259	0.642	Be	Ca	Ba	Ba	Hf	Hf	Hf	Hf	3.678	0.603	
Sr	Sr	Sn	Sn	In	Y	Y	Y	1.531	-0.372	Mg	Mg	Mg	Zn	Zn	Ge	Ge	Sn	2.754	0.489	Be	Be	Be	Ba	Ge	Ge	Ge	Ti	3.260	0.774	Be	Ba	Ba	Ba	Ti	Ti	Ti	Zr	3.679	0.820
Ca	Ca	Ge	Ge	In	Y	Y	Y	1.532	-0.359	Ca	Sr	Sr	Cd	Ge	Ge	Ge	2.755	0.503	Sr	Ba	Ba	Zr	Hf	Hf	Hf	Hf	3.260	0.799	Be	Be	Be	Zn	Ge	Zr	Ti	Ti	3.679	0.745	
Sr	Zn	Si	Si	In	In	In	1.533	-0.619	Be	Ba	Zr	Zr	Y	Y	Y	Y	2.756	0.482	Sr	Zn	Zr	Zr	Y	Y	Y	Y	3.261	-0.102	Mg	Mg	Zn	Zn	Si	Zr	Zr	Zr	3.679	0.645	
Ba	Cd	Cd	Cd	Sn	Sn	Sn	Hf	-0.370	Ba	Ba	Zr	Zr	In	Sc	Sc	Sc	2.756	0.488	Be	Be	Be	Be	Si	Sn	Sn	Hf	3.261	0.056	Zn	Zn	Ti	Ti	Al	Sc	Sc	Sc	3.681	0.920	
Be	Sr	Cd	Cd	Sn	Sn	Sn	1.540	-0.357	Ba	Ba	Si	Hf	Al	Al	Al	Al	2.756	0.417	Ca	Ca	Zn	Cd	Si	Si	Si	Si	3.261	0.364	Mg	Mg	Mg	Sr	Zr	Zr	Zr	Hf	3.681	0.730	
Zn	Zn	Sn	Sn	In	Sc	Sc	1.541	-0.619	Ba	Ba	Ba	Cd	Sn	Ti	Ti	Ti	2.757	0.290	Mg	Ca	Zn	Zn	Ge	Ge	Ge	Ge	3.262	0.089	Ca	Ca	Ca	Ca	Sn	Sn	Zr	Hf	3.681	0.671	
Ba	Ba	Cd	Cd	Si	Si	Sn	1.543	-0.444	Mg	Ca	Ba	Ba	Sn	Sn	Sn	Sn	2.758	0.261	Mg	Mg	Mg	Cd	Sn	Sn	Ti	Ti	3.262	0.265	Be	Ba	Zn	Zn	Ti	Ti	Ti	Ti	3.681	0.299	
Mg	Sr	Ge	Ge	Ga	Ga	Ga	1.543	-0.471	Ba	Ba	Ti	Ti	Al	Al	In	2.758	0.441	Ca	Ca	Zn	Zn	Zn	Ti	Zr	Zr	Zr	3.262	0.300	Ca	Sr	Sr	Sr	Ge	Ti	Ti	Ti	3.681	0.270	
Ca	Sr	Ge	Ge	Ga	Ga	Ga	1.544	-0.674	Cd	Cd	Cd	Cd	Si	Ge	Ge	Ti	2.758	0.289	Mg	Mg	Si	Si	Al	Al	In	In	3.262	0.185	Mg	Mg	Mg	Sr	Ge	Ge	Zr	Zr	3.681	0.481	
Cd	Cd	Si	Si	Al	In	In	1.548	-0.445	Ca	Ca	Ge	Ge	Al	Sc	Sc	Sc	2.759	0.260	Be	Be	Be	Ca	Sn	Hf	Hf	Hf	3.262	0.350	Be	Sr	Sr	Sr	Ge	Hf	Hf	Hf	3.681	0.262	
Ca	Ca	Sn	Sn	Al	Al	In	1.553	-0.473	Mg	Mg	Ti	Hf	In	In	In	In	2.759	0.462	Ca	Ca	Si	Si	Al	Al	Al	Sc	3.262	0.676	Sr	Sr	Ba	Ba	Ge	Ge	Ge	Hf	3.681	0.200	
Ca	Cd	Ge	Ge	Al	Ga	Ga	1.556	-0.683	Ba	Ba	Ba	Cd	Zr	Zr	Hf	Hf	2.760	0.443	Be	Be	Ba	Ba	Sn	Hf	Hf	Hf	3.263	0.516	Mg	Mg	Ti	Zr	Ga	Ga	Ga	Ga	3.681	0.512	
Sr	Sr	Ge	Ge	Al	Ga	In	1.556	-0.244	Ca	Ca	Hf	Hf	Ga	Ga	Ga	Y	2.760	0.438	Ca	Ca	Ca	Sr	Ge	Ge	Sn	Ga	3.263	0.749	Mg	Mg	Mg	Sr	Ti	Zr	Zr	Zr	3.682	0.931	
Cd	Cd	Ge	Ge	Al	Ga	Ga	1.558	-0.248	Be	Be	Ge	Ti	In	In	In	In	2.760	-0.201	Zn	Zn	Ti	Ti	Al	Al	Ga	Ga	3.263	0.790	Be	Be	Be	Be	Sn	Zr	Zr	Hf	3.682	0.805	
Ba	Ba	Ge	Ge	Al	Al	In	1.559	-0.653	Sr	Sr	Sr	Cd	Ge	Ge	Ge	Zr	2.760	-0.324	Be	Be	Sr	Zr	Sr	Hf	Hf	Hf	3.263	0.592	Zn	Zn	Ti	Zr	Sc	Sc	Sc	Sc	3.682	0.837	
Ba	Cd	Cd	Cd	Sn	Sn	Sn	Zr	1.561	-0.441	Cd	Cd	Ti	Ti	Ga	Y	Y	Y	2.761	-0.320	Be	Be	Be	Zn	Ge	Ge	Zr	Zr	3.263	0.655	Be	Zn	Zn	Zn	Ge	Sc	Zr	Zr	3.683	0.351
Sr	Sr	Ge	Hf	In	In	In	1.562	-0.468	Sr	Sr	Sr	Cd	Si	Si	Ge	Ge	2.761	0.044	Ba	Ba	Ba	Ba	Sn	Zr	Ge	Hf	3.264	0.813	Mg	Mg	Mg	Sr	Ti	Ti	Ti	Hf	3.683	0.357	
Ca	Ca	Cd	Cd	Si	Sn	Sn	1.564	-0.349	Be	Sr	Sr	Sr	Ge	Sn	Sn	Sn	2.762	-0.317	Be	Be	Be	Zn	Zn	Ge	Ge	Sn	3.264	0.565	Ca	Ca	Ca	Sr	Sn	Ti	Ti	Ti	3.683	0.629	
Zn	Zn	Sn	Zr	In	In	In	1.564	-0.443	Ca	Ca	Ge	Ge	Sc	Sc	Sc	Y	2.762	-0.363	Sr	Sr	Zn	Zn	Zr	Zr	Zr	Hf	3.264	0.560	Mg	Mg	Mg	Sr	Si	Hf	Hf	Hf	3.683	0.350	
Ca	Ca	Sn	Hf	In	In	In	1.571	-0.470	Sr	Sr	Zr	Zr	Ga	Y	Y																								

Ca	Zn	Si	Si	In	In	In	In	1.734	0.809	Sr	Sr	Ti	Ti	In	Y	Y	Y	2.790	0.776	Sr	Sr	Ba	Ba	Sr	Zr	Zr	Zr	3.291	1.169	Mg	Mg	Hf	Hf	Al	Al	Al	Y	3.709	0.574	
Zn	Cd	Cd	Cd	Si	Ga	Sr	Sn	1.734	0.637	Mg	Mg	Mg	Mg	Sn	Al	Al	Al	Ga	0.754	Mg	Mg	Mg	Cd	Ge	Hf	Hf	Hf	3.292	0.943	Mg	Sr	Sr	Sr	Si	Ge	Ge	Zr	3.709	0.729	
Ca	Ca	Ge	Ge	Sn	Ga	Ga	Sc	1.737	0.690	Be	Be	Zn	Zn	Ge	Ge	Sn	Sn	2.791	0.751	Mg	Mg	Mg	Cd	Ge	Ti	Ti	Ti	3.292	0.933	Mg	Sr	Sr	Sr	Si	Ge	Ti	Ti	3.709	0.749	
Zn	Zn	Ge	Sn	Ga	Ga	Ga	Sc	1.741	0.812	Cd	Cd	Si	Si	Ga	Ga	Sc	Sc	2.791	0.405	Be	Ba	Ba	Ba	Sn	Zr	Zr	Zr	3.292	0.938	Ca	Ca	Ca	Ba	Ge	Ti	Ti	Ti	3.710	0.831	
Ca	Ca	Ge	Hf	In	In	In	In	1.741	0.633	Be	Zn	Zn	Zn	Sn	Sn	Sn	Zr	2.791	0.281	Be	Be	Be	Sr	Sn	Ti	Ti	Ti	3.292	0.264	Sr	Ba	Ba	Ba	Ge	Ge	Ge	Hf	3.710	0.828	
Cd	Cd	Sn	Sn	Al	Al	Al	Y	1.742	0.660	Ca	Sr	Hf	Hf	Ga	Ga	Ga	2.792	0.300	Be	Ca	Ca	Ca	Sn	Sn	Ti	Ti	3.293	0.390	Mg	Mg	Hf	Hf	Al	Al	Al	Sc	3.710	0.666		
Ca	Ca	Sn	Sn	Al	Al	Al	Y	1.745	0.809	Be	Be	Be	Zn	Zn	Sn	Sn	Ti	2.793	0.635	Ca	Zn	Zn	Zn	Zr	Hf	Hf	Hf	3.293	0.645	Mg	Mg	Cd	Cd	Si	Si	Si	Ti	3.710	0.594	
Zn	Zn	Ge	Sn	Ga	Ga	Ga	Ga	1.746	0.629	Sr	Sr	Sr	Cd	Ti	Ti	Ti	Hf	2.793	0.282	Be	Be	Zn	Zn	Ge	Hf	Hf	Hf	3.293	0.321	Mg	Mg	Mg	Zn	Sr	Zr	Zr	Zr	3.710	0.682	
Zn	Cd	Cd	Cd	Ge	Sn	Sn	Sn	1.746	0.603	Be	Ca	Ba	Ba	Sn	Sn	Sn	2.794	0.265	Be	Be	Zr	Zr	Al	Al	In	In	3.293	0.360	Mg	Mg	Ba	Ba	Si	Ti	Ti	Ti	3.710	0.667		
Sr	Sr	Ge	Ge	Al	Al	Ga	Ga	1.749	0.672	Zn	Zn	Cd	Cd	Sn	Sn	Ti	Ti	2.794	0.619	Sr	Zn	Zn	Zn	Si	Si	Ti	Ti	3.293	0.373	Ca	Ca	Sr	Sr	Ge	Ti	Ti	Ti	3.710	0.545	
Ca	Ca	Si	Si	Sn	Ga	Ga	Ga	1.751	0.611	Mg	Mg	Ba	Ba	Si	Si	Si	2.794	0.330	Be	Be	Zr	Zr	In	In	In	Sc	3.293	0.538	Zn	Zn	Zn	Cd	Si	Si	Si	Ti	3.711	0.682		
Ba	Ba	Sn	Sn	Al	Sc	Sc	Sc	1.754	0.576	Sr	Sr	Zr	Zr	Al	Al	In	2.794	0.306	Be	Be	Zr	Zr	Sc	Y	Y	Y	3.293	0.679	Be	Be	Mg	Ca	Zr	Zr	Zr	Zr	3.711	0.650		
Zn	Zn	Sn	Sn	In	Y	Y	Y	1.756	0.663	Ge	Be	Hf	Hf	Ga	Y	Y	Y	2.795	0.729	Be	Ca	Ca	Si	Sn	Sn	Sn	3.293	0.858	Mg	Ca	Sr	Sr	Zr	Zr	Zr	Zr	3.712	0.744		
Sr	Cd	Sn	Sn	Al	Al	Al	Al	1.759	0.598	Ga	Ga	In	In	In	Sc	Y	Y	2.795	0.255	Be	Be	Zr	Hf	Y	Y	Y	Y	3.293	0.376	Mg	Mg	Hf	Hf	Al	Al	Ga	Ga	3.713	0.841	
Sr	Sr	Cd	Cd	Sn	Sn	Zr	Zr	1.761	0.621	Zn	Zn	Zn	Zn	Si	Sn	Sn	Ti	2.796	0.285	Mg	Ba	Ba	Ba	Sn	Sn	Ti	Ti	3.293	0.337	Be	Mg	Mg	Ba	Zr	Zr	Zr	Zr	3.714	0.634	
Ca	Ca	Sn	Sn	In	Sc	Sc	Sc	1.762	0.635	Ba	Ba	Ti	Ti	Ga	Ga	Sc	Sc	2.797	0.745	Mg	Sr	Ti	Ti	Y	Y	Y	Y	3.293	0.343	Ca	Sr	Sr	Sr	Si	Si	Ge	Ge	3.714	0.693	
Ca	Ca	Sn	Sn	Ga	Y	Y	Y	1.763	0.549	Sr	Cd	Cd	Cd	Si	Si	Si	Ti	2.797	0.240	Ba	Zn	Zr	Zr	Al	Al	Al	Al	3.294	0.492	Be	Be	Be	Zn	Si	Ti	Ti	Ti	3.714	0.859	
Zn	Zn	Ge	Ti	In	In	In	In	1.768	0.904	Ba	Zn	Zn	Zn	Ge	Hf	Hf	Hf	2.797	0.281	Ca	Ca	Ca	Cd	Si	Si	Zr	Zr	3.294	0.632	Mg	Ba	Ba	Ba	Si	Si	Ti	Ti	3.715	0.495	
Cd	Cd	Si	Ge	Ga	Ga	Ga	Ga	1.769	0.906	Cd	Cd	Cd	Cd	Si	Si	Ge	Hf	2.798	0.700	Be	Be	Sr	Ti	Ti	Ti	Ti	Zr	3.294	0.776	Mg	Mg	Ca	Ba	Ti	Ti	Ti	Ti	3.715	0.521	
Mg	Zn	Sn	Sn	Ga	Ga	Ga	Ga	1.769	0.798	Ba	Ba	Ba	Ba	Sn	Sn	Sn	Zr	2.798	0.470	Mg	Mg	Mg	Cd	Sn	Zr	Zr	Zr	3.295	0.405	Ba	Ba	Ba	Ba	Si	Si	Ge	Zr	3.718	0.626	
Cd	Cd	Ti	Zr	In	In	In	In	1.769	0.769	Mg	Sr	Ti	Ti	Ga	Ga	Ga	Ga	2.798	0.439	Sr	Sr	Sr	Ba	Sn	Hf	Hf	Hf	3.295	0.466	Mg	Mg	Zr	Zr	Ga	Sc	Sc	Sc	3.720	0.923	
Mg	Mg	Sn	Sn	Ga	Ga	Ga	In	1.769	0.908	Be	Be	Be	Ca	Sn	Sn	Sn	Hf	2.798	0.672	Be	Sr	Hf	Hf	Al	Al	Al	Al	3.295	0.488	Mg	Sr	Sr	Sr	Si	Zr	Zr	Zr	3.720	0.932	
Cd	Cd	Ge	Ge	Ga	Ga	Ga	Sc	1.771	0.792	Zn	Zn	Zn	Zn	Ge	Sn	Ti	Ti	2.799	0.532	Sr	Cd	Ti	Ti	Al	Al	Al	Al	3.296	0.572	Be	Be	Ca	Ca	Ge	Hf	Hf	Hf	3.721	0.944	
Ba	Cd	Ti	Ti	In	In	In	In	1.771	0.738	Ca	Zn	Zn	Cd	Ge	Ge	Ge	Ge	2.800	0.500	Be	Be	Cd	Cd	Si	Si	Hf	Hf	3.296	0.701	Sr	Ba	Ba	Ba	Ge	Ge	Ge	Zr	3.721	0.994	
Ba	Ba	Si	Si	Ge	Ga	Ga	Ga	1.772	0.904	Zn	Cd	Cd	Cd	Si	Ge	Ge	Ge	2.800	0.765	Ca	Ca	Zr	Zr	Sc	Y	Y	Y	3.296	0.959	Mg	Mg	Mg	Ba	Si	Ge	Ge	Ge	3.721	0.918	
Be	Cd	Si	Si	In	In	Ga	In	1.772	0.788	Zn	Cd	Cd	Cd	Ge	Ge	Ge	Hf	2.800	0.443	Be	Be	Be	Cd	Cd	Si	Si	Zr	3.296	0.612	Mg	Sr	Sr	Sr	Si	Hf	Hf	Hf	3.722	0.912	
Ba	Ba	Ge	Sn	Al	Al	Al	Al	1.772	0.665	Ba	Ba	Hf	Hf	Ga	Sc	Sc	Sc	2.800	0.482	Cd	Cd	Si	Si	Sc	Sc	Y	Y	3.296	0.607	Ca	Sr	Sr	Sr	Si	Ti	Ti	Ti	3.722	0.865	
Be	Be	Sn	Sn	In	In	Y	Y	1.774	0.745	Be	Be	Cd	Cd	Sn	Zr	Zr	Zr	2.800	0.788	Mg	Mg	Cd	Cd	Ti	Ti	Ti	Ti	Zr	3.296	0.612	Al	In	In	Sc	Sc	Y	Y	Y	3.722	0.804
Cd	Cd	Sn	Sn	In	Sc	Sc	Sc	1.774	0.751	Ca	Ca	Cd	Cd	Si	Si	Si	Ge	2.801	0.424	Be	Ba	Ba	Ba	Sn	Sn	Hf	Hf	3.297	0.681	Mg	Mg	Ca	Sr	Hf	Hf	Hf	Hf	3.722	0.828	
Mg	Mg	Sn	Sn	Ga	Ga	Ga	Y	1.774	0.636	Ca	Sr	Ge	Ge	Y	Y	Y	Y	2.801	0.479	Sr	Sr	Zn	Zn	Zr	Zr	Hf	Hf	3.297	0.815	Be	Be	Sr	Sr	Si	Si	Hf	Hf	3.722	0.839	
Ba	Ba	Zn	Zn	Si	Sn	Sn	Sn	1.774	0.735	Mg	Mg	Ge	Ge	Ga	Sc	Sc	2.801	0.735	Sr	Ba	Ba	Ba	Ti	Ti	Zr	Zr	Zr	3.297	0.996	Ca	Ca	Sr	Sr	Ge	Ge	Ge	Hf	3.722	0.751	
Ca	Ba	Sn	Sn	Sc	Sc	Sc	Y	1.775	0.738	Be	Sr	Cd	Cd	Si	Sn	Sn	2.801	0.916	Sr	Sr	Ti	Ti	Sc	Sc	Y	Y	3.297	0.532	Be	Sr	Sr	Sr	Ge	Ti	Ti	Ti	3.723	0.809		
Ca	Ca	Sn	Sn	Al	Al	Al	Ga	1.776	0.674	Ba	Ba	Zr	Zr	Al	Al	Al	Sc	2.801	0.872	Ca	Ca	Si	Si	Si	Ga	Sc	Sc	3.297	0.482	Be	Sr	Sr	Sr	Ge	Ge	Hf	Hf	3.723	0.915	
Ba	Ba	Cd	Cd	Sn	Sn	Sn	Ti	1.785	0.690	Cd	Cd	Ti	Ti	Al	Al	Y	Y	2.802	0.805	Be	Al	Ba	Ba	Si	Hf	Hf	Hf	3.297	0.486	Be	Sr	Sr	Sr	Ge	Ge	Zr	Zr	3.723	0.816	
Cd	Cd	Zr	Hf	In	In	In	In	1.786	0.673	Be	Be	Ca	Cd	Cd	Ge	Ge	Ge	2.802	0.836	Al	Al	Al	Ga	Ga	Ga	In	Y	3.298	0.814	Mg	Mg	Ge	Hf	Sc	Sc	Sc	Sc	3.723	0.791	
Zn	Zn	Ge	Ge	Ga	Ga	Ga	In	1.788	0.754	Sr	Sr	Sr	Cd	Ti	Ti	Ti	Zr	2.803	0.853	Ca	Ca	Ca	Zn	Sn	Sn	Ti	Ti	3.298	0.947	Mg	Mg	Mg	Ba	Si	Si	Hf	Hf	3.724	0.821	
Mg	Sr	Sr	Cd	Sn	Sn	Sn	Sn	1.789	0.832	Ba	Ba	Ba	Zr	Zr	Al	Al	Y	Y	2.803	0.815	Sr	Sr	Ba	Ba	Ti	Ti	Zr	Zr	3.298	1.092	Be	Be	Ca	Ca	Si	Hf	Hf	Hf	3.724	0.695
Cd	Cd	Cd	Cd	Si	Ge	Sn	Sn	1.790	0.963	Ba	Ba	Zn	Zn	Ti	Ti	Ti	Hf	Hf	2.803	0.818	Be	Zn	Hf	Hf	Ga	Ga	Ga	Ga	3.299	0.729	Be	Cd	Cd	Cd	Si	Si	Ti	Ti	3.725	0.690
Zn	Zn	Sn	Sn	Al	Al	Ga	Ga	1.793	0.725	Ca	Ca	Zn	Zn	Ge	Ge	Ge	Zr	2.804	0.848	Cd	Cd	Ge	Ti	Sc	Sc	Sc	Sc	3.300	0.753	Be	Be	Hf	Hf	Al	Al	Sc	Sc	3.725	0.833	
Sr	Sr	Si	Ge	Ga	Ga	Ga	Ga	1.795	0.822	Ba	Ba	Zn	Zn	Ge	Ge	Ti	Ti	2.804	0.712	Be	Be	Si	Sn	Y	Y	Y	Y	3.300	0.768	Be	Be	Ca	Ca	Ti	Ti	Ti	Zr	3.725	0.654	
Sr	Cd	Cd	Cd	Sn	Sn	Sn	Ti	1.796	0.950	Ca	Cd	Zr	Zr	Ga	Ga	Ga	Ga	2.805	0.601	Be	Be	Be	Ca	Sn	Zr	Zr	Zr	3.300	0.361	Be	Sr	Sr	Sr	Ti	Ti	Zr	Zr	3.725	0.672	
Mg	Sr	Cd	Cd	Al	Al	Al	Al	1.796	0.753	Sr	Sr	Zr	Zr	Ga	Ga	Sc	Sc	2.805	0.589	Mg	Zn	Hf	Hf	Ga	Zr	Ga	Ga	3.301	0.477	Mg	Cd	Cd	Cd	Si	Si	Ti	Ti	3.725	0.781	
Sr	Sr	Cd	Cd	Ge	Ge	Ge	Sn	1.796	0.768	Be	Be	Be	Cd	Ge	Hf	Hf	Hf	2.805	0.727	Sr	Sr	Sr	Zn	Zr	Zr	Hf	Hf	3.301	0.717	Mg	Ca	Sr	Sr	Ti	Ti	Ti	Ti	3.726	0.807	
Ca	Ca	Ge	Zr	In	In	In	In	1.798	0.874	Sr	Zn	Zr	Zr	Ga	Ga	Ga	Ga	2.806	0.593	Ba	Ba	Ba	Ba	Sn	Ti	Ti	Hf	3.301	0.393	Be	Be	Be	Ba	Si	Si	Si	Ti	3.726	0.834	
Cd	Cd	Sn	Sn	Al	Y	Y	Y	1.799	0.677	Mg	Ca	Si	Si	Zr	Ga	Ga	Ga	2.806	0.584	Be	Be	Ba	Ba	Ba	Si	Zr	Zr	3.301	0.410	Be	Mg	Mg	Ba	Hf	Hf	Hf	Hf	3.726	0.778	
Mg	Mg																																							

Zn	Cd	Hf	Hf	In	In	In	In	1.901	-0.191	Zn	Zn	Cd	Cd	Ge	Ge	Ge	Ge	Zr	2.837	0.962	Sr	Sr	Sr	Zn	Sn	Ti	Ti	Ti	3.320	0.647	Be	Be	Zn	Zn	Ge	Ge	Ti	Ti	3.755	1.025
Sr	Sr	Cd	Cd	Ge	Ge	Hf	Hf	1.904	0.196	Zn	Zn	Zr	Zr	Ge	Ge	Ge	Ge	In	2.838	1.089	Ca	Ba	Ba	Ba	Sn	Hf	Hf	Hf	3.320	0.663	Mg	Zn	Zn	Zn	Ti	Hf	Hf	Hf	3.755	0.622
Be	Ca	Si	Si	In	In	In	In	1.904	0.145	Zn	Zn	Si	Si	Ge	Ge	Ge	Ge	Y	2.838	0.723	Mg	Mg	Mg	Sr	Sn	Hf	Hf	Hf	3.320	0.669	Mg	Mg	Sr	Sr	Ge	Ge	Ge	Ti	3.755	0.636
Be	Be	Sn	Sn	Sn	Sn	In	In	1.904	-0.276	Ba	Ba	Zr	Zr	Al	Al	Al	Al	Ga	2.838	0.701	Sr	Ba	Ba	Ba	Sn	Ti	Ti	Ti	3.320	0.283	Ca	Sr	Sr	Zn	Si	Si	Si	Si	3.756	1.044
Sr	Ba	Sn	Sn	Sn	Sc	Sc	Sc	1.907	0.198	Sr	Ba	Cd	Cd	Hf	Hf	Hf	Hf	Y	2.838	0.729	Mg	Mg	Sr	Cd	Ti	Ti	Ti	Ti	3.321	0.341	Mg	Mg	Sr	Zn	Ti	Ti	Ti	Ti	3.756	0.726
Ca	Ba	Ba	Cd	Sn	Sn	Sn	Sn	1.907	0.142	Sr	Ca	Ba	Cd	Hf	Hf	Hf	Hf	Y	2.839	0.710	Sr	Ba	Ba	Ba	Zr	Zr	Hf	Hf	3.321	0.542	Ca	Ca	Sr	Sr	Ge	Ge	Ti	Ti	3.757	0.934
Ba	Cd	Zr	Zr	In	In	In	In	1.910	-0.284	Ca	Ca	Hf	Hf	Ge	Ge	Ge	Ge	Y	2.839	0.681	Be	Ba	Si	Si	Al	Al	Al	Al	3.322	0.316	Be	Cd	Cd	Cd	Si	Si	Si	Si	3.757	1.167
Ba	Zn	Sn	Sn	Al	Al	Al	Al	1.912	0.423	Be	Be	Be	Zn	Sn	Sn	Sn	Sn	Zr	2.840	0.719	Be	Ca	Ba	Ba	Ge	Ge	Ge	Ge	3.322	0.322	Be	Be	Ca	Ca	Sn	Sn	Zr	Zr	3.757	0.639
Mg	Cd	Ge	Ge	Ge	Ge	Ge	Ge	1.913	0.415	Ca	Ca	Hf	Hf	Ge	Ge	Ge	Ge	In	2.840	0.745	Be	Be	Be	Zn	Ge	Ge	Ge	Zr	3.322	0.328	Zn	Zn	Si	Hf	Al	Al	Al	Al	3.758	0.834
Mg	Mg	Si	Ge	In	In	In	In	1.915	-0.235	Cd	Cd	Cd	Cd	Sn	Ti	Zr	Zr	Y	2.840	0.740	Be	Sr	Ti	Ti	Sc	Sc	Sc	Sc	3.322	0.307	Mg	Mg	Ge	Ti	Y	Y	Y	Y	3.758	1.204
Mg	Ca	Si	Si	In	In	In	In	1.916	0.288	Sr	Sr	Hf	Hf	Al	Al	Al	Al	Sc	2.841	0.744	Sr	Sr	Sr	Sr	Sn	Ti	Hf	Hf	3.323	0.413	Mg	Ca	Ca	Ba	Zr	Zr	Zr	Zr	3.758	0.427
Ba	Zn	Zn	Zn	Ge	Ge	Sn	Sn	1.917	0.298	Ca	Sr	Zr	Zr	Ge	Ge	Ge	Ge	Ga	2.841	0.555	Be	Ca	Ca	Zn	Ge	Ge	Ge	Ge	3.323	0.597	Be	Ba	Ba	Ba	Si	Si	Ti	Ti	3.758	0.464
Zn	Zn	Cd	Cd	Si	Sn	Sn	Sn	1.917	0.011	Be	Be	Sr	Cd	Zr	Zr	Zr	Zr	Y	2.841	0.482	Ca	Ba	Ba	Ba	Sn	Sn	Ti	Ti	3.324	0.199	Be	Be	Be	Ca	Ge	Ti	Ti	Ti	3.759	0.639
Be	Sr	Ti	Ti	In	In	In	In	1.917	0.283	Ca	Ca	Si	Sn	Y	Y	Y	Y	Y	2.841	0.514	Sr	Zn	Zn	Zn	Si	Si	Si	Ge	3.325	0.173	Be	Be	Be	Be	Si	Si	Sn	Hf	3.759	1.597
Ca	Sr	Zn	Zn	Sn	Sn	Sn	Sn	1.918	0.291	Ba	Ba	Hf	Hf	Sc	Sc	Sc	Y	2.841	0.599	Mg	Mg	Zr	Zr	Al	Y	Y	Y	3.325	0.180	Mg	Zn	Zn	Zn	Zr	Zr	Hf	Hf	3.760	1.524	
Cd	Cd	Sn	Sn	Al	Al	Al	Sc	1.919	-0.007	Zn	Zn	Zn	Cd	Sn	Sn	Ti	Ti	2.841	0.410	Cd	Cd	Cd	Cd	Ge	Hf	Hf	Hf	3.325	0.108	Ca	Ca	Sr	Sr	Si	Si	Sn	3.760	1.465		
Sr	Sr	Hf	Zr	Ge	Ga	Ga	Ga	1.919	0.279	Ba	Zn	Zn	Zn	Si	Hf	Hf	Hf	2.841	0.379	Be	Mg	Ba	Ba	Ge	Ge	Ge	Ge	3.325	0.246	Be	Sr	Sr	Sr	Zr	Zr	Zr	Hf	3.760	1.653	
Sr	Cd	Hf	Hf	In	In	In	In	1.919	0.290	Cd	Cd	Sn	Ti	Y	Y	Y	Y	2.842	0.767	Ca	Ba	Ba	Ba	Zn	Zr	Zr	Zr	3.325	0.476	Ca	Ba	Ba	Ba	Ge	Ge	Ge	Zr	3.760	1.487	
Sr	Zn	Zn	Zn	Si	Sn	Sn	Sn	1.919	-0.010	Be	Be	Be	Sr	Si	Si	Sn	Sn	2.842	0.696	Be	Ba	Ti	Ti	Al	Al	Al	Al	3.325	0.124	Be	Sr	Sr	Sr	Ti	Hf	Hf	Hf	3.760	1.489	
Cd	Cd	Zr	Zr	Al	In	In	In	1.920	0.226	Cd	Cd	Cd	Cd	Ge	Ge	Ti	Zr	2.842	0.655	Ca	Ca	Ba	Ba	Sn	Sn	Sn	Zr	3.325	0.191	Sr	Ba	Ba	Ba	Si	Si	Si	Ge	3.761	1.049	
Cd	Cd	Zr	Zr	Ge	In	In	In	1.921	0.185	Be	Sr	Zr	Zr	Y	Y	Y	Y	2.842	0.703	Sr	Sr	Ba	Ba	Sn	Sn	Sn	Zr	3.325	0.212	Mg	Mg	Hf	Hf	Al	Al	Al	In	3.762	1.083	
Zn	Zn	Zn	Cd	Ge	Sn	Sn	Sn	1.922	-0.084	Zn	Zn	Ti	Ti	Ga	Ga	Ga	In	2.842	0.566	Ca	Ba	Ba	Ba	Sn	Sn	Zr	Zr	3.326	0.538	Be	Sr	Sr	Sr	Si	Zr	Zr	Zr	3.762	1.310	
Ca	Ca	Ge	Ge	Ge	Ga	Y	Y	1.923	0.226	Ca	Ca	Ca	Cd	Sn	Sn	Ti	Ti	2.842	0.640	Sr	Sr	Sr	Zn	Zr	Hf	Hf	Hf	3.326	0.600	Zn	Be	Ge	Ge	Al	Al	Sc	Sc	3.763	0.892	
Ca	Cd	Cd	Cd	Si	Sn	Sn	Sn	1.924	0.181	Sr	Sr	Zn	Zn	Si	Si	Si	Hf	2.842	0.687	Mg	Mg	Zn	Zn	Sn	Sn	Ti	Ti	3.326	0.809	Zn	Zn	Si	Si	Sc	Sc	Sc	Y	3.764	0.946	
Mg	Ba	Sn	Sn	Sc	Sc	Sc	Sc	1.924	-0.094	Sr	Zn	Zn	Zn	Si	Ge	Ge	Ge	2.843	0.536	Ga	In	Sc	Y	Y	Y	Y	Y	3.327	0.558	Al	Ga	Sc	Sc	Sc	Y	Y	Y	3.764	1.315	
Zr	Cd	Cd	Cd	Sn	Sn	Hf	Hf	1.927	0.450	Sr	Sr	Zr	Zr	Al	Al	Y	Y	2.843	0.635	Sr	Sr	Sr	Sr	Si	Sn	Zr	Zr	3.328	0.526	Be	Zn	Zn	Zn	Ti	Hf	Hf	Hf	3.765	1.653	
Ca	Ca	Cd	Cd	Sn	Sn	Hf	Hf	1.928	0.443	Sr	Sr	Ti	Ti	Al	Al	Al	In	2.843	0.696	Mg	Sr	Cd	Cd	Zr	Zr	Zr	Zr	3.328	0.526	Be	Sr	Zn	Zn	Ti	Ti	Ti	Ti	3.765	1.550	
Ba	Zn	Zn	Zn	Sn	Sn	Sn	Hf	1.929	-0.052	Ca	Ca	Zr	Zr	Al	Al	In	In	2.844	0.581	Be	Sr	Sr	Ba	Ge	Ge	Ge	Ge	3.328	0.406	Be	Ca	Zn	Zn	Hf	Hf	Hf	Hf	3.765	1.601	
Be	Ba	Hf	Hf	In	In	In	In	1.934	0.295	Mg	Mg	Zr	Zr	In	In	In	Y	2.845	0.526	Sr	Sr	Ba	Ba	Ge	Ge	Hf	Hf	3.328	0.504	Mg	Zn	Zn	Zn	Ti	Ti	Ti	Zr	3.765	1.091	
Sr	Sr	Si	Zr	In	In	In	In	1.935	0.255	Sr	Zn	Zn	Zn	Sn	Hf	Hf	Hf	2.845	0.850	Ba	Ba	Ba	Ba	Ge	Ge	Ti	Zr	3.328	0.688	Ca	Ca	Ca	Ca	Ge	Sn	Hf	Hf	3.765	1.161	
Mg	Ca	Ge	Ge	Ge	Ga	Ga	Ga	1.936	0.357	Sr	Zn	Zn	Zn	Ge	Ge	Ge	Ti	2.846	0.861	Ca	Ca	Sr	Sr	Sn	Sn	Sn	Zr	3.329	0.313	Mg	Mg	Mg	Ba	Ge	Ti	Ti	Ti	3.766	1.407	
Zn	Zn	Si	Si	Ge	In	In	In	1.936	0.294	Cd	Cd	Zr	Zr	Ge	Ga	Ge	Sc	2.846	0.828	Al	Ga	Ga	Ga	In	In	Sc	Sc	3.329	0.282	Mg	Mg	Mg	Cd	Si	Si	Ge	Ge	3.766	0.971	
Ba	Ba	Ba	Cd	Si	Sn	Sn	Sn	1.938	0.251	Zn	Zn	Sn	Hf	Y	Y	Y	Y	2.847	0.766	Mg	Sr	Sr	Sr	Sn	Sn	Zr	Zr	3.329	0.288	Mg	Ba	Ba	Ba	Si	Si	Hf	Hf	3.766	1.040	
Ba	Ba	Sn	Ti	Ga	Ga	Ga	Ga	1.938	0.348	Ba	Ba	Ba	Zr	Zr	Al	Y	Y	Y	2.847	0.710	Mg	Mg	Sr	Sr	Ge	Ge	Ge	Sn	3.329	0.316	Mg	Mg	Mg	Ba	Si	Si	Si	Sn	3.766	1.413
Be	Ca	Ca	Cd	Sn	Sn	Sn	Sn	1.938	0.498	Zn	Zn	Si	Hf	Ga	Ga	Ga	Y	2.848	0.825	Be	Be	Sr	Sr	Si	Si	Si	Sn	3.330	0.445	Ca	Ca	Sr	Sr	Si	Si	Ti	Ti	3.766	1.113	
Sr	Sr	Cd	Cd	Ge	Ge	Y	Zr	1.939	0.492	Mg	Mg	Si	Si	Ge	Ga	In	In	2.848	0.748	Sr	Sr	Sr	Ba	Sn	Sn	Ti	Ti	3.330	0.676	Ca	Ca	Zn	Zn	Si	Si	Si	Ge	3.766	1.336	
Be	Sr	Sn	Sn	Y	Y	Y	Y	1.942	0.390	Ba	Ba	Ba	Cd	Si	Si	Si	Hf	2.848	0.677	Be	Cd	Hf	Hf	Sc	Sc	Sc	Sc	3.330	0.343	Mg	Zn	Zn	Zn	Si	Zr	Zr	Zr	3.767	1.536	
Zn	Cd	Zr	Zr	In	In	In	In	1.943	0.455	Mg	Ba	Ba	Ba	Ge	Sn	Sn	Sn	2.848	0.820	Zn	Zn	Zn	Zn	Sn	Ti	Hf	Hf	3.330	0.390	Be	Sr	Sr	Sr	Zr	Hf	Hf	Hf	3.768	0.977	
Mg	Cd	Cd	Cd	Si	Sn	Sn	Sn	1.944	0.445	Be	Be	Be	Ba	Ge	Sn	Sn	Zr	2.849	0.931	Ca	Ba	Ti	Ti	Sc	Sc	Sc	Sc	3.330	0.406	Mg	Zn	Zn	Zn	Ti	Zr	Zr	Zr	3.768	1.215	
Cd	Cd	Sn	Ti	Ga	Ga	Ga	Ga	1.945	0.267	Zn	Zn	Hf	Hf	In	In	Sc	Sc	2.851	1.088	Be	Ca	Zn	Zn	Ge	Ge	Ge	Ge	3.330	0.925	Be	Be	Ge	Ti	Ga	Ga	Ga	Ga	3.769	1.558	
Sr	Sr	Si	Ti	In	In	In	In	1.946	0.217	Sr	Ti	Ti	Ti	Ga	Ga	Sc	Sc	2.851	1.095	Sr	Sr	Sr	Zn	Si	Si	Si	Ge	3.330	0.941	Be	Sr	Sr	Sr	Si	Hf	Hf	Hf	3.769	0.767	
Mg	Zn	Cd	Cd	Sn	Sn	Sn	Sn	1.947	0.149	Cd	Cd	Ti	Ti	Ga	Ga	Sc	Sc	2.851	0.836	Mg	Mg	Ge	Sn	Sc	Sc	Sc	Sc	3.330	1.108	Be	Ca	Sr	Sr	Zr	Zr	Zr	Zr	3.769	0.835	
Mg	Ba	Ti	Ti	In	In	In	In	1.947	0.022	Ga	Ga	Ga	Ga	In	In	Sc	Y	2.852	0.937	Sr	Sr	Ba	Ba	Ba	Zr	Zr	Zr	3.331	0.960	Mg	Sr	Sr	Sr	Si	Si	Hf	Hf	3.769	1.017	
Ba	Ba	Si	Zr	In	In	In	In	1.947	0.200	Ca	Ca	Ca	Zn	Si	Si	Sn	Sn	2.852	1.085	Be	Ca	Ca	Cd	Zr	Zr	Zr	Zr	3.331	0.909	Be	Zn	Zn	Zn	Si	Zr	Zr	Zr	3.769	0.973	
Sr	Ba	Ba	Cd	Sn	Sn	Sn	Sn	1.951	0.189	Sr	Sr	Sr	Cd	Si	Ti	Ti	Ti	2.853	0.816	Be	Be	Be	Ba	Si	Ti	Ti	Ti	3.331	0.903	Mg										

Zn	Zn	Si	Ti	In	In	In	In	2.040	-0.824	Ca	Zn	Cd	Cd	Zr	Zr	Zr	2.879	0.977	Mg	Mg	Ge	Sn	Al	Al	Al	Al	3.351	0.632	Al	Al	Al	Ga	Ga	In	Sc	Sc	3.802	0.881	
Cd	Cd	Hf	Hf	Ga	Ga	In	In	2.041	-0.597	Sr	Zn	Zn	Zn	Ti	Ti	Ti	2.879	1.043	Al	Ga	In	In	Y	Y	Y	Y	3.351	0.611	Be	Be	Be	Be	Si	Si	Sn	Zr	3.803	0.885	
Cd	Cd	Cd	Cd	Ge	Sn	Sn	HF	2.042	-0.453	Sr	Sr	Hf	Hf	Ga	Sc	Sc	2.880	1.157	Sr	Sr	Ba	Ba	Zr	Zr	Zr	HF	3.351	0.618	Be	Zn	Zn	Zn	Zr	HF	HF	HF	3.804	0.834	
Cd	Cd	Cd	Cd	Si	Sn	Sn	Zr	2.043	-0.488	Be	Be	Ba	Cd	Ge	Ge	Ge	2.880	1.335	Ca	Ca	Ba	Ba	Sn	HF	HF	HF	3.351	0.249	Be	Mg	Ge	Ge	Sc	Sc	Sc	3.804	0.872		
Mg	Sr	Zn	Zn	Sn	Sn	Sn	Sn	2.043	-0.329	Mg	Mg	Mg	Cd	Si	Si	Sn	2.880	1.297	Be	Ba	Si	Si	Sc	Sc	Sc	Sc	3.352	0.414	Be	Be	Ge	Be	Sn	Ti	Zr	Zr	3.805	0.804	
Cd	Cd	Si	Si	Al	Al	In	In	2.044	-0.422	Ba	Ba	Ba	Zn	Ge	Zr	Zr	2.881	1.056	Be	Be	Be	Zn	Ti	Zr	Zr	3.352	0.816	Mg	Ba	Cn	Zn	Zr	Zr	Zr	Zr	3.806	0.818		
Ca	Ca	Zn	Zn	Si	Sn	Sn	Sn	2.045	-0.477	Ba	Ba	Ba	Ba	Zn	Si	Si	HF	2.881	1.218	Sr	Sr	Ba	Ba	Ge	Ge	Zr	3.352	0.667	Ca	Ca	Zn	Ca	Sr	Ge	Ge	Zr	3.807	0.892	
Mg	Zn	Si	Si	In	In	In	In	2.045	-0.281	Mg	Mg	Cd	Cd	Sn	Sn	Ti	2.881	1.300	Ca	Ba	Ba	Si	Ti	HF	HF	3.352	0.860	Zn	Zn	Si	Si	Al	Sc	Sc	Sc	3.807	0.617		
Sr	Sr	Ge	Ge	Al	Al	Al	Sc	2.046	-0.418	Mg	Mg	Sr	Sr	Si	Sn	Sn	2.882	1.034	Mg	Ba	Si	Si	Y	Y	Y	Y	3.352	0.891	Be	Mg	HF	HF	Sc	Sc	Sc	Sc	3.807	0.450	
Mg	Mg	Zn	Cd	Sn	Sn	Sn	Sn	2.047	-0.475	Al	Al	Ga	Ga	In	In	Y	2.882	1.187	Be	Be	HF	HF	In	In	Sc	Sc	3.353	0.087	Ca	Ba	Ba	Ba	Ge	Ge	Ge	Ti	3.807	0.167	
Ca	Ca	Si	Si	Ga	In	In	In	2.048	-0.426	Mg	Mg	Mg	Ba	Si	Sn	Sn	2.882	1.296	Sr	Ba	Ba	Ba	Sn	Sn	HF	3.353	0.245	Mg	Ba	Ba	Ba	Zn	Si	Si	Si	3.807	0.908		
Ca	Ca	Cd	Cd	Ge	Ge	Ge	Sn	2.048	-0.609	Sr	Sr	Sr	Zn	Ge	Ge	HF	2.882	0.904	Be	Be	Zn	Zn	Sn	Ti	Ti	3.353	0.648	Mg	Mg	Si	Si	In	Sc	Sc	Sc	3.807	0.662		
Mg	Sr	Sn	Sn	Sc	Sc	Sc	Sc	2.050	-0.708	Mg	Sr	Sn	Sn	Sc	Sc	Y	2.882	0.897	Be	Mg	Ge	Ge	Y	Y	Y	Y	3.354	0.537	Ca	Ca	Ca	Sr	Si	Ge	Ge	Ge	3.808	0.224	
Mg	Mg	Sn	Sn	Ga	Ga	Ga	Sc	2.052	-0.376	Mg	Mg	Mg	Cd	Sn	Sn	Ti	2.883	0.918	Ca	Sr	Ti	Ti	Y	Y	Y	Y	3.354	0.764	Mg	Zn	Si	Si	Y	Y	Y	Y	3.809	-0.054	
Be	Sr	Zr	Zr	In	In	In	In	2.053	-0.593	Cd	Cd	Cd	Cd	Sn	Zr	HF	2.883	0.889	Mg	Mg	Mg	Sr	Sn	Zr	Zr	3.354	0.800	Mg	Mg	Ti	Ti	Al	Ga	Ga	Ga	3.809	-0.021		
Cd	Cd	Sn	Sn	Al	Sc	Sc	Sc	2.054	-0.707	Ca	Cd	Cd	Cd	Sn	Ti	Ti	2.884	0.877	Be	Ca	Cd	Cd	Ti	Ti	Ti	Ti	3.354	0.188	Mg	Mg	Ba	Ba	Si	Si	Si	Zr	3.810	-0.083	
Ca	Ca	Ba	Cd	Sn	Sn	Sn	Sn	2.054	-0.362	Ca	Zn	Zn	Zn	Ge	Ge	HF	2.884	0.908	Be	Be	Sr	Sr	Ge	Ge	Ge	Ti	3.354	0.304	Be	Be	Be	Ca	Si	Ti	Ti	Ti	3.810	0.159	
Mg	Mg	Cd	Cd	Si	Sn	Sn	Sn	2.054	-0.391	Ca	Ba	Ba	Cd	Zr	Zr	Zr	2.884	0.915	Mg	Ca	Ca	Cd	Ti	Ti	Ti	Ti	3.355	0.633	Be	Mg	Mg	Sr	Zr	Zr	Zr	Zr	3.811	0.159	
Mg	Mg	Sn	HF	In	In	In	In	2.055	-0.409	Zn	Zn	Zn	Cd	Ge	Ge	HF	2.885	0.912	Mg	Mg	Cd	Cd	Sn	Ti	Ti	Ti	3.355	0.491	Mg	Mg	Ge	Zr	Sc	Sc	Sc	Sc	3.811	-0.027	
Cd	Cd	HF	HF	In	In	In	Y	2.056	-0.586	Mg	Ba	Ba	Ba	Si	Sn	Sn	2.885	0.916	Zn	Zn	Zn	Zn	Si	Ge	Zr	Zr	3.355	0.633	Mg	Ba	Ba	Ba	Ge	Ge	Ge	Zr	3.811	1.025	
Be	Sr	Zn	Zn	Sn	Sn	Sn	Sn	2.056	-0.696	Sr	Sr	Ge	HF	Y	Y	Y	2.885	0.707	Zn	Zn	Zr	Zr	Al	Al	Sc	Sc	3.356	0.657	Be	Sr	Sr	Sr	Ti	Ti	Ti	Zr	3.811	0.934	
Cd	Cd	Sn	Sn	Sc	Y	Y	Y	2.057	-0.751	Al	Ga	In	In	In	Y	Y	2.885	0.638	Mg	Mg	Ca	Ca	Si	Sn	Sn	3.356	0.835	Mg	Cd	Zr	Zr	Al	Al	Al	Al	3.812	0.766		
Sr	Zn	Zn	Zn	Sn	Sn	Sn	Zr	2.057	-0.289	Sr	Sr	Sr	Cd	Zr	Zr	HF	2.886	0.663	Mg	Mg	Mg	Zn	Zn	Ge	Ge	HF	3.356	0.797	Sr	Sr	Sr	Ba	Si	Si	HF	3.812	0.072		
Mg	Ba	HF	HF	In	In	In	In	2.057	-0.609	Ba	Ba	Ba	Zn	Zn	Ti	Ti	Zr	2.887	0.750	Cd	Cd	Si	Zr	Al	Al	Al	Al	3.356	0.940	Al	Ga	Sc	Sc	Sc	Sc	Y	Y	3.813	0.224
Mg	Mg	Ge	Ge	Ga	Ga	In	In	2.058	-0.782	Ca	Ca	Sn	Ti	Al	Al	Al	2.887	0.573	Sr	Sr	Ba	Ba	Ti	Zr	Zr	Zr	3.357	0.922	Mg	Mg	Mg	Ba	Si	Ti	Ti	Ti	3.813	0.404	
Sr	Sr	Ge	Ge	Al	Al	Al	Ga	2.060	-0.277	Sr	Sr	Sn	Ti	Y	Y	Y	2.887	0.526	Sr	Ba	Ba	Ba	Ti	Zr	Zr	Zr	3.357	0.895	Mg	Ba	Ba	Ba	Ge	Ge	Ge	HF	3.813	0.297	
Sr	Sr	Ge	HF	Ga	Ga	Ga	Ga	2.060	-0.655	Ca	Ca	Ca	Cd	Si	Si	HF	2.887	0.930	Sr	Sr	Sr	Zn	Si	Si	Si	HF	3.357	0.891	Sr	Sr	Ba	Ba	Si	Si	Si	HF	3.815	0.386	
Cd	Cd	Cd	Cd	Ge	Sn	Sn	Zr	2.060	-0.780	Ba	Ba	Zr	Zr	Al	Al	Sc	2.887	0.864	Be	Be	Ti	Ti	Ga	Ga	In	In	3.357	0.777	Mg	Mg	Ca	Zn	Zr	Zr	Zr	Zr	3.815	0.424	
Be	Zn	Zn	Cd	Sn	Sn	Sn	Sn	2.060	0.092	Ca	Zn	Cd	Cd	Ti	Ti	Ti	2.888	0.817	Be	Sr	Sr	Zn	Ti	Ti	Ti	Ti	3.357	0.725	Al	In	Sc	Sc	Sc	Sc	Y	Y	3.815	0.155	
Ba	Ba	Si	Si	Ga	Ga	Ga	Y	2.061	-0.592	Ca	Zn	Zn	Zn	Ge	Ge	HF	2.888	0.860	Be	Be	Sr	Zn	Ti	Ti	Ti	Ti	3.357	0.859	Mg	Mg	Ge	HF	Al	Al	Al	Al	3.815	0.470	
Ba	Ba	Cd	Cd	Ge	Ge	Ge	HF	2.062	-0.772	Cd	Cd	Si	Si	Al	Al	Y	2.889	0.733	Sr	Sr	Si	Ti	Sc	Sc	Sc	Sc	3.358	0.865	Mg	Sr	Sr	Zn	Si	Si	Si	Si	3.816	0.800	
Ba	Ba	Sn	Sn	Sn	Sc	Y	Y	2.065	0.154	Zn	Zn	Ge	Ge	Ga	Sc	Sc	2.889	0.804	Be	Be	Sr	Sr	Ti	Ti	Zr	Zr	3.358	0.841	Mg	Mg	Mg	Zn	Si	Zr	Zr	Zr	3.816	0.351	
Cd	Cd	Sn	Sn	Sn	Sc	Sc	Y	2.067	-0.580	Sr	Sr	HF	HF	Al	Al	Sc	2.890	0.843	Mg	Mg	HF	HF	Ga	Ga	Ga	Y	3.358	0.837	Mg	Mg	Mg	Zn	Sn	Ti	Ti	Ti	3.817	0.625	
Ca	Ca	Si	HF	In	In	In	In	2.067	-0.769	Sr	Sr	Si	Si	In	Sc	Sc	2.891	0.702	Cd	Cd	Ti	Ti	Al	Sc	Sc	Sc	3.358	0.776	Mg	Mg	Ca	Zn	HF	HF	HF	HF	3.817	0.833	
Zn	Zn	Cd	Cd	Ge	Ge	Sn	Sn	2.067	-0.288	Ca	Ca	Zr	Zr	Ga	Ga	In	2.891	0.798	Zn	Zn	Ge	HF	Sc	Sc	Sc	Sc	3.358	0.736	Be	Be	Zr	Zr	Al	Al	Sc	Sc	3.818	0.102	
Ba	Ba	Ti	Ti	In	In	In	Y	2.068	-0.503	Be	Ca	Ge	Ge	Y	Y	Y	2.891	0.855	Be	Be	Sr	Sr	Sn	Zr	Zr	Zr	3.358	0.876	Mg	Mg	Mg	Ba	Si	Si	Ge	Ge	3.818	0.128	
Ca	Cd	HF	HF	In	In	In	In	2.068	-0.611	Ba	Ba	Zn	Zn	Si	Si	HF	2.892	0.746	Zn	Cd	Zr	Zr	Sc	Sc	Sc	Sc	3.358	0.858	Mg	Mg	Ca	Sr	Ti	Ti	Ti	Ti	3.818	0.058	
Mg	Mg	Cd	Cd	Ge	Sn	Sn	Sn	2.069	-0.286	Ba	Ba	Ge	Zr	Y	Y	Y	2.892	0.683	Be	Sr	Ba	Ba	Sn	Sn	HF	HF	3.359	0.829	Ca	Zn	Ti	Ti	Al	Al	Al	Al	3.820	0.947	
Zn	Zn	Si	Si	Al	In	In	In	2.071	-0.537	Ba	Ba	Ti	HF	Al	Al	Al	2.892	1.022	Sr	Ba	Ba	Ba	Ti	HF	HF	HF	3.359	0.826	Mg	Mg	Ti	Ti	In	Sc	Sc	Sc	3.820	0.766	
Sr	Sr	Cd	Cd	Ge	Ge	Ge	HF	2.072	-0.585	Be	Sr	Zn	Zn	Ge	Ge	Ge	2.892	1.032	Ca	Ca	Ba	Ba	Sn	Zr	Zr	Zr	3.359	0.981	Al	Ga	Ga	Ga	Ga	Sc	Sc	Y	3.821	0.485	
Ca	Ca	Sn	Sn	Al	Sc	Sc	Sc	2.072	0.070	Ca	Ca	Sn	Zr	Sc	Sc	Sc	2.894	1.002	Sr	Sr	Ba	Ba	Ti	HF	HF	HF	3.359	0.898	Be	Be	Ge	Ge	Al	Sc	Sc	Sc	3.821	1.233	
Be	Be	Sn	Sn	Ga	Ga	Y	Y	2.072	-0.489	Mg	Zn	Sn	Sn	Sc	Sc	Sc	2.894	0.933	Mg	Sr	Cd	Cd	Si	Si	Si	Si	3.359	0.940	Mg	Mg	Mg	Sr	Si	Si	HF	HF	3.821	0.979	
Ba	Ba	Cd	Cd	Cd	Ge	Ge	HF	2.074	-0.574	Zn	Cd	Cd	Cd	Ge	Ge	HF	2.894	0.881	Mg	Mg	Ge	Ge	Sc	Y	Y	Y	3.359	0.868	Be	Mg	Mg	Sr	HF	HF	HF	HF	3.821	0.549	
Ca	Ca	Si	Si	In	In	In	Sc	2.075	0.130	Ca	Ca	Zn	Zn	Si	Ge	Ge	2.895	1.000	Ba	Ba	Ba	Ba	Ge	Zr	Zr	HF	3.360	0.745	Al	Al	Al	Al	Ga	Ga	In	Y	3.821	0.216	
Zn	Cd	Cd	Cd	Sn	Sn	Sn	HF	2.077	-0.481	Mg	Zn	Zn	Cd	Sn	Sn	Ti	2.895	0.913	Ba	Ba	Ba	Ba	Ba	Ge	Ti	Zr	Zr	3.360	0.728	Ca	Ca	Ca	Si	Sn	Zr	Zr	Zr	3.822	0.285
Zn	Zn	Sn	Sn	Al	Y	Y	Y	2.077	-0.571	Ca	Ca	Cd	Cd	Ti	Zr	Zr	2.897	0.847	Be	Sr	Zr	Zr	Al	Al	Al	Al	3.360	0.906	Be	Ca	Be	Mg	Si	HF	HF	HF	3.822	0.234	
Ba	Cd	Sn	Sn	Y	Y	Y																																	

Mg	Mg	Sn	Ga	Y	Y	Y	2.130	-0.137	Zn	Zn	Cd	Cd	Si	Ge	Ge	Ge	2.921	0.629	Ca	Ca	Ca	Zn	Si	Si	Zr	Zr	3.378	0.696	Mg	Zn	Zn	Zn	Sn	Ti	Ti	Ti	3.853	0.538
Be	Be	Zn	Cd	Sn	Sn	Sn	2.131	-0.177	Sr	Sr	Zn	Cd	Hf	Hf	Hf	Hf	2.921	0.142	Sr	Sr	Sr	Zn	Si	Si	Si	Zr	3.378	0.771	Mg	Mg	Mg	Cd	Si	Si	Ti	Ti	3.853	0.735
Sr	Sr	Cd	Cd	Si	Si	Zr	2.134	0.143	Ca	Sr	Sr	Cd	Ti	Ti	Ti	Ti	2.922	0.131	Zn	Zn	Ti	Ti	Sc	Y	Y	Y	3.378	0.989	Mg	Mg	Ti	Ti	Sc	Y	Y	Y	3.853	0.500
Mg	Sr	Hf	Hf	In	In	In	2.135	-0.151	Cd	Cd	Cd	Cd	Ge	Ti	Hf	Hf	2.922	0.649	Ba	Zn	Ti	Ti	Al	Al	Al	Al	3.379	1.020	Ca	Sr	Sr	Sr	Ge	Ge	Ge	Ti	3.854	0.678
Ba	Ba	Zn	Zn	Sn	Sn	Zr	2.135	-0.184	Ba	Ba	Zn	Zn	Si	Zr	Zr	Zr	2.922	0.133	Mg	Ba	Ba	Ba	Ba	Sn	Sn	Sn	3.380	0.835	Ca	Ca	Ca	Ca	Ge	Sn	Sn	Zr	3.854	0.745
Ba	Ba	Cd	Cd	Ge	Ge	Ge	2.135	0.113	Ba	Ba	Zn	Zn	Si	Hf	Hf	Hf	2.923	0.132	Ca	Ca	Ca	Ba	Sr	Sn	Sn	Zr	3.380	0.768	Mg	Mg	Mg	Sr	Si	Si	Zr	Zr	3.855	0.351
Ca	Zn	Zn	Zn	Sn	Sn	Sn	2.137	-0.032	Mg	Mg	Zn	Zn	Sn	Sn	Hf	Hf	2.923	0.441	Ca	Ca	Ba	Ba	Ti	Ti	Zr	Zr	3.380	0.854	Ga	In	Sc	Sc	Sc	Sc	Y	Y	3.855	0.407
Cd	Cd	Ge	Ge	Ge	Y	Y	2.139	-0.060	Sr	Zn	Zn	Zn	Ge	Hf	Hf	Hf	2.923	0.223	Al	Al	Al	In	In	Sc	Y	Y	3.380	0.815	Mg	Mg	Ba	Cd	Si	Si	Si	Si	3.856	0.322
Ba	Ba	Cd	Cd	Si	Si	Ge	2.139	0.155	Be	Be	Ba	Cd	Ti	Ti	Ti	Ti	2.923	0.153	Sr	Ba	Ba	Ba	Ge	Zr	Zr	Zr	3.380	0.744	Mg	Ba	Zn	Zn	Hf	Hf	Hf	Hf	3.856	0.681
Zn	Zn	Cd	Cd	Sn	Sn	Sn	2.140	0.166	Mg	Mg	Ba	Ba	Ge	Ge	Sn	Sn	2.923	0.491	Ca	Ba	Ba	Ba	Ge	Ge	Zr	Zr	3.380	0.734	Be	Be	Ca	Ca	Si	Si	Si	Sn	3.857	0.634
Be	Be	Si	Sn	In	In	In	2.141	0.085	Cd	Cd	Ge	Zr	Y	Y	Y	Y	2.924	0.298	Ba	Ba	Ba	Ba	Si	Ti	Hf	Hf	3.380	1.321	Mg	Ca	Ca	Ca	Sn	Sn	Zr	Zr	3.857	0.481
Sr	Sr	Cd	Cd	Ge	Ge	Ti	2.142	0.220	Ca	Ca	Si	Si	Ga	Ga	Sc	Sc	2.924	0.266	Be	Be	Zn	Zn	Ge	Ge	Zr	Zr	3.381	1.186	Be	Ca	Ca	Ca	Sn	Sn	Sn	Zr	3.858	0.843
Mg	Cd	Ti	Ti	In	In	In	2.142	0.089	Ca	Ca	Sn	Zr	Y	Y	Y	Y	2.924	0.621	Be	Cd	Cd	Cd	Ge	Zr	Zr	Zr	3.381	1.162	Mg	Sr	Zn	Zn	Zr	Zr	Zr	Zr	3.858	0.793
Sr	Zn	Zr	Zr	In	In	In	2.143	0.059	Ca	Cd	Cd	Cd	Si	Zr	Zr	Zr	2.924	0.247	Mg	Mg	Ti	Ti	Al	Al	In	In	3.381	1.152	Be	Ca	Ca	Ca	Sn	Sn	Sn	Hf	3.858	0.477
Ca	Sr	Ti	Ti	In	In	In	2.144	0.232	Cd	Cd	Ge	Hf	Al	Al	Al	Al	2.925	0.278	Be	Ba	Ba	Ba	Ba	Sn	Sn	Zr	3.381	0.980	Ca	Ca	Ca	Ba	Ge	Ge	Ge	Ti	3.858	0.453
Sr	Cd	Sn	Sn	Y	Y	Y	2.145	0.072	Ba	Zn	Zn	Zn	Sn	Ti	Ti	Ti	2.925	0.639	Be	Be	Be	Zn	Zr	Zr	Hf	Hf	3.382	0.954	Mg	Ca	Ca	Ca	Sn	Sn	Sn	Zr	3.859	0.493
Sr	Sr	Sr	Cd	Si	Si	Sn	2.146	0.054	Cd	Cd	Cd	Cd	Sn	Ti	Ti	Zr	2.925	0.234	Zn	Zn	Si	Zr	Y	Y	Y	Y	3.382	1.082	Ca	Ca	Ca	Ca	Sn	Sn	Ti	Zr	3.859	0.332
Ba	Ba	Ge	Ti	Ga	Ga	Ga	2.146	0.233	Ca	Ca	Ca	Cd	Si	Si	Zr	Zr	2.925	0.279	Ba	Ba	Ba	Ba	Si	Si	Zr	Hf	3.383	1.131	Be	Be	Hf	Hf	Ga	Ga	Ga	Ga	3.859	0.603
Ca	Ca	Si	Si	Al	In	In	2.147	0.470	Ba	Ba	Zn	Zn	Si	Si	Si	Zr	2.926	0.559	Mg	Zn	Cd	Cd	Zr	Zr	Zr	Zr	3.384	1.286	Mg	Mg	Ca	Ca	Ge	Ge	Ge	Sn	3.860	0.638
Be	Zn	Si	Si	In	In	In	2.148	0.385	Be	Ca	Ba	Ba	Sn	Sn	Sn	Sn	2.926	0.647	Ca	Sr	Sr	Sr	Ge	Sn	Y	Zr	3.384	1.015	Mg	Sr	Sr	Sr	Si	Si	Ti	Ti	3.860	0.346
Ba	Zn	Zn	Zn	Sn	Sn	Sn	2.148	0.284	Ca	Ca	Zn	Cd	Zr	Zr	Zr	Zr	2.926	0.650	Be	Be	Ge	Ge	Sc	Y	Y	Y	3.385	0.930	Al	In	In	Sc	Sc	Sc	Sc	3.860	0.845	
Ca	Ca	Si	Ti	In	In	In	2.149	0.411	Al	Ga	Ga	Ga	Ga	Ga	In	Y	2.926	0.669	Be	Be	Zn	Cd	Ge	Ge	Ge	Ge	3.385	0.923	Ca	Ca	Ba	Ba	Si	Si	Zr	Zr	3.862	0.824
Be	Cd	Zr	Zr	In	In	In	2.149	0.366	Mg	Mg	Mg	Cd	Cd	Ge	Ge	Zr	2.926	0.594	Ca	Ca	Si	Hf	Sc	Sc	Sc	Sc	3.386	0.997	Ca	Ca	Ca	Ca	Sr	Si	Si	Ge	3.863	0.653
Ca	Ca	Sn	Hf	Ga	Ga	Ga	2.149	0.294	Zn	Cd	Hf	Hf	Y	Y	Y	Y	2.927	0.651	Mg	Zn	Ti	Ti	Ga	Ga	Ga	Ga	3.386	1.055	Mg	Mg	Zr	Zr	Al	Sc	Sc	Sc	3.865	0.455
Sr	Sr	Hf	Hf	In	In	In	2.151	0.396	Zn	Cd	Cd	Cd	Ge	Ge	Zr	Zr	2.928	0.683	Be	Be	Sr	Sr	Si	Si	Hf	Hf	3.387	1.223	Be	Ca	Si	Si	Sc	Sc	Sc	Sc	3.865	0.474
Cd	Cd	Ge	Ti	Ga	Ga	Ga	2.151	0.361	Cd	Cd	Sn	Ti	Al	Al	Al	Al	2.929	0.580	Mg	Sr	Cd	Cd	Hf	Hf	Hf	Hf	3.387	0.950	Mg	Mg	Mg	Cd	Si	Si	Si	Zr	3.865	0.451
Ca	Ca	Cd	Cd	Ge	Ge	Hf	2.151	0.058	Ca	Ca	Zn	Zn	Ge	Ge	Ti	Ti	2.929	0.650	Zn	Cd	Cd	Cd	Si	Si	Ti	Ti	3.387	0.882	Mg	Mg	Sr	Sr	Si	Si	Hf	Hf	3.866	0.620
Sr	Sr	Ge	Ge	In	In	Sc	2.151	-0.012	Sr	Sr	Si	Zr	Al	Al	Al	Al	2.929	0.737	Sr	Sr	Si	Ti	Y	Y	Y	Y	3.388	0.877	Mg	Ca	Ca	Zn	Hf	Hf	Hf	Hf	3.867	0.598
Zn	Zn	Ti	Hf	In	In	In	2.152	-0.069	Mg	Mg	Si	Ge	Ga	Ga	Ga	Ga	2.929	0.604	Be	Be	Ge	Ge	Ga	Ga	Sc	Sc	3.389	1.294	Mg	Ca	Ca	Ca	Ge	Ge	Ge	Sn	3.867	0.433
Cd	Cd	Zr	Zr	Al	Al	In	2.152	0.074	Ca	Ca	Zn	Zn	Sn	Sn	Ti	Ti	2.930	0.592	Be	Be	Be	Sr	Ge	Ti	Ti	Ti	3.389	1.172	Mg	Mg	Zn	Zn	Zr	Hf	Hf	Hf	3.868	0.458
Ba	Ba	Zn	Cd	Ge	Ge	Ge	2.155	-0.015	Mg	Ba	Cd	Cd	Ge	Ge	Ge	Ge	2.931	0.756	Ca	Ca	Zn	Zn	Ti	Zr	Zr	Zr	3.389	1.167	Be	Be	Si	Si	Sc	Y	Y	Y	3.868	0.569
Ba	Ba	Ti	Zr	In	In	In	2.155	-0.077	Ca	Cd	Cd	Cd	Si	Si	Ti	Ti	2.931	0.600	Be	Be	Be	Cd	Ge	Ge	Ti	Ti	3.390	1.140	Mg	Ca	Ca	Sr	Hf	Hf	Hf	Hf	3.869	0.704
Zn	Cd	Cd	Cd	Si	Si	Sn	2.157	0.070	Sr	Sr	Hf	Hf	Sc	Sc	Sc	Y	2.932	0.590	Sr	Sr	Ba	Ba	Ge	Zr	Zr	Zr	3.390	0.973	Al	Ga	Ga	Ga	Sc	Y	Y	Y	3.869	0.598
Cd	Cd	Zr	Zr	In	In	Y	2.158	0.057	Sr	Sr	Zn	Zn	Si	Si	Si	Ge	2.932	0.851	Ca	Ca	Sr	Ba	Zn	Ti	Ti	Ti	3.390	0.948	Be	Be	Zr	Hf	Ga	Ga	Ga	Ga	3.870	0.689
Ba	Ba	Sn	Hf	Al	Al	Al	2.158	0.046	Zn	Zn	Ge	Sn	Al	Al	Al	Al	2.932	0.832	Ca	Ca	Zr	Hf	Sc	Sc	Sc	Sc	3.390	0.966	Be	Be	Mg	Mg	Sn	Hf	Hf	Hf	3.870	0.698
Cd	Cd	Ge	Ge	Al	Al	Y	2.159	0.296	Sr	Sr	Sr	Cd	Si	Si	Si	Ge	2.935	0.830	Mg	Sr	Sr	Sr	Sn	Sn	Sn	Ti	3.390	1.006	Zn	Zn	Ti	Ti	Al	Al	Al	Al	3.870	0.507
Sr	Sr	Ti	Zr	In	In	In	2.160	0.213	Zn	Zn	Zn	Zn	Si	Ge	Sn	2.935	0.742	Ca	Ca	Ca	Zn	Si	Si	Si	Sn	3.390	1.163	Al	Ga	Ca	Ba	Zn	Si	Si	Si	3.871	0.564	
Zn	Zn	Zn	Cd	Ge	Ge	Sn	2.160	0.145	Sr	Sr	Zn	Zn	Ti	Ti	Zr	Zr	2.935	0.650	Mg	Mg	Hf	Hf	Ga	Ga	Ga	In	3.391	0.929	Mg	Zn	Zr	Zr	Sc	Sc	Sc	Sc	3.871	0.477
Sr	Sr	Zn	Zn	Sn	Sn	Sn	2.160	0.445	Ca	Ca	Hf	Hf	Al	Al	Y	Y	2.935	0.737	Zn	Cd	Si	Si	Y	Y	Y	Y	3.391	0.871	Be	Be	Ge	Hf	Sc	Sc	Sc	Sc	3.871	0.696
Mg	Mg	Sn	Sn	Al	Ga	Ga	2.161	0.214	Be	Be	Sn	Sn	In	Sc	Sc	Sc	2.935	0.785	Be	Be	Be	Be	Ge	Hf	Hf	Y	3.392	0.867	Be	Be	Be	Be	Ge	Ti	Zr	Zr	3.872	0.655
Mg	Cd	Cd	Cd	Ge	Ge	Sn	2.161	0.054	Be	Be	Be	Cd	Ge	Ge	Hf	Hf	2.936	0.543	Ca	Ba	Ba	Ba	Sn	Sn	Ti	3.392	0.897	Be	Be	Hf	Hf	Al	Al	Ga	Ga	3.872	0.508	
Zn	Zn	Zn	Cd	Sn	Sn	Sn	2.163	0.353	Ba	Ba	Hf	Hf	Sc	Y	Y	Y	2.936	0.691	Ca	Cd	Hf	Hf	Al	Al	Al	Al	3.392	0.945	Mg	Ca	Ca	Sr	Ti	Ti	Ti	Ti	3.872	0.849
Sr	Cd	Hf	Hf	In	In	In	2.164	0.073	Be	Be	Ge	Ge	In	In	Sc	Sc	2.936	0.762	Be	Be	Sr	Sr	Ge	Hf	Hf	Hf	3.393	1.115	Mg	Mg	Mg	Zn	Si	Si	Hf	Hf	3.874	0.809
Cd	Cd	Cd	Cd	Si	Sn	Sn	2.164	0.089	Sr	Sr	Zr	Zr	Al	Al	Al	Ga	2.937	0.704	Ba	Ba	Ba	Ba	Si	Zr	Hf	Hf	3.393	0.879	Al	Al	Ga	In	In	Sc	Sc	Sc	3.874	0.501
Cd	Cd	Ti	Ti	In	In	Y	2.168	0.489	Mg	Sr	Sr	Sr	Si	Sn	Sn	Sn	2.938	0.810	Ca	Ca	Ti	Zr	Y	Y	Y	Y	3.393	0.836	Ca	Ca	Ca	Ca	Si	Ge	Sn	Sn	3.875	0.450
Ba	Ba	Zr	Zr	In	In	Y	2.169	-0.052	Sr	Zn	Zn	Zn	Ge	Ge	Ti	Ti	2.939	0.629	Ca	Ca	Zn	Zn	Si	Si	Si	Si	3.393	0.834	Be	Ca	Ca	Ba	Hf	Hf	Hf	Hf	3.875	0.529
Mg	Sr	Zr																																				

Ba	Zn	Si	Si	Gi	Ga	Ga	Ga	2.230	0.709	Be	Be	Si	Si	Si	Gi	In	In	2.958	0.540	Be	Be	Ba	Ba	Si	Ti	Ti	Ti	3.412	0.766	Be	Be	Hf	Hf	Al	Al	Al	In	3.915	0.573	
Ca	Ba	Ti	Ti	Al	In	In	In	2.231	0.479	Mg	Mg	Mg	Mg	Sr	Si	Sn	Sn	2.959	0.573	Mg	Mg	Cd	Cd	Zr	Zr	Zr	Hf	3.412	0.434	Mg	Ca	Si	Si	Sc	Sc	Sc	3.915	0.944		
Ca	Ca	Ge	Ge	Al	Al	Al	In	2.231	0.336	Zn	Cd	Cd	Cd	Ge	Ge	Ge	Ti	2.959	0.465	Ca	Ca	Ti	Ti	Al	Al	Al	Ga	3.412	0.722	Sr	Sr	Sr	Ba	Si	Si	Si	Ti	3.915	1.340	
Sr	Sr	Ge	Ge	Ga	Y	Y	Y	2.232	0.744	Sr	Zn	Zn	Zn	Ti	Hf	Hf	Hf	2.960	0.530	Al	Al	Al	Ga	Ga	In	In	Sc	3.412	0.118	Sr	Ba	Ba	Ba	Si	Si	Si	Ti	3.915	0.639	
Ba	Ba	Ba	Cd	Sn	Sn	Hf	Hf	2.233	0.716	Ca	Ca	Ti	Ti	Ti	Ga	Ga	Sc	2.960	0.553	Ca	Cd	Si	Si	Al	Al	Al	Al	3.413	0.415	Be	Mg	Zn	Zn	Hf	Hf	Hf	Hf	3.915	1.000	
Ca	Ca	Sn	Sn	Sc	Sc	Y	Y	2.233	0.696	Sr	Sr	Sr	Cd	Si	Si	Si	Zr	2.960	0.537	Ca	Ba	Ba	Ba	Zr	Zr	Zr	Hf	3.413	0.775	Be	Sr	Sr	Sr	Ge	Ge	Ge	Ge	3.916	1.339	
Ba	Ba	Si	Si	Gi	Ga	Ga	Sc	2.234	0.560	Ca	Zn	Ge	Ge	Y	Y	Y	Y	2.960	0.544	Be	Be	Be	Be	Sn	Sn	Zr	Hf	3.413	0.473	Be	Sr	Sr	Sr	Hf	Sc	Sc	Sc	3.917	0.399	
Mg	Cd	Zr	Zr	In	In	In	In	2.234	0.457	Ba	Ba	Ge	Ti	Sc	Sc	Sc	Sc	2.960	0.337	Be	Cd	Zr	Zr	Sc	Sc	Sc	Sc	3.413	0.757	Be	Sr	Sr	Sr	Si	Si	Zr	Zr	3.917	0.455	
Al	Gi	In	In	In	In	Y	Y	2.236	0.508	Be	Be	Mg	Ca	Sn	Sn	Sn	Sn	2.961	0.243	Be	Cd	Zr	Ba	Ba	Sn	Ti	Ti	Zr	3.413	0.042	Be	Sr	Sr	Sr	Si	Si	Hf	Hf	3.918	0.449
Sr	Cd	Cd	Cd	Ge	Ge	Zr	Zr	2.236	0.599	Sr	Sr	Hf	Hf	Al	Al	Sc	Sc	2.962	0.244	Ba	Ba	Ba	Ba	Si	Zr	Zr	Hf	3.414	0.483	Be	Ca	Ba	Ba	Si	Si	Si	Si	3.920	1.551	
Ba	Si	Si	In	In	Sc	Sc	Sc	2.237	0.377	Sr	Zn	Zn	Zn	Ti	Zr	Zr	Zr	2.962	0.550	Sr	Zn	Zr	Zr	Zr	Al	Al	Al	3.414	0.861	Be	Be	Be	Be	Si	Ge	Zr	Zr	3.921	1.380	
Ca	Ca	Ge	Ge	In	Y	Y	Y	2.237	0.386	Mg	Be	Ca	Ca	Ge	Sn	Sn	Sn	2.963	0.245	Ca	Sr	Ba	Ba	Zr	Zr	Zr	Zr	3.414	0.299	Mg	Mg	Mg	Zn	Ti	Hf	Hf	Hf	3.921	1.121	
Be	Be	Ge	Ge	In	Y	Y	Y	2.238	0.691	Mg	Mg	Zn	Zn	Si	Si	Sn	Sn	2.963	0.186	Ca	Ca	Ca	Zn	Ge	Hf	Hf	Hf	3.414	0.562	Be	Mg	Mg	Mg	Sn	Sn	Sn	Hf	3.921	1.771	
Be	Ba	Zn	Zn	Sn	Sn	Sn	Sn	2.238	0.628	Cd	Cd	Cd	Cd	Si	Si	Ge	Ti	2.965	0.591	Be	Be	Ba	Ba	Si	Si	Si	Zr	3.414	0.212	Mg	Mg	Ba	Ba	Si	Si	Si	Ti	3.921	1.544	
Be	Ca	Sn	Sn	Y	Y	Y	Y	2.238	0.536	Ca	Sr	Cd	Cd	Si	Si	Si	Si	2.965	0.303	Sr	Ba	Ba	Ba	Si	Si	Zr	Zr	3.415	0.515	Mg	Ca	Zn	Zn	Zr	Zr	Zr	Zr	3.922	1.160	
Ba	Ba	Cd	Cd	Si	Si	Si	Hf	2.238	0.705	Sr	Sr	Zr	Zr	Al	Al	Sc	Sc	2.965	0.285	Sr	Sr	Ba	Ba	Ti	Ti	Ti	Zr	3.415	0.849	Ca	Ca	Ca	Ge	Ge	Sn	Hf	3.922	0.741		
Ba	Cd	Cd	Cd	Si	Si	Hf	Hf	2.239	0.552	Ba	Ba	Ti	Ti	Al	Al	Y	Y	2.965	0.672	Ca	Ca	Ca	Zn	Sn	Hf	Hf	Hf	3.416	0.507	Mg	Mg	Ca	Ca	Sn	Sn	Hf	Hf	3.922	0.854	
Cd	Cd	Cd	Ge	Ge	Sn	Sn	Hf	2.240	0.489	Sr	Sr	Si	Ge	Y	Y	Y	Y	2.966	0.214	Be	Be	Zn	Zn	Si	Zr	Zr	Zr	3.416	0.750	Ca	Ca	Ca	Ge	Ge	Ge	Ti	3.923	0.858		
Ca	Ca	Ca	Cd	Ge	Sn	Sn	Sn	2.240	0.707	Mg	Mg	Zr	Zr	Gi	In	In	In	2.967	0.273	Ca	Ca	Ca	Zn	Ge	Ge	Ge	Hf	3.416	0.246	Be	Sr	Sr	Sr	Ge	Ge	Ge	Hf	3.923	0.770	
Ba	Ba	Hf	Hf	In	In	Y	Y	2.240	0.533	Ba	Si	Si	Gi	Sc	Sc	Sc	Sc	2.967	0.682	Be	Sr	Sr	Sr	Sn	Sn	Ti	Ti	3.417	0.528	Be	Be	Zn	Zn	Si	Si	Hf	3.923	0.913		
Ba	Ba	Ge	Ge	Ca	Sc	Sc	Sc	2.241	0.479	Be	Be	Be	Cd	Sn	Sn	Ti	Ti	2.967	0.196	Sr	Sr	Sr	Sr	Ti	Zr	Hf	Hf	3.417	0.855	Al	Ga	Ga	Sc	Sc	Y	Y	Y	3.923	0.865	
Ba	Cd	Cd	Cd	Ti	Ti	Hf	Hf	2.241	0.733	Mg	Mg	Hf	Hf	Ca	Ga	Y	Y	2.968	0.270	Be	Be	Be	Be	Si	Si	Hf	Hf	3.417	0.545	Be	Be	Be	Mg	Ge	Ge	Sn	3.924	1.862		
Ba	Cd	Ge	Al	Al	Al	Al	Al	2.242	0.612	Mg	Mg	Cd	Cd	Ge	Ge	Ge	Hf	2.968	0.603	Cd	Cd	Si	Si	Sc	Sc	Sc	Y	3.417	0.783	Be	Be	Be	Be	Ti	Zr	Hf	Hf	3.924	1.795	
Ba	Ba	Ti	Ti	Gi	In	In	In	2.244	0.578	Cd	Cd	Cd	Cd	Ge	Zr	Hf	Hf	2.968	0.392	Mg	Ca	Ca	Ca	Ge	Sn	Sn	Sn	3.417	0.129	Be	Mg	Si	Si	Y	Y	Y	Y	3.926	1.657	
Sr	Sr	Ge	Sn	Sc	Sc	Sc	Sc	2.245	0.827	Cd	Cd	Cd	Cd	Si	Ti	Hf	Hf	2.968	0.338	Ga	Ga	Ga	In	Sc	Sc	Y	Y	3.418	0.401	Mg	Mg	Ti	Ti	Ga	Sc	Sc	Sc	3.927	0.844	
Sr	Sr	Sn	Hf	Al	Al	Al	Al	2.246	0.887	Be	Be	Be	Cd	Cd	Ge	Ge	Sn	2.968	0.625	Ca	Ba	Ba	Ge	Ge	Hf	Hf	Hf	3.418	0.697	Be	Be	Be	Mg	Ti	Ti	Hf	Hf	3.928	1.082	
Ca	Ca	Ge	Sn	Al	Al	Al	Al	2.246	0.769	Be	Be	Cd	Cd	Ge	Ge	Ge	Hf	2.968	0.447	Zn	Zn	Ge	Hf	Al	Al	Al	Al	3.418	0.397	Al	Ga	Ca	Sc	Sc	Sc	Y	Y	3.928	1.306	
Zn	Zn	Cd	Cd	Si	Si	Sn	Sn	2.246	0.828	Ba	Ba	Ba	Cd	Si	Si	Si	Ti	2.969	0.445	Zn	Cd	Cd	Cd	Si	Si	Si	Zr	3.418	0.631	Ca	Ca	Ba	Si	Si	Si	Hf	3.928	0.887		
Gi	In	In	In	In	In	Sc	Y	2.247	0.800	Ga	Ga	Zr	Zr	Ga	In	Sc	Y	2.969	0.687	Be	Be	Be	Ca	Ti	Hf	Hf	Hf	3.418	0.164	Be	Be	Mg	Mg	Sn	Sn	Zr	Zr	3.928	1.127	
Be	Be	Cd	Cd	Sn	Sn	Sn	Hf	2.247	0.737	Be	Be	Zr	Zr	Ga	Ga	Y	Y	2.969	0.339	Zn	Zn	Zn	Cd	Si	Ti	Ti	Ti	3.418	0.416	Be	Be	Be	Cd	Si	Si	Si	Ti	3.928	1.282	
Zn	Zn	Sn	Sn	Al	Al	Al	Y	2.247	0.827	Sr	Sr	Zn	Zn	Ge	Hf	Hf	Hf	2.970	0.433	Mg	Mg	Ca	Cd	Hf	Hf	Hf	Hf	3.418	0.706	Ca	Ca	Ca	Ca	Si	Ge	Zr	Zr	3.929	0.924	
Mg	Mg	Cd	Cd	Sn	Sn	Sn	Hf	2.247	0.778	Ca	Ca	Ba	Cd	Ti	Ti	Ti	Ti	2.970	0.693	Ca	Ca	Ba	Ba	Sn	Hf	Hf	Hf	3.418	0.435	Be	Sr	Sr	Sr	Si	Si	Si	Si	3.929	1.298	
Sr	Zn	Zn	Zn	Sn	Sn	In	Ti	2.247	0.730	Ca	Ca	Ca	Cd	Si	Si	Sn	Sn	2.970	0.317	Mg	Zn	Zn	Zn	Ge	Ge	Ge	Hf	3.419	0.666	Be	Mg	Mg	Zn	Ge	Ge	Ge	Ge	3.930	1.644	
Sr	Sr	Ti	Ti	Al	In	In	In	2.248	0.940	Sr	Zn	Zn	Zn	Zr	Zr	Zr	Hf	2.970	0.430	Sr	Sr	Sr	Ba	Ti	Ti	Ti	Hf	3.419	0.253	Mg	Mg	Sr	Sr	Si	Si	Si	Hf	3.930	0.939	
Sr	Sr	Ti	Ti	In	In	In	Sc	2.248	1.189	Zn	Cd	Cd	Cd	Si	Si	Si	Sn	2.970	0.729	Ca	Ca	Ba	Ba	Zr	Hf	Hf	Hf	3.419	0.475	Mg	Sr	Zn	Zn	Si	Si	Si	Si	3.930	1.337	
Ba	Zn	Zn	Sn	Sn	Sn	Zr	Zr	2.248	1.078	Sr	Zn	Zn	Zn	Si	Si	Hf	Hf	2.971	0.823	Cd	Cd	Ti	Ti	Al	Al	Al	Sc	3.419	0.715	Mg	Sr	Zn	Ti	Al	Al	Al	Al	3.931	1.634	
Sr	Sr	Cd	Cd	Si	Si	Ge	Ge	2.249	0.929	Cd	Cd	Zr	Zr	In	Sc	Sc	Sc	2.972	0.840	Ca	Ba	Ba	Ba	Zr	Hf	Hf	Hf	3.420	0.463	Mg	Mg	Mg	Sr	Si	Ti	Ti	Ti	3.931	0.711	
Sr	Sr	Ti	Ti	Gi	In	In	In	2.249	1.120	Be	Be	Si	Ti	In	In	In	In	2.972	0.771	Ca	Ca	Zr	Hf	Al	Al	Al	Al	3.420	0.656	Mg	Mg	Mg	Ba	Si	Si	Si	Hf	3.931	0.803	
Ba	Ba	Zn	Zn	Ge	Ge	Hf	Hf	2.249	1.055	Zn	Zn	Ti	Ti	In	In	Sc	Sc	2.973	0.714	Ca	Sr	Sr	Sr	Sn	Sn	Sn	Ti	3.420	-0.019	Ca	Ca	Sr	Sr	Si	Si	Si	Zr	3.931	0.803	
Be	Be	Be	Cd	Ge	Sn	Sn	Sn	2.250	0.926	Mg	Mg	Mg	Mg	Ba	Sn	Sn	Hf	2.974	0.818	Ca	Ca	Si	Zr	Y	Y	Y	Y	3.421	0.679	Mg	Mg	Mg	Zn	Sn	Si	Si	Hf	3.932	0.878	
Be	Cd	Cd	Cd	Ge	Sn	Sn	Sn	2.253	1.100	Be	Ca	Ca	Cd	Hf	Hf	Hf	Hf	2.974	0.774	Mg	Mg	Zr	Zr	Ga	Ga	Ga	Y	3.422	1.103	Al	Al	Al	Al	Ga	In	Y	3.932	0.780		
Sr	Sr	Zn	Cd	Ge	Ge	Ge	Ge	2.253	1.049	Ca	Ca	Ca	Cd	Sn	Zr	Zr	Zr	2.974	0.691	Be	Cd	Cd	Cd	Ti	Ti	Ti	Hf	3.422	-0.073	Mg	Mg	Mg	Zn	Si	Si	Zr	Zr	3.932	0.569	
Ba	Ba	Hf	Hf	Al	In	In	In	2.256	0.658	Be	Sr	Sr	Sr	Ge	Ge	Ge	Sn	2.975	0.813	Be	Be	Ti	Hf	Y	Y	Y	Y	3.422	0.038	Be	Zn	Zn	Zn	Si	Si	Zr	Zr	3.933	1.063	
Zn	Zn	Cd	Cd	Sn	Sn	Sn	Ti	2.256	0.631	Sr	Sr	Zn	Zn	Ge	Ge	Zr	Zr	2.976	0.825	Ca	Sr	Ti	Ti	Sc	Sc	Sc	Sc	3.422	0.212	Be	Ba	Zn	Zn	Si	Si	Si	Si	3.935	0.924	
Sr	Sr	Hf	Hf	In	In	Y	Y	2.258	0.582	Ca	Sr	Cd	Cd	Zr	Zr	Zr	Zr	2.976	0.702	Ca	Zn	Zr	Zr	Y	Y	Y	Y	3.422	0.840	Be	Be	Zr	Zr	Ga	Ga	Ga	Sc	3.936	0.570	
Cd	Cd	Cd	Cd	Ge																																				

Sr	Sr	Cd	Cd	Si	Si	Ti	Ti	2.309	0.220	Mg	Cd	Hf	Hf	Ga	Ga	Ga	3.002	0.486	Be	Cd	Cd	Cd	Ge	Ge	Ti	Ti	3.436	1.047	Mg	Mg	Zn	Zn	Si	Si	Ti	Ti	3.975	0.545	
Mg	Ba	Si	Si	Si	Ga	Ga	Ga	2.309	0.955	Sr	Sr	Sr	Zn	Si	Si	Sn	3.003	0.630	Be	Be	Be	Sr	Si	Ti	Ti	Ti	3.436	1.303	Be	Be	Zr	Zr	Al	Al	Al	Y	3.976	0.545	
Ca	Cd	Sn	Sn	Sn	Sc	Sc	Sc	2.309	0.346	Be	Be	Ge	Ge	Ga	Ga	In	3.003	0.688	Cd	Cd	Si	Si	Al	Sc	Sc	Sc	3.436	0.450	Be	Be	Mg	Ca	Ti	Ti	Ti	Ti	3.977	0.654	
Ca	Ba	Ba	Zn	Sn	Sn	Sn	Sn	2.312	0.218	Zn	Cd	Zr	Zr	Y	Y	Y	3.003	0.453	Ca	Ca	Sr	Ba	Zr	Zr	Zr	Zr	3.436	0.325	Al	Mg	Si	Si	Al	Al	Al	Y	3.977	0.835	
Zn	Zn	Sn	Sn	Sn	Sc	Sc	Y	2.312	0.678	Sr	Sr	Ti	Ti	Al	Al	Al	3.003	0.621	Mg	Sr	Si	Si	Al	Al	Al	Al	3.436	0.363	Al	Al	Ga	Ga	Sc	Sc	Y	3.978	0.616		
Zn	Zn	Ge	Ge	Ga	Ga	Ga	Sc	2.313	0.636	Ca	Ca	Ca	Zn	Sn	Sn	Sn	3.005	0.763	Zn	Zn	Cd	Cd	Si	Si	Ti	Ti	3.436	0.524	Be	Mg	Mg	Zn	Zr	Zr	Zr	Zr	3.978	0.702	
Be	Ba	Ba	Cd	Cd	Ge	Ge	Ge	2.313	0.611	Sr	Sr	Ti	Ti	Al	Al	Al	3.005	0.933	Mg	Ba	Ba	Ba	Si	Si	Ge	Ge	3.436	0.751	Mg	Mg	Mg	Zn	Zr	Ge	Ge	Ge	3.979	0.802	
Sr	Sr	Ge	Ge	Al	Al	Sc	Sc	2.313	0.928	Zn	Zn	Zn	Cd	Sn	Hf	Hf	3.005	0.917	Be	Zn	Ti	Ti	Ga	Ga	Ga	3.437	0.256	Mg	Mg	Hf	Hf	Al	Al	Sc	Sc	3.980	0.564		
Sr	Sr	Zr	Zr	In	In	Y	Y	2.314	0.654	Be	Be	Cd	Cd	Ge	Ge	Ge	3.005	0.714	Zn	Zn	Zn	Sn	Si	Si	Ti	Ti	3.437	0.182	Be	Be	Mg	Mg	Sn	Hf	Hf	Hf	3.981	0.619	
Ba	Cd	Cd	Cd	Ti	Ti	Ti	Zr	2.315	0.602	Ca	Zn	Ti	Ti	Ga	Ga	Ga	3.005	0.766	Zn	Zn	Si	Si	In	Sc	Sc	Sc	3.437	0.471	Mg	Mg	Mg	Zn	Ti	Ti	Ti	Hf	3.983	0.575	
Sr	Zn	Zn	Sn	Sn	Hf	Hf	3.005	0.965	Ca	Ca	Ca	Cd	Zr	Zr	Zr	3.005	0.870	Ca	Ca	Sr	Sr	Sn	Hf	Hf	Hf	3.437	0.505	Mg	Mg	Zr	Hf	Sc	Sc	Sc	Sc	3.983	-0.262		
Cd	Cd	Ge	Ge	Al	Al	Al	Al	2.315	0.652	Zn	Cd	Cd	Cd	Si	Si	Ge	3.005	0.706	Zn	Zn	Ge	Zr	Sc	Sc	Sc	Sc	3.437	0.704	Mg	Mg	Sr	Sr	Si	Si	Ti	Ti	3.983	0.440	
Sr	Sr	Sn	Zr	Al	Al	Al	Al	2.316	0.599	Sr	Ba	Zr	Zr	Al	Al	Al	3.006	0.733	Mg	Sr	Ba	Ba	Ge	Ge	Ge	Ge	3.437	0.424	Be	Be	Be	Ge	Ge	Ge	Zr	Zr	3.983	0.877	
Ca	Ba	Si	Si	Si	Ga	Ga	In	2.317	0.913	Be	Be	Hf	Hf	Ga	In	In	3.006	0.861	Be	Be	Mg	Mg	Ge	Sn	Sn	Sn	3.438	0.347	Mg	Mg	Ti	Ti	Al	Al	Al	Y	3.984	-0.187	
Ba	Ba	Cd	Cd	Ti	Ti	Ti	Hf	2.318	0.732	Sr	Sr	Zr	Zr	Sc	Sc	Sc	3.006	0.583	Mg	Mg	Cd	Cd	Ge	Ti	Ti	Ti	3.438	0.496	Be	Be	Be	Ca	Si	Si	Si	Hf	3.986	0.043	
Zn	Zn	Zn	Cd	Sn	Sn	Sn	Ti	2.320	0.624	Ca	Ca	Ti	Zr	Ga	Ga	Ga	3.006	0.481	Sr	Ba	Ba	Ba	Si	Zr	Zr	Zr	3.438	0.512	Mg	Cd	Ti	Ti	Al	Al	Al	Al	3.987	0.059	
Ca	Cd	Si	Si	Si	Ga	Ga	Ga	2.321	0.954	Ba	Ba	Ba	Zn	Ti	Ti	Ti	3.007	0.531	Be	Be	Be	Ba	Si	Si	Si	Sn	3.439	0.707	Ca	Ca	Ca	Ca	Ge	Zr	Zr	Hf	3.987	0.792	
Ca	Ba	Si	Si	Si	Ga	Ga	Ga	2.321	0.743	Cd	Cd	Cd	Cd	Si	Si	Zr	3.007	0.580	Ca	Ca	Ca	Sn	Si	Hf	Hf	Hf	3.439	0.457	Be	Be	Be	Be	Si	Ge	Zr	Zr	3.988	1.224	
Ca	Ca	Zn	Zn	Sn	Sn	Sn	Hf	2.322	0.622	Zn	Zn	Cd	Cd	Sn	Hf	Hf	3.007	0.457	Be	Sr	Sr	Sr	Sn	Sn	Sn	Zr	3.439	0.378	Be	Be	Be	Be	Ti	Ti	Zr	Hf	3.988	0.073	
Ca	Zn	Sn	Sn	Al	Al	Al	Al	2.322	0.986	Ca	Ca	Zr	Zr	Ga	Ga	Sc	3.007	0.519	Be	Be	Be	Ca	Ti	Ti	Hf	Hf	3.439	0.846	Ca	Ca	Ca	Ca	Si	Si	Sn	Zr	3.988	0.250	
Ca	Zn	Zr	Zr	In	In	In	In	2.324	0.961	Be	Be	Cd	Cd	Sn	Sn	Ti	3.008	0.570	Ca	Sr	Sr	Sr	Ti	Ti	Ti	Hf	3.440	1.218	Be	Be	Be	Mg	Ti	Ti	Zr	Zr	3.988	0.508	
Zn	Zn	Zr	Zr	Ga	In	In	In	2.324	0.944	Ca	Ca	Cd	Cd	Si	Si	Ge	3.008	0.553	Be	Zn	Cd	Cd	Zr	Zr	Zr	Zr	3.440	1.468	Be	Ba	Ba	Ba	Si	Si	Si	Ti	3.989	1.152	
Sr	Sr	Zr	Zr	Al	In	In	In	2.325	0.812	Ba	Ca	Si	Hf	Sc	Sc	Sc	3.008	0.559	Be	Be	Be	Ca	Zr	Zr	Zr	Hf	3.440	0.569	Be	Be	Be	Be	Sn	Ti	Ti	Zr	3.989	1.542	
Mg	Mg	Ca	Cd	Sn	Sn	Sn	Sn	2.325	0.713	Sr	Sr	Hf	Hf	Sc	Y	Y	3.009	0.627	Be	Ba	Ba	Ba	Ba	Sn	Zr	Zr	Zr	3.441	0.409	Mg	Mg	Mg	Zn	Ge	Ge	Ge	Ti	3.990	0.490
Be	Ca	Hf	Hf	In	In	In	In	2.326	0.767	Be	Be	Ti	Zr	In	In	In	3.009	0.569	Be	Be	Be	Ca	Zr	Hf	Hf	Hf	3.441	0.499	Mg	Mg	Si	Ge	Sc	Sc	Sc	Sc	3.993	0.590	
Zn	Zn	Si	Si	Si	In	In	In	2.326	0.843	Be	Ba	Zr	Zr	Sc	Sc	Sc	3.010	0.610	Zn	Zn	Zn	Zn	Si	Si	Ge	Hf	3.442	0.674	Ca	Ca	Ca	Ca	Ti	Zr	Hf	Hf	3.994	0.076	
Sr	Sr	Sr	Cd	Cd	Sn	Sn	Zr	2.327	0.640	Mg	Sr	Hf	Hf	Y	Y	Y	3.010	0.641	Mg	Zn	Zn	Zn	Ge	Ge	Hf	Hf	3.442	0.893	Be	Zn	Zn	Zn	Ge	Ti	Ti	Ti	3.994	0.473	
Ca	Ca	Ti	Hf	In	In	In	In	2.329	0.646	Be	Be	Be	Ba	Si	Hf	Hf	3.010	0.496	Ca	Ca	Ba	Ba	Ge	Hf	Hf	Hf	3.442	0.351	Ca	Ca	Ca	Sr	Si	Si	Si	Hf	3.995	0.798	
Be	Be	Ge	Ge	In	In	In	Y	2.330	0.964	Be	Be	Be	Ba	Zr	Zr	Zr	3.011	0.476	Ca	Ca	Ba	Zn	Hf	Hf	Hf	Hf	3.442	0.242	Be	Be	Ca	Ca	Si	Ti	Ti	Ti	3.995	0.193	
Ca	Ca	Cd	Cd	Ge	Ge	Ge	Zr	2.331	0.936	Mg	Ba	Cd	Cd	Ti	Ti	Ti	3.011	0.872	Sr	Zn	Zr	Zr	Sc	Sc	Sc	Sc	3.443	0.594	Be	Be	Ca	Ca	Sn	Sn	Ti	Ti	3.996	0.354	
Sr	Zn	Si	Si	Si	Ga	Ga	Ga	2.331	0.820	Ba	Ba	Zr	Zr	Sc	Y	Y	3.011	0.855	Be	Be	Be	Ca	Si	Zr	Zr	Zr	3.443	0.642	Mg	Mg	Si	Ti	Y	Y	Y	Y	3.996	0.298	
Ba	Ba	Ti	Ti	Ti	In	In	Y	2.332	0.959	Ba	Ba	Zn	Zn	Ge	Ge	Ge	3.011	0.789	Be	Ca	Ca	Ca	Ge	Ge	Sn	Sn	3.443	0.834	Mg	Mg	Si	Ti	Sc	Y	Y	Y	3.996	0.519	
Be	Mg	Mg	Cd	Sn	Sn	Sn	Sn	2.335	0.869	Be	Be	Ge	Ba	Ga	Ga	Ga	3.011	0.802	Be	Be	Be	Ba	Si	Si	Ge	Ge	3.443	0.506	Mg	Mg	Mg	Zn	Zr	Hf	Hf	Hf	3.996	0.764	
Sr	Sr	Sn	Zr	Al	In	In	Sn	2.336	0.777	Ca	Ca	Ba	Cd	Hf	Hf	Hf	3.012	0.758	Ca	Ca	Ca	Zn	Ge	Ge	Ge	Ge	3.443	0.397	Be	Be	Be	Be	Ge	Sn	Ti	Ti	3.998	0.425	
Zn	Zn	Ti	Ti	Al	In	In	In	2.337	0.957	Be	Zn	Zn	Zn	Si	Si	Sn	3.012	0.794	Be	Sr	Sr	Zn	Zr	Zr	Zr	Zr	3.443	0.617	Mg	Mg	Mg	Mg	Si	Ge	Sn	Sn	3.998	0.546	
Ca	Zn	Zn	Zn	Ge	Ge	Sn	Sn	2.338	0.850	Ca	Ca	Zr	Zr	Al	Al	Y	3.012	0.785	Be	Ba	Ba	Ba	Ba	Sn	Ti	Ti	Ti	3.443	0.647	Ca	Ca	Ca	Ca	Ge	Ti	Zr	Zr	3.991	0.341
Sr	Sr	Si	Si	Al	Ga	Ga	Ga	2.338	0.767	Ca	Cd	Cd	Cd	Si	Ti	Ti	3.013	0.733	Ca	Ca	Ca	Zn	Sn	Zr	Zr	Zr	3.444	0.835	Be	Zn	Hf	Hf	Al	Al	Al	Al	4.001	0.539	
Cd	Cd	Ge	Sn	Al	Al	Al	Al	2.339	0.984	Ca	Ca	Cd	Cd	Hf	Hf	Hf	3.013	0.791	Mg	Mg	Ba	Ba	Ba	Sn	Sn	Zr	3.444	0.537	Be	Cd	Ti	Ti	Al	Al	Al	Al	4.001	0.771	
Zn	Ca	Hf	Hf	In	In	Y	Y	2.339	0.878	Zn	Zn	Cd	Cd	Ge	Ge	Ti	3.013	0.743	Ca	Ca	Ca	Zn	Ge	Zr	Zr	Zr	3.445	0.427	Be	Be	Zr	Zr	Al	Al	Al	In	4.004	0.461	
Ca	Ca	Ge	Hf	Ga	Ga	Ga	Y	2.339	0.838	Be	Be	Be	Ba	Ti	Ti	Ti	3.015	0.656	Sr	Sr	Ba	Ba	Si	Zr	Zr	Zr	3.445	0.702	Be	Ca	Zn	Zn	Hf	Hf	Hf	Hf	4.004	0.587	
Ca	Ca	Hf	Hf	In	In	In	Y	2.339	1.108	Mg	Mg	Zr	Zr	Al	In	In	3.015	0.601	Mg	Mg	Mg	Ba	Ba	Sn	Zr	Zr	Zr	3.445	0.880	Mg	Ba	Ba	Ba	Si	Si	Si	Ti	4.005	0.330
Ba	Ba	Zr	Zr	Ga	In	In	In	2.339	1.197	Be	Be	Zr	Zr	In	In	In	3.016	0.958	Be	Be	Si	Ti	Ti	Ti	Ti	Hf	Hf	3.445	1.077	Be	Be	Si	Si	In	Sc	Sc	Sc	4.007	0.956
Sr	Ba	Ba	Zn	Sn	Sn	Sn	Sn	2.339	1.053	Mg	Cd	Ge	Ge	Y	Y	Y	3.016	1.005	Ca	Sr	Sr	Ba	Zr	Zr	Zr	Zr	3.445	0.489	Ca	Ca	Ca	Ca	Si	Ti	Hf	Hf	4.007	1.315	
Ba	Ba	Cd	Cd	Ti	Ti	Ti	Zr	2.339	1.090	Sr	Sr	Zn	Zn	Si	Si	Si	3.016	0.938	Be	Cd	Cd	Cd	Sn	Ti	Ti	Ti	Ti	3.445	0.324	Be	Be	Ca	Ca	Ge	Ti	Ti	Ti	4.007	0.210
Sr	Sr	Ti	Ti	In	In	Y	Y	2.340	1.120	Ba	Ba	Zn	Zn	Ge	Ti	Ti	3.016	0.869	Be	Be	Be	Sr	Si	Ge	Ge	Ge	3.445	0.766	Be	Be	Si	Ti	Ga	Ga	Ga	Ga	4.009	0.640	
Sr	Sr	Zr	Zr	In	In	In	Sc	2.340	1.026	Be	Be	Sn	Sn	Ga	Sc	Sc	3.017	0.890	Ca	Ca	Sr	Sr	Ti	Ti	Ti	Hf	Hf	3.446	0.817	Be	Be	Be	Be	Ge	Ge	Ti	Hf	4	

Zn	Zn	Ge	Ge	Ga	Y	Y	Y	2.387	0.334	Cd	Cd	Zr	Zr	Al	Al	Sc	Sc	3.036	0.785	Sr	Sr	Sr	Sr	Si	Si	Zr	Hf	3.463	1.033	Be	Be	Be	Be	Ge	Ti	Ti	Zr	4.059	0.812
Mg	Mg	Ge	Ge	In	In	Sc	Sc	2.387	0.167	Ba	Ba	Ti	Ti	Hf	Y	Y	Y	3.036	0.762	Sr	Sr	Sr	Sr	Si	Si	Sn	Zr	3.463	0.996	Be	Ca	Ca	Ca	Si	Si	Zr	4.059	1.025	
Ba	Ba	Cd	Cd	Si	Si	Si	Ti	2.388	0.975	Mg	Mg	Zr	Zr	Ga	Ga	Y	Y	3.036	0.706	Ca	Ca	Ca	Sr	Sn	Sn	Ti	Zr	3.464	1.116	Ca	Be	Ca	Ca	Sn	Ti	Zr	4.060	1.166	
Sr	Sr	Cd	Cd	Ti	Si	Si	Zr	2.389	0.365	Ca	Ca	Cd	Cd	Zr	Hf	Hf	Hf	3.036	0.712	Ca	Ca	Ti	Ti	Sc	Sc	Sc	Y	3.464	0.843	Ca	Ca	Ca	Ba	Si	Si	Ti	4.062	1.377	
Ba	Ba	Cd	Cd	Ti	Ti	Ti	Zr	2.389	0.159	Ba	Ba	Cd	Cd	Zr	Ge	Hf	Hf	3.037	0.657	Ca	Ca	Si	Zr	Sc	Sc	Sc	Y	3.464	0.630	Mg	Mg	Mg	Mg	Ge	Sn	Sr	4.063	1.012	
Ca	Ca	Hf	Hf	In	In	Y	Y	2.391	1.015	Ca	Ca	Si	Si	Al	Al	Al	Y	3.037	0.710	Ca	Ca	Ca	Ba	Ti	Ti	Zr	Zr	3.464	1.052	Be	Sr	Zn	Zn	Si	Si	Si	4.064	0.967	
Zn	Zn	Hf	Hf	In	In	In	Y	2.391	0.367	Be	Be	Be	Cd	Ge	Ge	Y	Zr	3.037	0.694	Sr	Sr	Sr	Sr	Si	Ti	Hf	Hf	3.465	0.998	Mg	Zn	Zn	Zn	Si	Si	Ti	4.064	1.046	
Ba	Ba	Cd	Cd	Sn	Ti	Ti	Ti	2.391	0.157	Be	Be	Be	Ba	Si	Zr	Zr	Zr	3.037	0.630	Ca	Ca	Ca	Zn	Si	Zr	Zr	Zr	3.465	1.115	Mg	Mg	Ca	Ca	Sn	Zr	Zr	4.064	1.165	
Ba	Cd	Cd	Cd	Sn	Hf	Hf	Hf	2.393	0.517	Sr	Sr	Zr	Zr	Al	Sc	Sc	Sc	3.038	0.706	Ca	Cd	Zr	Zr	Al	Al	Al	Al	3.465	0.870	Mg	Mg	Mg	Ca	Ge	Ge	Hf	4.065	1.370	
Al	Ga	In	In	In	In	In	Sc	2.393	0.343	Mg	Mg	Hf	Hf	In	In	In	Sc	3.038	0.651	Mg	Mg	Ba	Ba	Zr	Zr	Zr	Hf	3.467	0.657	Al	Al	Al	Ga	Ge	Sc	Y	4.067	1.040	
Zn	Zn	Zr	Zr	In	In	Y	Y	2.395	0.236	Zn	Cd	Cd	Cd	Sn	Zr	Zr	Zr	3.038	0.562	Ca	Ca	Ba	Ba	Ti	Ti	Ti	Hf	3.467	0.852	Mg	Mg	Zr	Zr	Al	Al	Sc	4.069	0.995	
Sr	Sr	Sr	Cd	Sn	Sn	Sn	Hf	2.395	0.722	Zn	Zn	Zn	Zn	Ge	Ge	Sn	Ti	3.039	0.511	Ca	Sr	Sr	Ba	Hf	Hf	Hf	Hf	3.467	0.772	Mg	Mg	Mg	Sr	Si	Si	Ti	4.071	-0.084	
Cd	Cd	Zr	Zr	Ga	Ga	Ga	In	2.396	0.426	Ca	Zn	Zr	Zr	Ga	Ga	Ga	Ga	3.040	0.863	Ca	Ba	Ba	Ba	Si	Si	Hf	Hf	3.467	0.888	Mg	Mg	Mg	Zn	Sn	Ti	Ti	4.072	0.652	
Ba	Ba	Ba	Cd	Sn	Sn	Sn	Zr	2.396	0.325	Ba	Ba	Ba	Zn	Si	Hf	Hf	Hf	3.040	0.902	Sr	Sr	Sr	Sr	Ge	Sn	Sn	Zr	3.467	0.714	Ca	Ca	Ca	Ca	Ge	Ti	Hf	4.072	1.100	
Mg	Ca	Sn	Sn	Sn	Sc	Sc	Sc	2.397	0.980	Sr	Sr	Sr	Zn	Si	Ge	Ge	Ge	3.040	0.847	Mg	Mg	Ba	Ba	Zr	Zr	Hf	Hf	3.467	0.540	Al	Al	Ga	Ga	Sc	Y	Y	4.074	0.015	
Ba	Cd	Cd	Cd	Sn	Zr	Zr	Zr	2.397	0.430	Mg	Mg	Mg	Zn	Sn	Sn	Sn	Hf	3.040	0.769	Mg	Mg	Ge	Ge	Al	Al	Al	Al	3.469	0.869	Be	Be	Be	Ca	Si	Si	Ti	4.075	0.260	
Ba	Ba	Ba	Cd	Ge	Ge	Zr	Zr	2.397	0.316	Ca	Ca	Zr	Zr	Al	Ga	Ga	Ga	3.040	0.777	Ca	Ca	Sr	Sr	Ge	Ge	Hf	Hf	3.469	0.772	Mg	Mg	Mg	Sr	Si	Si	Zr	4.075	0.204	
Ca	Ca	Ge	Ge	In	Sc	Sc	Sc	2.398	1.016	Be	Be	Ba	Zn	Zr	Zr	Zr	Zr	3.040	0.860	Ca	Ca	Ti	Zr	Al	Al	Al	Al	3.469	0.884	Be	Ba	Ba	Ba	Si	Si	Zr	4.078	0.971	
Sr	Cd	Cd	Cd	Ti	Ti	Zr	Zr	2.398	0.428	Sr	Zn	Zn	Zn	Si	Si	Si	Hf	3.041	0.749	Zn	Zn	Zn	Zn	Sn	Ti	Ti	Hf	3.470	0.739	Mg	Mg	Sr	Sr	Si	Si	Ti	4.079	1.416	
Ca	Ca	Cd	Cd	Si	Ge	Ge	Ge	2.399	0.314	Ba	Cd	Hf	Hf	Y	Y	Y	Y	3.041	0.747	Be	Be	Zn	Zn	Zr	Zr	Hf	Hf	3.470	0.565	Be	Be	Mg	Mg	Si	Hf	Hf	4.079	0.249	
Ba	Ba	Ge	Hf	Al	Al	Al	Al	2.400	0.763	Be	Be	Cd	Cd	Sn	Sn	Ti	Ti	3.041	0.858	Mg	Sr	Ti	Ti	Sc	Sc	Sc	Sc	3.470	0.923	Be	Be	Be	Mg	Ti	Ti	Ti	Hf	4.080	0.446
Cd	Cd	Ge	Ge	Al	Y	Y	Y	2.400	0.720	Ca	Ca	Ca	Cd	Ge	Ge	Ti	Ti	3.041	0.954	Be	Be	Be	Mg	Sn	Sn	Sn	Ti	3.470	0.817	Mg	Ca	Ca	Ca	Sn	Hf	Hf	4.081	0.638	
Sr	Sr	Zn	Zn	Ge	Ge	Zr	Zr	2.401	0.701	Cd	Cd	Si	Si	Al	Y	Y	Y	3.042	1.099	Mg	Mg	Ge	Ge	Sc	Sc	Sc	Y	3.470	0.916	Mg	Mg	Ge	Ti	Sc	Sc	Sc	4.082	1.313	
Ca	Ca	Ge	Zr	Ga	Ga	Ga	Ga	2.401	0.994	Zn	Zn	Zn	Zn	Si	Si	Sn	Hf	3.042	1.088	Be	Be	Zn	Zn	Ti	Zr	Zr	Zr	3.470	0.787	Be	Ca	Sr	Sr	Si	Si	Si	4.084	1.714	
Be	Cd	Cd	Cd	Sn	Sn	Sn	Zr	2.401	0.727	Ba	Cd	Hf	Hf	Al	Al	Al	Al	3.042	0.851	Al	Al	Ga	Ga	Ga	Ga	In	Sc	3.471	0.608	Ca	Ca	Ca	Ca	Ge	Ge	Ti	Zr	4.085	0.653
Mg	Ba	Ge	Ge	Al	Al	Al	Al	2.401	0.689	Ca	Ca	Si	Si	Ge	Y	Y	Y	3.042	0.969	Mg	Mg	Ti	Ti	Ga	Ga	Ca	In	3.471	0.776	Be	Ca	Ca	Ca	Si	Si	Sn	4.085	0.776	
Sr	Sr	Sc	Cd	Ge	Ge	Ge	Sn	2.403	1.027	Cd	Cd	Cd	Cd	Ge	Ge	Ti	Zr	3.043	1.092	Ca	Ca	Ba	Ba	Ti	Ti	Ti	Zr	3.472	1.027	Be	Be	Be	Be	Si	Si	Sn	Ti	4.085	0.283
Mg	Cd	Cd	Cd	Sn	Sn	Sn	Ti	2.403	0.723	Be	Be	Be	Ba	Ge	Ge	Hf	Hf	3.043	0.829	Ca	Zn	Zn	Zn	Si	Ti	Ti	Ti	3.472	1.196	Be	Cd	Si	Si	Al	Al	Al	4.086	0.706	
Sr	Sr	Ge	Sn	Y	Y	Y	Y	2.404	0.686	Be	Sr	Sr	Sr	Si	Si	Sn	Sn	3.043	0.937	Be	Be	Mg	Mg	Sn	Sn	Sn	Hf	3.473	0.475	Be	Ca	Ca	Ca	Sn	Hf	Hf	4.086	1.035	
Be	Be	Ba	Ba	Si	Sn	Sn	Sn	2.405	0.982	Ca	Zn	Zr	Zr	Ga	Ga	Ga	Y	3.043	1.089	Zn	Zn	Zn	Zn	Si	Si	Ge	Zr	3.473	0.309	Mg	Mg	Mg	Ca	Y	Ti	Zr	4.087	0.420	
Ca	Ca	Cd	Cd	Si	Si	Si	Sn	2.405	0.809	Zn	Zn	Zn	Zn	Ge	Sn	Zr	Zr	3.043	0.769	Be	Be	Be	Zn	Ti	Ti	Ti	Hf	3.473	0.944	Mg	Mg	Mg	Ca	Ge	Ge	Zr	4.087	0.590	
Mg	Ca	Hf	Hf	In	In	In	In	2.406	0.708	Cd	Cd	Si	Ge	Al	Al	Al	Al	3.044	0.749	Mg	Mg	Mg	Cd	Si	Si	Hf	Hf	3.473	1.137	Mg	Mg	Ca	Ca	Zr	Zr	Hf	4.087	0.512	
Be	Zn	Hf	Hf	In	In	In	In	2.407	1.020	Be	Be	Hf	Hf	Al	Al	Y	Y	3.044	0.786	Mg	Zn	Zr	Zr	Y	Y	Y	Y	3.474	1.301	Be	Ba	Ba	Ba	Si	Si	Si	Hf	4.088	0.753
Sr	Sr	Si	Hf	Ga	Ga	Ga	Ga	2.407	0.819	Be	Be	Cd	Cd	Ge	Ge	Hf	Hf	3.044	0.755	Ba	Ba	Ba	Ba	Ge	Sn	Sn	Hf	3.474	0.665	Be	Be	Ge	Sn	Al	Al	Al	4.089	0.997	
Sr	Sr	Sr	Zn	Ge	Sn	Sn	Sn	2.407	0.705	Ba	Ba	Ba	Zn	Sn	Hf	Hf	Hf	3.045	0.728	Ba	Ba	Ba	Ba	Si	Si	Ge	Sn	3.474	0.481	Be	Zn	Zr	Sr	Al	Al	Al	4.089	0.656	
Cd	Cd	Cd	Cd	Si	Si	Ge	Sn	2.408	1.053	Be	Sr	Ti	Ti	Y	Y	Y	Y	3.045	0.777	Mg	Mg	Mg	Sr	Ge	Ge	Ge	Sn	3.474	0.708	Al	Al	Ga	Sc	Y	Y	Y	4.089	0.783	
Zn	Zn	Sn	Zr	Ga	Ga	Ga	Ga	2.408	1.029	Ba	Ba	Si	Si	Al	Al	Sc	Sc	3.045	0.810	Sr	Sr	Sr	Sr	Si	Si	Ge	Sn	3.474	0.716	Mg	Si	Ge	Al	Al	Al	4.089	0.555		
Sr	Sr	Cd	Cd	Ti	Ti	Ti	Hf	2.409	1.014	Ca	Ca	Zr	Zr	Ga	Ga	Sc	Sc	3.046	0.805	Mg	Sr	Sr	Sr	Zn	Ti	Ti	Ti	3.474	0.857	Be	Be	Mg	Mg	Ge	Zr	Zr	4.090	0.770	
Sr	Sr	Sc	Cd	Sn	Sn	Sn	Zr	2.410	0.081	Be	Be	Be	Ba	Ti	Ti	Zr	Zr	3.046	0.812	Be	Sr	Sr	Zn	Hf	Hf	Hf	Hf	3.475	0.553	Be	Be	Be	Be	Si	Ti	Ti	Hf	4.093	1.002
Mg	Ba	Cd	Cd	Cd	Ge	Ge	Ge	2.410	-0.049	Be	Be	Cd	Cd	Ge	Ge	Hf	Hf	3.046	0.269	Ba	Zn	Ti	Ti	Sc	Sc	Sc	Sc	3.475	0.411	Mg	Ca	Ca	Ca	Sn	Zr	Zr	4.093	0.697	
Ca	Ca	Zr	Hf	In	In	In	In	2.411	-0.088	Mg	Mg	Ge	Hf	Ga	Ga	Ga	Ga	3.046	0.182	Zn	Cd	Hf	Hf	Al	Al	Al	Al	3.475	0.827	Be	Ca	Ca	Ca	Sn	Zr	Zr	4.094	0.817	
Sr	Cd	Cd	Cd	Si	Si	Zr	Zr	2.412	0.393	Zn	Zn	Zr	Hf	Ga	Ga	Ga	Ga	3.047	0.183	Ca	Cd	Ti	Ti	Y	Y	Y	Y	3.476	0.722	Mg	Mg	Ca	Ca	Zr	Zr	Zr	4.094	0.152	
Ca	Ca	Si	Si	Ga	Ga	Ga	In	2.412	0.015	Mg	Cd	Ti	Ti	Ga	Ga	Ga	Ga	3.047	0.209	Zn	Zn	Sn	Ti	Al	Al	Al	Al	3.477	0.843	Ca	Ca	Ca	Si	Si	Sn	Ti	4.094	0.888	
Al	Ga	Ga	In	In	In	Y	Y	2.412	-0.109	Be	Be	Be	Ca	Ge	Ge	Sn	Sn	3.047	0.519	Ca	Ca	Zn	Zn	Zr	Zr	Hf	Hf	3.477	0.732	Al	Ga	Ga	In	Sc	Sc	Sc	4.095	1.319	
Ba	Ba	Cd	Cd	Sn	Zr	Zr	Zr	2.413	0.314	Ca	Ba	Ba	Zn	Ge	Ge	Ge	Ge	3.047	0.149	Mg	Mg	Mg	Ba	Sn	Sn	Ti	Ti	3.477	0.588	Be	Mg	Ca	Ca	Zr	Zr	Zr	4.095	0.190	
Ba	Ba	Ge	Ge	Al	Sc	Sc	Sc	2.413	-0.072	Ba	Ba	Ba	Zn	Si	Si	Ge	Ge	3.048	0.620	Ba	Ba	Ba	Ba	Si	Si	Sn	Hf	3.477	0.853	Mg	Mg</								

Mg	Zn	Ti	Ti	In	In	In	In	2.456	0.887	Be	Be	Ge	Ge	Ga	Ga	Ga	Y	3.074	1.160	Be	Be	Be	Mg	Ge	Ge	Sn	Sn	3.497	0.597	Be	Mg	Mg	Mg	Sn	Sn	Hf	Hf	4.148	0.548	
Be	Be	Sn	Hf	In	In	In	In	2.457	0.718	Mg	Mg	Mg	Mg	Zn	Sn	Sn	Sn	3.074	0.854	Sr	Sr	Sr	Sr	Sn	Ti	Ti	Zr	3.498	0.354	Mg	Mg	Ca	Ca	Si	Hf	Hf	Hf	4.149	0.434	
Be	Zn	Zr	Zr	In	In	In	In	2.457	0.599	Sr	Sr	Sr	Sr	Cd	Si	Si	Si	3.074	0.899	Mg	Cd	Cd	Cd	Ge	Ti	Ti	Zr	3.498	0.683	Be	Be	Mg	Mg	Zr	Zr	Zr	Hf	4.149	0.817	
Ba	Cd	Cd	Cd	Si	Si	Si	Hf	2.458	0.936	Sr	Zn	Zn	Zn	Si	Si	Si	Zr	3.075	1.028	Zn	Zn	Zn	Ge	Zr	Al	Al	Al	3.498	1.013	Be	Be	Be	Be	Si	Si	Zr	Hf	4.149	0.899	
Ba	Ba	Ti	Ti	Ga	In	In	In	2.459	0.737	Be	Be	Be	Ba	Ba	Ba	Sn	Ti	3.075	0.818	Be	Zn	Cd	Cd	Hf	Hf	Hf	Hf	3.498	0.503	Be	Mg	Sr	Sr	Si	Si	Si	Si	4.151	1.073	
Ca	Ca	Ba	Zn	Sn	Sn	Sn	Sn	2.460	0.601	Ca	Ba	Zr	Zr	Y	Y	Y	Y	3.076	0.866	Ca	Ca	Ba	Ba	Ge	Ge	Ge	Sn	3.499	0.631	Ca	Ca	Ca	Ge	Ti	Ti	Zr	Zr	4.152	0.712	
Mg	Mg	Cd	Cd	Si	Si	Si	Sn	2.460	0.917	Ca	Ba	Ba	Ba	Ge	Ge	Sn	Sn	3.076	1.021	Mg	Mg	Ge	Ge	Al	Sc	Sc	Sc	3.499	0.515	Be	Mg	Mg	Zn	Ti	Ti	Ti	Ti	4.153	0.598	
Ba	Zn	Cd	Cd	Zr	Zr	Zr	Zr	2.461	0.892	Cd	Cd	Cd	Cd	Si	Ti	Ti	Zr	3.077	0.893	Ca	Ca	Ba	Ba	Si	Hf	Hf	Hf	3.499	1.226	Be	Ca	Ca	Zn	Si	Si	Si	Si	4.153	0.841	
Zn	Zn	Sn	Sn	Sc	Sc	Sc	Y	2.461	0.872	Zn	Zn	Cd	Cd	Si	Si	Sn	Sn	3.077	0.898	Ca	Ca	Sr	Sr	Zr	Zr	Hf	Hf	3.499	1.641	Mg	Ca	Ca	Ca	Ge	Ge	Zr	Zr	4.154	0.902	
Ba	Zn	Zn	Zn	Ge	Ge	Hf	Hf	2.461	0.066	Sr	Sr	Ti	Ti	Ga	Sc	Sc	Sc	3.077	0.919	Be	Sr	Sr	Sr	Si	Si	Ge	Ge	3.499	0.469	Be	Be	Ge	Ge	Al	Al	Al	Sc	4.156	1.069	
Ba	Cd	Cd	Cd	Zr	Zr	Zr	Hf	2.462	-0.039	Be	Be	Be	Sn	Ge	Ge	Ge	Sn	3.077	0.962	Ca	Ca	Ti	Ti	Al	Al	Sc	Sc	3.499	0.557	Be	Be	Ti	Ti	Al	Ga	Ga	Ga	4.156	0.743	
Ba	Ba	Hf	Hf	Ga	Ga	Ga	Y	2.462	-0.082	Ca	Ca	Zn	Zn	Si	Si	Ge	Ge	3.078	0.849	Be	Be	Be	Ba	Si	Si	Si	Hf	3.499	0.254	Ca	Ca	Ca	Ca	Si	Ge	Ge	Zr	4.157	0.629	
Mg	Mg	Cd	Cd	Sn	Sn	Sn	Ti	2.463	0.433	Be	Be	Be	Zn	Ge	Hf	Hf	Hf	3.078	0.882	Be	Mg	Cd	Cd	Zr	Zr	Zr	Zr	3.499	0.758	Ca	Ca	Ca	Ca	Si	Ge	Ti	Ti	4.157	0.620	
Mg	Mg	Ge	Ge	Al	Al	In	In	2.463	0.092	Zn	Zn	Zn	Cd	Ti	Ti	Hf	Hf	3.078	1.090	Ca	Ca	Sr	Zn	Zr	Zr	Zr	Zr	3.500	1.131	Al	Ga	Ga	Sc	Sc	Sc	Sc	Y	4.158	1.108	
Ba	Ba	Zr	Zr	Ga	Ga	Ga	Ga	2.464	-0.074	Be	Be	Ba	Ba	Ge	Ge	Ge	Hf	3.078	0.781	Be	Sr	Cd	Cd	Si	Si	Si	Si	3.500	0.321	Mg	Ca	Ca	Ca	Ge	Hf	Hf	Hf	4.158	1.378	
Ba	Ba	Ba	Zn	Ge	Ge	Sn	Sn	2.464	0.531	Ba	Ba	Ti	Ti	Sc	Sc	Sc	Y	3.079	0.808	Mg	Ba	Ba	Ba	Ti	Ti	Hf	Hf	3.500	0.445	Mg	Mg	Mg	Ca	Ti	Ti	Ti	Zr	4.160	0.337	
Ba	Ba	Ba	Cd	Sn	Sn	Sn	Ti	2.465	0.098	Be	Be	Be	Zn	Sn	Zr	Zr	Zr	3.079	0.996	Ca	Ca	Sr	Zn	Ti	Ti	Ti	Ti	3.501	0.404	Be	Ca	Ca	Ca	Ge	Hf	Hf	Hf	4.161	0.231	
Mg	Zn	Hf	Hf	In	In	In	In	2.466	-0.084	Ca	Ca	Zr	Zr	Al	Y	Y	Y	3.079	0.837	Mg	Mg	Ba	Ba	Ti	Ti	Zr	Zr	3.502	0.762	Mg	Mg	Ca	Ca	Ti	Ti	Ti	Zr	4.162	0.971	
Mg	Mg	Mg	Cd	Si	Sn	Sn	Sn	2.466	0.927	Ba	Ba	Si	Zr	Sc	Sc	Sc	Sc	3.079	0.896	Be	Be	Be	Ca	Sn	Sn	Ti	Ti	3.502	1.092	Mg	Mg	Sr	Ba	Si	Si	Si	Si	4.162	1.500	
Sr	Cd	Cd	Cd	Ge	Ge	Ti	Ti	2.467	0.203	Cd	Cd	Si	Si	In	Sc	Sc	Sc	3.079	0.926	Sr	Zn	Si	Si	Sc	Sc	Sc	Sc	3.502	0.520	Mg	Ca	Ca	Si	Ge	Ge	Ge	Ge	4.163	1.762	
Cd	Cd	Cd	Cd	Sn	Sn	Ti	Zr	2.467	-0.065	Ca	Ca	Ge	Hf	Y	Y	Y	Y	3.080	0.672	Mg	Ba	Ba	Ba	Ti	Ti	Zr	Zr	3.502	0.629	Be	Be	Be	Be	Si	Si	Ge	Hf	4.165	0.609	
Cd	Cd	Cd	Cd	Ge	Sn	Hf	Hf	2.467	0.989	Ba	Ba	Zn	Zn	Ti	Ti	Hf	Hf	3.080	0.859	Mg	Mg	Ba	Ba	Ge	Ge	Ge	Hf	3.502	0.435	Be	Be	Mg	Mg	Ti	Zr	Zr	Zr	4.166	0.437	
Ca	Zn	Zn	Zn	Si	Si	Sn	Sn	2.468	0.220	Zn	Zn	Zn	Zn	Si	Sn	Zr	Zr	3.080	0.914	Ca	Ca	Si	Ti	Al	Al	Al	Al	3.502	0.771	Mg	Ca	Zn	Zn	Si	Si	Si	Si	4.167	1.389	
Be	Ba	Ge	Ge	Al	Al	Al	Al	2.468	-0.061	Sr	Sr	Zr	Hf	Sc	Sc	Sc	Sc	3.081	0.641	Ca	Ca	Ti	Zr	Sc	Sc	Sc	Sc	3.502	1.094	Be	Be	Be	Be	Si	Si	Ge	Sn	4.168	1.848	
Sr	Sr	Ti	Ti	Ga	Ga	In	In	2.468	0.469	Be	Zn	Sn	Sn	Al	Al	Al	Al	3.081	0.851	Ca	Sr	Sr	Sr	Zr	Zr	Hf	Hf	3.502	0.557	Ca	Ca	Ca	Ca	Si	Ti	Ti	Hf	4.168	0.468	
Ba	Cd	Cd	Cd	Ti	Hf	Hf	Hf	2.469	0.230	Mg	Mg	Mg	Sr	Sn	Sn	Sn	Zr	3.081	1.128	Mg	Ca	Ca	Zn	Ge	Ge	Ge	Ge	3.502	0.662	Be	Be	Mg	Mg	Ti	Ti	Hf	Hf	4.168	1.000	
Zn	Cd	Si	Si	Ga	Ga	Ga	Ga	2.470	0.114	Ba	Ba	Ba	Ba	Zn	Ge	Ge	Ge	3.081	0.938	Be	Sr	Sr	Sr	Sn	Ti	Ti	Ti	3.503	0.386	Be	Be	Be	Mg	Si	Si	Hf	Hf	4.168	0.756	
Ba	Ba	Ge	Zr	Al	Al	Al	Al	2.470	0.557	Sr	Sr	Ba	Ba	Zn	Ge	Ge	Ge	3.082	0.934	Ca	Cd	Zr	Zr	Sc	Sc	Sc	Sc	3.503	0.877	Mg	Mg	Ca	Ca	Si	Zr	Zr	Zr	4.169	0.819	
Zn	Zn	Sn	Sn	Al	Ga	Ga	Ga	2.470	0.249	Zn	Zn	Ti	Zr	Ga	Ga	Ga	Ga	3.082	1.034	Mg	Ba	Ba	Ba	Ge	Zr	Zr	Zr	3.504	1.219	Mg	Mg	Mg	Zn	Si	Ti	Ti	Ti	4.170	1.034	
Cd	Cd	Si	Ti	Ga	Ga	Ga	Ga	2.470	0.120	Zn	Zn	Ti	Ti	Ga	Ga	Y	Y	3.082	1.008	Mg	Ba	Ba	Ba	Si	Si	Ge	Ge	3.504	0.396	Mg	Mg	Si	Hf	Al	Al	Al	Al	4.171	1.245	
Sr	Sr	Zr	Zr	In	Sn	Sn	Sn	2.470	0.938	Mg	Ba	Hf	Hf	Sc	Sc	Sc	Sc	3.083	1.043	Mg	Mg	Zn	Zn	Sn	Hf	Hf	Hf	3.504	0.472	Ca	Ca	Ca	Ca	Si	Si	Ti	Hf	4.171	0.641	
Be	Cd	Cd	Cd	Si	Si	Sn	Sn	2.471	0.338	Ca	Zn	Zn	Zn	Ti	Ti	Ti	Hf	3.083	0.956	Be	Be	Be	Zn	Si	Si	Si	Hf	3.504	0.515	Be	Ca	Be	Mg	Ge	Ge	Ge	Ge	4.172	0.508	
Ca	Ca	Ti	Ti	In	In	Y	Y	2.471	0.138	Mg	Sr	Zr	Zr	Y	Y	Y	Y	3.083	0.837	Be	Mg	Ba	Ba	Bz	Zr	Zr	Zr	3.505	0.861	Be	Ca	Ca	Ca	Ge	Zr	Zr	Zr	4.172	0.911	
Sr	Sr	Cd	Cd	Ti	Ti	Ti	Ti	2.471	0.997	Zn	Zn	Zr	Zr	Al	Ga	Ga	Ga	3.083	1.014	Mg	Zn	Zn	Cd	Ti	Ti	Ti	Ti	3.505	1.161	Mg	Mg	Ge	Ti	Al	Al	Al	Al	4.174	0.977	
Ba	Ba	Si	Ge	Al	Al	Al	Al	2.471	0.352	Cd	Cd	Ti	Zr	Y	Y	Y	Y	3.083	0.943	Ca	Sr	Sr	Ba	Ti	Ti	Ti	Ti	3.506	0.573	Mg	Ca	Ca	Ca	Ge	Zr	Zr	Zr	4.174	1.144	
Ba	Zn	Ge	Ge	Al	Al	Al	Al	2.471	0.142	Ba	Ba	Si	Hf	Y	Y	Y	Y	3.085	0.804	Sr	Sr	Sr	Sr	Si	Zr	Zr	Hf	3.506	0.637	Mg	Ca	Mg	Mg	Zn	Si	Si	Ge	Ge	4.176	0.799
Zn	Zn	Sn	Sn	Al	Sc	Sc	Sc	2.472	0.569	Sr	Sr	Zr	Zr	Sc	Y	Y	Y	3.085	1.008	Sr	Sr	Sr	Ba	Ge	Ge	Sn	Hf	3.506	0.542	Mg	Mg	Si	Si	Sc	Sc	Sc	Y	4.176	0.671	
Ca	Cd	Cd	Cd	Ge	Ge	Ge	Ge	2.472	0.605	Ca	Ca	Zr	Cd	Hf	Hf	Hf	Hf	3.085	1.049	Mg	Ba	Ba	Ba	Ge	Ge	Hf	Hf	3.506	0.867	Be	Be	Ca	Ca	Si	Ti	Ti	Zr	4.176	0.933	
Ba	Ba	Cd	Cd	Si	Zr	Zr	Zr	2.472	0.548	Ca	Ca	Zn	Cd	Zr	Zr	Zr	Zr	3.086	1.250	Mg	Mg	Ba	Ba	Ti	Zr	Zr	Zr	3.506	1.160	Ca	Ca	Ca	Ca	Si	Ti	Ti	Zr	4.180	0.940	
Ba	Ba	Zn	Zn	Ge	Ge	Ge	Hf	2.472	0.925	Ba	Ba	Ti	Zr	Sc	Sc	Sc	Sc	3.087	1.266	Mg	Ca	Ca	Ba	Bz	Zr	Hf	Hf	3.506	0.606	Mg	Ca	Ca	Ca	Si	Si	Sn	Sn	4.183	1.179	
Zn	Zn	Ge	Ge	Ga	Ga	Sc	Sc	2.472	0.705	Sr	Sr	Ti	Cd	Al	Y	Y	Y	3.087	0.969	Ca	Ca	Ca	Sr	Sn	Zr	Zr	Zr	3.506	0.668	Be	Ca	Sn	Zr	Al	Al	Al	Al	4.184	0.829	
Mg	Cd	Sn	Sn	Al	Al	Al	Al	2.473	0.565	Cd	Cd	Cd	Cd	Si	Si	Ti	Zr	3.087	1.086	Mg	Mg	Ti	Ti	Al	Al	Y	Y	3.506	0.362	Ca	Ca	Ca	Ca	Si	Si	Ti	Zr	4.184	0.701	
Ba	Ba	Si	Ti	Ga	Ga	Ga	Ga	2.473	0.981	Mg	Mg	Ti	Ti	In	In	In	Sc	3.088	1.235	Ca	Ca	Ti	Ti	Sc	Y	Y	Y	3.506	0.666	Be	Zn	Si	Si	Sc	Sc	Sc	Sc	4.185	-0.093	
Be	Ba	Cd	Cd	Ge	Ge	Ge	Ge	2.475	0.719	Be	Be	Be	Sr	Si	Si	Hf	Hf	3.088	0.956	Zn	Zn	Zn	Zn	Si	Zr	Hf	Hf	3.507	0.935	Mg	Mg	Ca	Ca	Si	Ge	Ge	Ge	4.185	0.620	
Be	Be	Sn	Sn	Al	Y	Y	Y	2.475	0.568	Be	Be	Be	Sn	Ti	Ti	Ti	Zr	3.088	1.053	Ca	Ca	Ba	Ba	Si	Zr	Zr	Zr	3.507	0.423	Mg	Ca	Ca	Ca	Ti	T					

Ba	Zn	Zn	Cd	Zr	Zr	Zr	2.506	0.822	Sr	Sr	Sr	Ba	Sn	Sn	Hf	Hf	3.112	1.095	Sr	Sr	Sr	Sr	Si	Sn	Sn	Ti	3.525	0.541	Be	Be	Be	Mg	Ge	Ge	Ge	Ti	4.256	0.971
Sr	Sr	Sr	Zn	Ge	Ge	Sn	2.506	1.351	Ca	Ca	Ca	Cd	Ti	Ti	Ti	Hf	3.113	1.144	Ca	Sr	Sr	Sr	Zr	Hf	Hf	Hf	3.526	0.552	Mg	Mg	Si	Zr	Al	Al	Al	Al	4.258	0.521
Be	Be	Sr	Sr	Si	Sn	Sn	2.507	0.890	Ba	Ba	Si	Si	Al	Y	Y	Y	3.113	0.729	Al	Al	Ga	Ga	In	Y	Y	Y	3.526	0.583	Mg	Mg	Mg	Sr	Si	Si	Si	Ti	4.260	0.354
Sr	Ba	Cd	Cd	Ti	Ti	Ti	2.507	0.810	Sr	Cd	Si	Si	Al	Al	Al	Al	3.113	0.880	Mg	Zn	Ge	Ge	Sc	Sc	Sc	Sc	3.526	0.855	Mg	Ca	Ca	Ca	Zr	Hf	Hf	Hf	4.260	0.836
Ba	Ba	Zr	Zr	Ga	Ga	Ga	2.508	1.388	Zn	Cd	Cd	Cd	Ti	Ti	Ti	Zr	3.113	1.118	Be	Mg	Ba	Ba	Hf	Hf	Hf	Hf	3.526	1.097	Be	Ca	Ca	Ca	Ti	Ti	Zr	Zr	4.262	0.791
Ba	Zn	Zn	Cd	Ti	Ti	Ti	2.508	0.888	Ca	Zn	Zn	Zn	Si	Ge	Ge	Ge	3.114	0.687	Mg	Mg	Ca	Ca	Ge	Ge	Sn	Sn	3.526	0.573	Mg	Mg	Ba	Zn	Si	Si	Si	Si	4.263	0.910
Sr	Cd	Cd	Cd	Sn	Hf	Hf	2.508	0.807	Zn	Zn	Zn	Cd	Ti	Ti	Zr	Zr	3.114	0.839	Al	Al	Ga	Ga	In	In	Sc	Sc	3.526	0.582	Be	Ca	Ca	Ca	Ti	Zr	Zr	Zr	4.266	0.690
Mg	Sr	Cd	Cd	Ge	Ge	Ge	2.509	1.135	Mg	Mg	Cd	Cd	Sn	Hf	Hf	Hf	3.114	1.111	Ga	In	In	Sc	Y	Y	Y	Y	3.526	0.588	Mg	Mg	Si	Si	Al	Al	Al	Ga	4.266	0.522
Ca	Ca	Ti	Ti	Al	In	In	2.510	1.254	Sr	Sr	Si	Si	Al	Al	Sc	Sc	3.114	1.007	Sr	Sr	Sr	Sr	Si	Sn	Ti	Ti	3.527	0.828	Mg	Ca	Ca	Si	Si	Ge	Ge	Ge	4.266	0.860
Ba	Zn	Zn	Sn	Ge	Ge	Zr	2.511	1.234	Sr	Sr	Sr	Ba	Ge	Sn	Sn	Sn	3.114	1.259	Mg	Mg	Mg	Cd	Si	Si	Zr	Zr	3.527	1.032	Mg	Zn	Zn	Zn	Si	Si	Si	Ti	4.267	0.797
Be	Be	Sn	Sn	Ga	Ga	Ga	2.511	1.357	Cd	Cd	Si	Hf	Y	Y	Y	Y	3.114	1.211	Mg	Mg	Mg	Zr	Y	Y	Y	Y	3.527	0.549	Mg	Mg	Mg	Ca	Si	Ge	Ge	Ge	4.267	0.910
Mg	Ba	Ba	Cd	Ge	Ge	Ge	2.513	1.270	Cd	Cd	Ti	Ti	In	Sc	Sc	Sc	3.115	0.748	Al	Al	Ga	Ga	Ga	Ga	Sc	Y	3.528	0.544	Be	Ca	Ca	Ca	Zr	Zr	Hf	Hf	4.269	0.721
Be	Be	Be	Sr	Sn	Sn	Sn	2.513	1.225	Ba	Zn	Hf	Hf	Y	Y	Y	Y	3.115	1.038	Ca	Ca	Sr	Sr	Ti	Hf	Hf	Hf	3.528	0.111	Be	Ca	Ca	Ca	Ti	Hf	Hf	Hf	4.269	0.552
Sr	Sr	Si	Ti	Ga	Ga	Ga	2.513	1.392	Mg	Mg	Ge	Zr	Ga	Ga	Ga	Ga	3.117	1.178	Ca	Ca	Ca	Ba	Ti	Zr	Zr	Zr	3.528	-0.027	Mg	Mg	Mg	Mg	Si	Sn	Sn	Ti	4.272	0.553
Sr	Cd	Cd	Cd	Sn	Zr	Zr	2.513	1.269	Be	Ca	Hf	Hf	Ga	Ga	Ga	Ga	3.117	0.700	Be	Be	Be	Ca	Ti	Ti	Ti	Hf	3.528	-0.251	Mg	Mg	Mg	Mg	Ge	Ge	Sn	Zr	4.274	0.869
Be	Be	Be	Sr	Si	Sn	Sn	2.514	1.222	Ca	Ca	Zr	Zr	Al	Al	Al	Ga	3.117	0.996	Sr	Sr	Sr	Sr	Ge	Sn	Sn	Ti	3.528	0.465	Mg	Mg	Ca	Ca	Si	Si	Ge	Ge	4.275	1.070
Sr	Sr	Hf	Hf	Ga	Ga	Ga	2.515	1.252	Be	Sr	Zn	Zn	Ge	Ge	Ge	Ge	3.117	1.170	Be	Be	Be	Ba	Si	Si	Si	Zr	3.528	0.269	Be	Be	Ti	Ti	Al	Al	Al	Y	4.276	0.260
Be	Be	Be	Cd	Sn	Sn	Hf	2.515	1.105	Be	Ca	Ge	Ge	Sc	Sc	Sc	Sc	3.117	0.855	Sr	Sr	Sr	Sr	Si	Si	Sn	Hf	3.529	-0.153	Mg	Mg	Mg	Zn	Si	Si	Si	Zr	4.278	0.121
Zn	Zn	Cd	Cd	Sn	Sn	Hf	2.516	1.011	Sr	Sr	Sr	Ba	Si	Sn	Sn	Sn	3.118	0.895	Ba	Ba	Ba	Ba	Si	Ge	Ti	Ti	3.529	-0.155	Mg	Mg	Mg	Mg	Ge	Sn	Sn	Ti	4.279	0.895
Mg	Zn	Zr	Zr	In	In	In	2.516	1.289	Ca	Zn	Zn	Zn	Hf	Hf	Hf	Hf	3.119	1.024	Be	Be	Hf	Hf	In	Sc	Sc	Sc	3.529	-0.145	Mg	Mg	Mg	Zn	Si	Si	Ti	Ti	4.279	1.255
Be	Be	Sn	Zr	In	In	In	2.516	1.115	Be	Be	Be	Sr	Si	Zr	Zr	Zr	3.119	0.817	Ca	Ca	Ca	Ba	Zr	Hf	Hf	Hf	3.530	-0.387	Mg	Mg	Mg	Ca	Si	Si	Zr	Zr	4.279	1.451
Ca	Cd	Cd	Cd	Ge	Ge	Zr	2.518	1.009	Be	Ca	Ge	Ge	Al	Al	Al	Al	3.119	0.859	Mg	Mg	Mg	Sr	Sn	Hf	Hf	Hf	3.530	0.266	Al	Al	Al	Al	Ga	Sc	Y	Y	4.279	0.537
Cd	Cd	Ge	Sn	Sc	Sc	Sc	2.518	1.261	Sr	Sr	Sr	Zn	Ti	Ti	Hf	Hf	3.119	1.014	Be	Be	Mg	Mg	Sn	Ge	Ge	Ge	3.530	0.231	Mg	Mg	Ti	Ti	Al	Al	Sc	Al	4.281	0.325
Be	Zn	Zn	Zn	Ge	Sn	Sn	2.519	1.240	Zn	Zn	Ge	Ge	Al	Sc	Sc	Sc	3.120	0.902	Zn	Zn	Zn	Zn	Ti	Zr	Zr	Hf	3.530	-0.257	Be	Be	Be	Be	Si	Ge	Ge	Ti	4.281	1.322
Ba	Ba	Sn	Zr	Sc	Sc	Sc	2.520	1.224	Ca	Ca	Ca	Cd	Ti	Ti	Hf	Hf	3.120	0.906	Ca	Sr	Sr	Sr	Ti	Hf	Hf	Hf	3.530	0.628	Be	Ca	Ca	Ca	Zr	Zr	Zr	Hf	4.281	1.622
Ba	Cd	Cd	Cd	Si	Hf	Hf	2.520	0.339	Be	Mg	Sn	Sn	Sc	Sc	Sc	Sc	3.120	0.927	Zn	Zn	Zn	Zn	Si	Zr	Zr	Hf	3.530	0.558	Be	Be	Mg	Mg	Ti	Ti	Ti	Hf	4.283	1.796
Sr	Sr	Cd	Cd	Ge	Zr	Zr	2.520	0.241	Al	Al	Al	Ga	Ga	In	Y	Y	3.120	0.842	Ca	Ca	Ca	Ba	Ti	Hf	Hf	Hf	3.531	0.346	Be	Be	Ti	Ti	Al	Al	Al	In	4.283	0.921
Ba	Ba	Ba	Cd	Si	Si	Si	2.520	0.202	Be	Ba	Cd	Cd	Ti	Ti	Ti	Ti	3.120	0.741	Be	Be	Mg	Cd	Ge	Ge	Ge	Ge	3.531	0.006	Be	Be	Zr	Zr	Ti	Al	Al	Sc	4.283	0.643
Ca	Ca	Hf	Hf	In	In	In	2.521	0.691	Zn	Zn	Cd	Cd	Ge	Zr	Zr	Zr	3.120	0.780	Ca	Ca	Si	Si	Al	Al	Sc	Sc	3.531	0.110	Be	Be	Mg	Mg	Sn	Ti	Ti	Ti	4.285	0.807
Ca	Ca	Hf	Hf	Al	In	In	2.521	0.362	Sr	Sr	Ba	Ba	Ge	Sn	Sn	Sn	3.120	0.949	Zn	Zn	Ti	Ti	Ga	Sc	Sc	Sc	3.531	0.050	Ca	Ca	Ca	Ca	Si	Ge	Ti	Ti	4.285	0.872
Ba	Ba	Zn	Cd	Ti	Ti	Ti	2.521	0.203	Zn	Zn	Cd	Cd	Si	Si	Ge	Ge	3.120	0.658	Ca	Sr	Zn	Zn	Hf	Hf	Hf	Hf	3.531	0.428	Be	Ca	Ca	Ca	Zr	Hf	Hf	Hf	4.285	1.019
Ba	Ba	Hf	Hf	Ga	Ga	Ga	2.522	0.804	Ca	Ba	Zr	Zr	Al	Al	Al	Al	3.121	0.692	Be	Ca	Cd	Cd	Hf	Hf	Hf	Hf	3.531	0.461	Mg	Mg	Zr	Hf	Al	Al	Al	Al	4.285	0.596
Sr	Sr	Cd	Cd	Ge	Hf	Hf	2.522	0.369	Mg	Mg	Mg	Sr	Ge	Ge	Sn	Sn	3.121	0.903	Mg	Mg	Ba	Ba	Si	Si	Ge	Ge	3.531	0.140	Mg	Mg	Mg	Si	Sn	Hf	Hf	Hf	4.286	0.915
Sr	Sr	Ti	Ti	Ga	Ga	Ga	2.522	0.190	Be	Mg	Ca	Ba	Sn	Sn	Sn	Sn	3.122	0.723	Be	Ca	Si	Si	Y	Y	Y	Y	3.532	0.068	Mg	Mg	Si	Si	Al	Al	Al	Sc	4.286	0.417
Mg	Mg	Zn	Zn	Si	Sn	Sn	2.522	1.167	Ca	Ba	Si	Si	Al	Al	Al	Al	3.122	0.774	Be	Be	Mg	Zn	Zr	Zr	Zr	Zr	3.533	0.313	Mg	Mg	Ca	Ca	Sn	Ti	Ti	Ti	4.286	0.851
Ba	Cd	Cd	Cd	Si	Zr	Zr	2.522	0.445	Ba	Ba	Ba	Ba	Sn	Sn	Zr	Hf	3.123	0.844	Ca	Ca	Ba	Ba	Si	Si	Zr	Zr	3.534	0.448	Mg	Ca	Ca	Zn	Si	Si	Si	Si	4.286	0.961
Be	Zn	Ge	Ge	Ga	Ga	Ga	2.522	0.191	Zn	Zn	Zn	Cd	Ge	Zr	Zr	Zr	3.123	0.552	Mg	Mg	Sn	Ti	Y	Y	Y	Y	3.534	0.461	Mg	Ca	Ca	Ba	Si	Si	Si	Si	4.287	0.766
Sr	Sr	Cd	Cd	Si	Si	Si	2.523	1.222	Ca	Zn	Zn	Zn	Ti	Ti	Zr	Zr	3.124	0.725	Ba	Ba	Ba	Ba	Si	Sn	Sn	Ti	3.534	0.655	Be	Be	Si	Si	Sc	Sc	Sc	Y	4.287	0.587
Zn	Cd	Cd	Cd	Sn	Sn	Zr	2.524	0.456	Sr	Sr	Ba	Ba	Sn	Sn	Sn	Sn	3.125	0.834	Ba	Ba	Ba	Ba	Ge	Sn	Sn	Ti	3.534	0.549	Be	Zn	Zn	Zn	Si	Si	Ge	Ge	4.288	0.940
Ca	Ca	Hf	Hf	In	In	In	2.524	0.191	Zn	Cd	Cd	Cd	Ge	Ge	Ti	Ti	3.125	0.520	Be	Be	Zn	Zn	Ge	Ti	Ti	Ti	3.534	0.158	Mg	Zn	Si	Si	Al	Al	Al	Al	4.289	0.857
Cd	Cd	Hf	Hf	In	In	Sc	2.524	0.738	Be	Be	Sr	Zn	Hf	Hf	Hf	Hf	3.125	0.716	Ca	Ca	Sr	Sr	Ge	Zr	Zr	Zr	3.535	0.163	Mg	Mg	Mg	Ca	Ge	Ge	Ge	Ti	4.292	0.962
Ba	Cd	Zr	Zr	Ga	Ga	Ga	2.525	0.503	Be	Be	Ca	Ca	Sn	Sn	Sn	Hf	3.125	1.002	Mg	Cd	Ti	Ti	Y	Y	Y	Y	3.535	-0.027	Be	Be	Zr	Zr	Al	Al	Al	Ga	4.295	0.797
Cd	Cd	Cd	Cd	Si	Sn	Zr	2.525	0.389	Al	Al	Ga	Ga	In	In	In	Sc	3.125	0.816	Be	Be	Be	Be	Ge	Sn	Zr	Zr	3.535	0.401	Be	Be	Be	Mg	Hf	Ti	Ti	Ti	4.296	0.618
Sr	Cd	Ti	Ti	Ga	Ga	Ga	2.526	0.840	Be	Sr	Zr	Zr	Sc	Sc	Sc	Sc	3.126	0.813	Mg	Ca	Ti	Ti	Y	Y	Y	Y	3.535	0.250	Be	Mg	Hf	Hf	Al	Al	Al	Al	4.297	0.178
Sr	Sr	Si	Sn	Ge	Sc	Sc	2.526	0.522	Mg	Mg	Mg	Cd	Ge	Ge	Ge	Sn	3.126	0.955	Be	Zn	Cd	Cd	Ti	Ti	Ti	Ti	3.535	0.030	Mg	Mg	Ti	Ti	Al	Al	Ga	Ga	4.298	0.760
Sr	Sr	Zn	Zn	Ge	Ge	Ge	2.527	0.393	Be	Be	Zr	Zr	Al	Al	In	In	3.126	0.894	Mg	Mg	Mg	Ba	Ti	Ti	Zr	Zr	3.535	0.750	Al	Al	Al	Al	Al	Ga	In			

Sr	Sr	Si	Ge	Al	Al	Al	2.570	-0.058	Ca	Ba	Ba	Ba	Ge	Ge	Sn	Sn	3.145	1.251	Ga	Ga	In	Sc	Sc	Sc	Y	Y	3.556	0.203	Be	Be	Si	Si	Al	Al	Al	In	4.402	0.884		
Ba	Ba	Ba	Cd	Ti	Ti	Hf	Hf	2.571	-0.157	Be	Be	Cd	Cd	Si	Zr	Zr	3.146	1.093	Zn	Zn	Si	Ge	Sc	Sc	Sc		3.556	0.711	Mg	Mg	Mg	Mg	Si	Si	Sn	Hf	4.403	1.009		
Ba	Cd	Ge	Ge	Sc	Sc	Sc	Sc	2.571	0.228	Be	Ba	Si	Si	Y	Y	Y	3.146	1.298	Ca	Ca	Ca	Ba	Ti	Ti	Ti	Hf	3.556	0.711	Be	Zn	Zn	Si	Si	Si	Ti	4.404	0.665			
Sr	Sr	Cd	Cd	Si	Hf	Hf	Hf	2.571	0.005	Sr	Sr	Sr	Zn	Ti	Ti	Zr	3.146	1.216	Mg	Mg	Ba	Ba	Ge	Hf	Hf	Hf	3.557	0.268	Mg	Ca	Ca	Ca	Si	Ti	Ti	Ti	4.406	0.475		
Ba	Cd	Ge	Ge	Y	Y	Y	Y	2.571	-0.013	Be	Be	Cd	Cd	Si	Si	Si	3.146	1.289	Be	Be	Cd	Cd	Si	Si	Si	Hf	3.557	0.353	Be	Mg	Mg	Mg	Sn	Hf	Hf	Hf	4.422	0.984		
Sr	Sr	Zn	Zn	Si	Si	Si	Sn	2.571	0.294	Sr	Sr	Sr	Zn	Ge	Hf	Hf	3.146	1.447	Mg	Sr	Ba	Ba	Ti	Ti	Ti	Ti	3.557	0.487	Mg	Mg	Ca	Ca	Ge	Ge	Ti	Ti	4.427	0.872		
Ca	Ca	Zr	Zr	Ge	Al	In	In	2.572	-0.124	Be	Be	Ca	Ca	Sn	Sn	Sn	3.146	0.947	Mg	Mg	Mg	Cd	Ti	Ti	Ti	Hf	3.557	0.502	Mg	Ca	Ca	Ca	Ge	Ge	Ge	Ti	4.428	0.964		
Be	Cd	Sn	Sn	Sc	Sc	Sc	Sc	2.572	-0.053	Ca	Ca	Cd	Zn	Ti	Ti	Hf	Hf	3.146	1.088	Mg	Mg	Mg	Ba	Zr	Zr	Hf	Hf	3.558	0.693	Be	Ca	Ca	Ca	Si	Si	Hf	Hf	4.435	0.836	
Be	Sr	Ba	Ba	Sn	Sn	Sn	Sn	2.572	0.305	Mg	Cd	Ge	Ge	Al	Al	Al	3.146	1.429	Mg	Mg	Mg	Ba	Ge	Ge	Hf	Hf	3.559	0.804	Mg	Mg	Mg	Mg	Si	Si	Sn	Zr	4.439	0.647		
Sr	Sr	Zn	Zn	Si	Ge	Ge	Ge	2.572	-0.149	Sr	Sr	Sr	Zn	Ge	Ge	Ge	Hf	3.146	0.901	Ba	Ba	Ba	Ba	Si	Ti	Ti	Zr	3.559	0.578	Be	Be	Si	Si	Al	Al	Al	Y	4.447	1.006	
Ca	Ca	Zr	Zr	Al	In	In	In	2.572	-0.061	Sr	Cd	Hf	Hf	Al	Al	Al	3.146	1.049	Be	Be	Be	Zn	Sn	Ti	Ti	Ti	Zr	3.559	0.488	Be	Ca	Ca	Si	Al	Si	Zr	Zr	4.448	0.879	
Al	Ga	Ga	In	In	In	In	Sc	2.573	0.265	Zn	Zn	Ti	Ti	Al	Ga	Ga	Ga	3.147	1.424	Mg	Mg	Ti	Ti	Al	Y	Y	Y	3.559	0.530	Mg	Mg	Ca	Sr	Si	Si	Si	Si	4.457	0.966	
Be	Be	Ba	Ba	Ge	Ge	Sn	Sn	2.574	0.096	Be	Be	Sn	Hf	Y	Y	Y	Y	3.147	1.224	Ga	In	In	Sc	Sc	Y	Y	Y	3.559	0.334	Be	Be	Mg	Mg	Si	Si	Hf	Hf	4.459	0.866	
Be	Be	Sn	Sn	Ga	Ga	Ga	Y	2.574	0.024	Be	Be	Si	Si	Ga	Ga	Y	Y	3.147	1.138	Ca	Ca	Sr	Sr	Ti	Ti	Ti	Zr	3.560	0.429	Be	Be	Mg	Cd	Si	Si	Si	Si	4.463	0.678	
Ca	Be	Ba	Ba	Si	Si	Sn	Sn	2.574	0.275	Zn	Zn	Ge	Ge	Al	Al	Al	Sc	3.147	1.236	Zn	Cd	Cd	Cd	Si	Si	Si	Ti	3.560	0.409	Be	Be	Si	Ti	Sc	Sc	Sc	Sc	4.465	0.352	
Ca	Ca	Ca	Cd	Sn	Sn	Sn	Hf	2.574	0.164	Ba	Ba	Si	Si	Al	Sc	Sc	Sc	3.147	1.156	Be	Be	Ge	Ge	Ga	Sc	Sc	Sc	3.560	0.302	Be	Zn	Si	Si	Al	Al	Al	Al	4.468	0.875	
Sr	Ba	Zn	Zn	Ge	Ge	Ge	Ge	2.575	0.201	Ca	Sr	Zr	Zr	Y	Y	Y	Y	3.147	1.315	Mg	Sr	Sr	Sr	Si	Si	Si	Sn	3.560	0.637	Be	Mg	Mg	Mg	Sn	Zr	Zr	Zr	4.470	1.268	
Sr	Ba	Ge	Ge	Sc	Sc	Sc	Sc	2.576	0.325	Ca	Ca	Zn	Zn	Sr	Zr	Zr	Zr	3.147	1.381	Mg	Mg	Zn	Zn	Ge	Hf	Hf	Hf	3.560	0.645	Mg	Ca	Ca	Ca	Si	Si	Ge	4.471	0.339		
Sr	Cd	Cd	Cd	Zr	Zr	Hf	Hf	2.576	0.015	Ca	Ba	Zr	Zr	Sc	Sc	Sc	Sc	3.148	0.870	Mg	Ca	Zr	Zr	Ge	Sc	Sc	Sc	3.560	0.344	Al	Al	Al	Ga	Sc	Sc	Sc	Y	4.472	0.401	
Sr	Sr	Si	Si	Ga	Ga	Y	Y	2.576	0.172	Zn	Zn	Cd	Cd	Ti	Hf	Hf	Hf	3.148	1.100	Be	Zn	Hf	Hf	Sc	Sc	Sc	Sc	3.561	0.522	Al	Al	Al	In	Sc	Sc	Y	4.474	0.705		
Be	Be	Be	Cd	Cd	Sn	Sn	Zr	2.577	0.333	Be	Ca	Ti	Ti	Ga	Ga	Ga	Ga	3.148	1.365	Mg	Ba	Ba	Ba	Ti	Hf	Hf	Hf	3.561	0.560	Be	Mg	Si	Si	Sc	Sc	Sc	Sc	4.475	1.265	
Ca	Ca	Si	Sn	Al	Al	Al	Al	2.577	-0.014	Ca	Ca	Cd	Cd	Sn	Sn	Sn	Ti	3.148	0.822	Ca	Sr	Sr	Sr	Si	Si	Zr	Zr	3.561	0.253	Be	Mg	Mg	Mg	Ge	Hf	Hf	Hf	4.476	1.662	
Mg	Mg	Cd	Cd	Cd	Sn	Sn	Zr	2.577	0.165	Mg	Zn	Cd	Cd	Ge	Ge	Ge	Ge	3.148	1.059	Mg	Mg	Ba	Ba	Ge	Zr	Zr	Zr	3.562	0.837	Be	Be	Mg	Mg	Ge	Ge	Ge	Ti	4.479	0.642	
Sr	Sr	Zn	Zn	Si	Si	Hf	Hf	2.579	0.301	Ca	Ca	Ti	Ti	Al	Al	Al	Y	3.149	1.360	Sr	Sr	Ba	Ba	Ge	Ti	Ti	Ti	3.562	0.870	Be	Be	Sn	Ti	Al	Al	Al	Al	4.479	0.652	
Sr	Cd	Cd	Cd	Ti	Ti	Zr	Zr	2.580	0.434	Zn	Zn	Cd	Cd	Ti	Zr	Zr	Zr	3.149	1.140	Sr	Ba	Ba	Ba	Si	Si	Si	Sn	3.562	0.334	Be	Mg	Mg	Ba	Si	Si	Si	Si	4.480	1.130	
Ca	Zn	Zn	Zn	Sn	Sn	Hf	Hf	2.580	0.507	Ba	Cd	Hf	Hf	Sc	Sc	Sc	Sc	3.149	1.405	Mg	Ca	Ca	Ca	Ge	Ge	Sn	Sn	3.563	0.682	Mg	Mg	Ca	Ca	Si	Si	Si	Hf	4.481	1.632	
Ca	Ca	Ca	Cd	Sn	Sn	Sn	Zr	2.581	0.281	Sr	Sr	Sr	Zn	Sn	Hf	Hf	Hf	3.149	1.365	Be	Be	Be	Sr	Si	Si	Ge	Ge	3.563	0.692	Mg	Ca	Ca	Ca	Si	Si	Ti	Ti	4.484	1.995	
Ba	Ba	Si	Si	Ge	Al	Y	Y	2.581	0.297	Cd	Cd	Si	Ge	Sc	Sc	Sc	Sc	3.149	0.843	Be	Zn	Zn	Zn	Ge	Ge	Hf	Hf	3.563	0.488	Be	Be	Mg	Mg	Sn	Ti	Ti	Ti	4.495	1.016	
Zn	Zn	Zn	Cd	Sn	Sn	Sn	Zr	2.581	0.476	Be	Be	Ge	Sn	Y	Y	Y	Y	3.149	1.182	Mg	Ba	Ba	Ba	Zr	Hf	Hf	Hf	3.564	0.557	Mg	Mg	Mg	Mg	Ge	Sn	Ti	4.495	0.944		
Mg	Cd	Cd	Cd	Ge	Ge	Ge	Sn	2.581	0.343	Sr	Sr	Ba	Ba	Sn	Sn	Zr	Zr	3.149	1.341	Be	Ba	Ba	Ba	Ge	Ti	Ti	Ti	3.564	0.549	Mg	Mg	Mg	Ca	Si	Si	Si	Hf	4.497	0.569	
Be	Sr	Cd	Cd	Ge	Ge	Sc	Sc	2.581	0.269	Mg	Cd	Cd	Cd	Si	Si	Si	Sn	3.150	0.794	Ca	Ca	Ca	Ba	Si	Si	Hf	Hf	3.564	0.331	Mg	Mg	Mg	Mg	Sn	Zr	Hf	Hf	4.505	0.852	
Cd	Cd	Zr	Zr	In	In	In	Sc	2.582	0.468	Be	Be	Cd	Ti	Ti	Ti	Ga	In	In	3.150	1.140	Ca	Ca	Ca	Ba	Si	Ti	Ti	Zr	3.564	0.876	Be	Be	Be	Be	Si	Zr	Ge	Ti	4.506	1.136
Sr	Zn	Cd	Cd	In	Ti	Ti	Ti	2.583	0.225	Ba	Ba	Si	Zr	Y	Y	Y	Y	3.150	1.334	Zn	Zn	Si	Ti	Y	Y	Y	Y	3.564	0.832	Mg	Mg	Ca	Ca	Si	Si	Si	Zr	4.507	0.534	
Be	Be	Ge	Hf	In	In	In	In	2.583	0.101	Ca	Ca	Zn	Zn	Si	Si	Ti	Ti	3.151	1.009	Al	Ga	Ga	In	Y	Y	Y	Y	3.564	0.375	Mg	Mg	Si	Ti	Al	Al	Al	Al	4.514	0.510	
Ba	Ba	Hf	Hf	Al	Ga	Ga	Ga	2.583	0.096	Sr	Sr	Sr	Zn	Si	Si	Ge	Ge	3.151	1.078	Be	Be	Si	Si	Al	Y	Y	Y	3.565	0.536	Be	Be	Be	Mg	Si	Si	Sn	4.516	0.673		
Be	Be	Ge	Ge	Ga	Ga	Y	Y	2.585	0.237	Sr	Zn	Zn	Zn	Ge	Ti	Ti	Ti	3.151	1.222	Zn	Zn	Si	Si	Ga	Sc	Sc	Sc	3.565	0.590	Be	Be	Mg	Mg	Si	Si	Zr	Zr	4.517	0.816	
Sr	Cd	Cd	Cd	Zr	Zr	Zr	Hf	2.586	0.087	Be	Be	Ba	Si	Zr	Zr	Hf	Hf	3.151	0.966	Ga	Ga	In	Sc	Sc	Y	Y	Y	3.565	0.562	Be	Be	Zr	Hf	Al	Al	Al	Al	4.521	1.024	
Ba	Ba	Si	Sn	Y	Y	Y	Y	2.586	0.086	Mg	Mg	Si	Si	Ga	Ga	Ga	Y	3.151	1.042	Mg	Mg	Mg	Ba	Ti	Ti	Ti	Hf	3.566	0.830	Be	Mg	Mg	Cd	Si	Si	Si	Si	4.521	0.630	
Ca	Ca	Si	Si	Ga	Ga	Ga	Sc	2.586	0.243	Zn	Zn	Zn	Zn	Si	Si	Ge	Sn	3.152	1.214	Be	Be	Sr	Sr	Si	Si	Si	Zr	3.566	0.868	Be	Ca	Ca	Ca	Si	Si	Ti	Ti	4.525	0.572	
Ba	Ba	Si	Sn	Y	Y	Y	Y	2.587	0.223	Sr	Sr	Si	Hf	Y	Y	Y	Y	3.152	1.041	Be	Be	Sr	Sr	Ge	Ti	Ti	Ti	3.566	0.617	Be	Mg	Mg	Mg	Sn	Sn	Ti	Ti	4.526	0.696	
Sr	Zn	Cd	Cd	Zr	Zr	Zr	Zr	2.587	0.219	Ca	Ca	Ge	Zr	Y	Y	Y	Y	3.152	1.050	Mg	Sr	Ba	Ba	Zr	Zr	Zr	Zr	3.566	0.687	Mg	Mg	Mg	Zn	Si	Si	Si	Ge	4.526	0.820	
Be	Be	Ca	Sr	Sn	Sn	Sn	Sn	2.587	-0.407	Ba	Ba	Cd	Si	Si	Si	Si	3.152	1.073	Mg	Mg	Mg	Ba	Zr	Zr	Zr	Hf	3.566	0.738	Be	Be	Mg	Mg	Ge	Zr	Zr	Zr	4.527	1.017		
Zn	Zn	Hf	Hf	In	In	In	Sc	2.588	-0.495	Ca	Ca	Si	Si	In	Sc	Sc	Sc	3.153	1.121	Be	Be	Hf	Hf	Ga	Ga	Ga	In	3.566	0.552	Mg	Mg	Mg	Ca	Si	Si	Si	Zr	4.529	0.651	
Ba	Ba	Cd	Cd	Ti	Ti	Zr	Zr	2.588	-0.483	Cd	Cd	Zr	Zr	Al	Al	Sc	Sc	3.153	1.012	Sr	Sr	Ba	Ba	Si	Si	Si	Sn	3.567	0.461	Mg	Mg	Mg	Zn	Si	Si	Si	Ti	4.531	0.589	
Ba	Ba	Ba	Cd	Si	Ge	Ge	Ge	2.588	-0.254	Mg	Ba	Cd	Cd	Hf	Hf	Hf	Hf	3.155	1.043	Ca	Ca	Sr	Sr	Si	Si	Hf	Hf	3.567	0.447	Mg	Mg	Mg	Ca	Si	Si	Ti	Ti	4.532	0.395	
Ca	Ca	Ca	Zn	Si	Sn	Sn	Sn																																	

Cd	Cd	Sn	Hf	Y	Y	Y	Y	2.617	0.940	Sr	Cd	Zr	Zr	Y	Y	Y	Y	3.175	0.939	Be	Be	Ge	Zr	Ga	Ga	Ga	Ga	3.588	0.465	Mg	Ca	Ca	Ca	Si	Si	Si	Ti	4.743	0.683
Be	Sr	Sr	Ba	Sn	Sn	Sn	Sn	2.617	1.127	Sr	Sr	Sr	Sr	Sn	Sn	Zr	Hf	3.175	0.890	Be	Zn	Zn	Zn	Sn	Zr	Zr	Zr	3.589	0.644	Mg	Mg	Mg	Mg	Sn	Ti	Ti	Zr	4.749	0.921
Sr	Zn	Cd	Cd	Hf	Hf	Hf	Hf	2.618	1.154	Zn	Cd	Cd	Cd	Sn	Ti	Ti	Ti	3.175	0.812	Ca	Ca	Ba	Ba	Si	Si	Si	Sn	3.589	0.456	Mg	Mg	Mg	Mg	Si	Si	Ge	Hf	4.758	1.186
Zn	Zn	Ge	Ge	Al	Al	Al	In	2.618	0.721	Zn	Zn	Zn	Cd	Si	Hf	Hf	Hf	3.176	0.936	Be	Sr	Sr	Sr	Sn	Hf	Hf	Hf	3.589	0.635	Be	Be	Mg	Mg	Si	Si	Si	Zr	4.762	0.634
Cd	Cd	Hf	Hf	Ga	Ga	Ga	Y	2.618	0.706	Be	Be	Hf	Hf	Ga	Ga	In	In	3.176	0.998	Sr	Zn	Ti	Ti	Sc	Sc	Sc	Sc	3.589	0.725	Be	Mg	Mg	Mg	Si	Ge	Ge	Ge	4.772	0.585
Ba	Ba	Ba	Cd	Sn	Zr	Zr	Zr	2.618	0.692	Zn	Zn	Sn	Hf	Al	Al	Al	Al	3.177	0.892	Ca	Ca	Ca	Ba	Si	Si	Zr	Zr	3.589	0.339	Be	Mg	Ca	Ca	Si	Si	Si	Si	4.785	0.782
Sr	Cd	Cd	Cd	Si	Si	Ti	Ti	2.619	0.714	Zn	Cd	Cd	Cd	Zr	Zr	Zr	Hf	3.177	0.922	Ca	Ca	Ca	Sr	Zr	Zr	Hf	Hf	3.589	0.701	Be	Be	Si	Si	Al	Al	Al	Sc	4.788	0.883
Ca	Ca	Sn	Hf	Al	Al	Al	Al	2.620	0.691	Mg	Ba	Hf	Hf	Al	Al	Al	Al	3.177	1.002	Ca	Zn	Ti	Ti	Y	Y	Y	Y	3.589	0.988	Mg	Mg	Mg	Mg	Ge	Ti	Ti	Hf	4.788	1.078
Sr	Cd	Cd	Cd	Zr	Hf	Hf	Hf	2.620	0.681	Mg	Mg	Cd	Cd	Ti	Ti	Hf	Hf	3.177	0.877	Be	Ba	Ba	Ba	Ti	Ti	Zr	Zr	3.590	0.502	Mg	Mg	Mg	Mg	Si	Si	Zr	Hf	4.796	0.734
Ba	Ba	Ba	Cd	Si	Zr	Zr	Zr	2.622	0.710	Be	Be	Be	Cd	Ti	Ti	Ti	Hf	3.177	0.917	Mg	Mg	Mg	Ba	Ge	Ge	Zr	Zr	3.590	0.864	Mg	Mg	Mg	Mg	Si	Si	Ge	Zr	4.797	0.659
Sr	Cd	Cd	Cd	Si	Si	Si	Zr	2.623	0.705	Mg	Ba	Ba	Cd	Si	Si	Si	Si	3.177	1.130	Ca	Ca	Sr	Sr	Si	Si	Zr	Zr	3.590	1.083	Be	Mg	Si	Si	Al	Al	Al	Al	4.798	0.803
Zn	Zn	Zn	Zn	Si	Sn	Sn	Zr	2.623	0.703	Cd	Cd	Ti	Ti	Al	Al	Al	Ga	3.177	1.115	Sr	Ba	Ba	Ba	Si	Ti	Ti	Ti	3.590	0.142	Be	Be	Mg	Zn	Si	Si	Si	Si	4.798	0.886
Cd	Cd	Ge	Ge	Sc	Sc	Y	Y	2.625	0.685	Sr	Sr	Sr	Sr	Si	Ge	Sn	Sn	3.177	1.121	Sr	Sr	Sr	Sr	Si	Si	Zr	Ti	3.591	0.203	Be	Mg	Mg	Mg	Ti	Ti	Ti	Hf	4.800	1.071
Zn	Zn	Zn	Zn	Ge	Sn	Sn	Zr	2.626	0.597	Ca	Ca	Zn	Zn	Ge	Zr	Zr	Zr	3.177	1.250	Mg	Mg	Ba	Ba	Si	Zr	Zr	Zr	3.591	0.183	Be	Be	Mg	Ca	Si	Si	Si	Si	4.813	0.755
Sr	Sr	Zn	Cd	Ti	Ti	Ti	Ti	2.627	0.574	Sr	Sr	Zn	Zn	Ti	Hf	Hf	Hf	3.177	1.183	Mg	Mg	Si	Sn	Sc	Sc	Sc	Sc	3.591	1.081	Mg	Mg	Mg	Mg	Ge	Ti	Ti	Zr	4.820	0.675
Sr	Sr	Zn	Zn	Ge	Ge	Ti	Ti	2.627	0.787	Ba	Ba	Ba	Zn	Zr	Zr	Hf	Hf	3.178	1.295	Mg	Mg	Sr	Sr	Sn	Hf	Hf	Hf	3.591	0.923	Be	Mg	Mg	Mg	Ti	Ti	Ti	Zr	4.826	0.171
Be	Be	Sn	Ti	In	In	In	In	2.627	0.553	Zn	Zn	Cd	Cd	Zr	Hf	Hf	Hf	3.178	1.184	Mg	Zn	Zn	Zn	Si	Ge	Ge	Ge	3.592	0.726	Be	Mg	Mg	Mg	Si	Si	Hf	Hf	4.827	0.915
Be	Be	Be	Ba	Ge	Ge	Sn	Sn	2.627	0.448	Ca	Ca	Sr	Sr	Ge	Ge	Sn	Sn	3.178	1.025	Mg	Ba	Ba	Ba	Si	Hf	Hf	Hf	3.592	1.329	Mg	Mg	Mg	Mg	Si	Ti	Ti	Hf	4.829	1.328
Mg	Mg	Sn	Sn	Al	Al	Sc	Sc	2.628	0.802	Be	Be	Sn	Sn	Al	Al	Al	In	3.179	1.229	Sr	Ba	Ba	Ba	Si	Si	Ti	Ti	3.592	1.117	Be	Mg	Mg	Mg	Sn	Ti	Ti	Ti	4.852	0.103
Sr	Zn	Zn	Zn	Ge	Ge	Ge	Zr	2.629	0.610	Ba	Cd	Ti	Ti	Al	Al	Al	Al	3.179	1.154	Mg	Mg	Sr	Sr	Zr	Zr	Hf	Hf	3.592	0.812	Be	Mg	Mg	Mg	Ge	Ge	Ge	Ti	4.853	0.217
Ca	Zn	Zn	Sn	Sn	Sn	Zr	Zr	2.630	0.615	Sr	Sr	Ba	Ba	Ge	Ge	Sn	Sn	3.179	1.217	Mg	Mg	Ca	Ca	Si	Si	Sn	Sn	3.593	0.526	Mg	Mg	Mg	Mg	Si	Ge	Ge	Ti	4.860	0.481
Sr	Sr	Zr	Zr	Ga	Ga	Y	Y	2.631	0.792	Zn	Zn	Hf	Hf	Al	Al	Al	In	3.179	1.368	Ba	Ba	Ba	Ba	Si	Si	Sn	Ti	3.593	0.646	Mg	Mg	Mg	Mg	Si	Ti	Ti	Zr	4.861	1.259
Mg	Mg	Si	Ti	In	In	In	In	2.631	0.429	Zn	Cd	Cd	Cd	Si	Si	Hf	Hf	3.180	0.881	Mg	Ba	Zn	Zn	Ti	Ti	Ti	Ti	3.593	0.618	Be	Be	Be	Mg	Si	Si	Si	Ti	4.862	1.669
Cd	Cd	Zr	Zr	Al	Al	Y	Y	2.632	0.559	Cd	Cd	Si	Zr	Y	Y	Y	Y	3.180	1.006	Be	Be	Mg	Sr	Ti	Ti	Ti	Ti	3.593	0.644	Be	Be	Mg	Mg	Si	Si	Ti	Ti	4.862	0.355
Ca	Ca	Cd	Cd	Si	Si	Ti	Ti	2.632	0.789	Ca	Ca	Ti	Ti	Al	Al	Y	Y	3.181	1.339	Ca	Ca	Ca	Sr	Ge	Zr	Zr	Zr	3.594	0.807	Be	Mg	Mg	Mg	Si	Si	Zr	Zr	4.880	0.418
Be	Be	Ge	Ge	In	In	In	Sc	2.632	0.395	Zn	Zn	Cd	Cd	Si	Si	Hf	Hf	3.181	0.835	Mg	Mg	Sr	Sr	Zr	Zr	Zr	Hf	3.594	0.712	Be	Mg	Mg	Mg	Si	Si	Si	Sn	4.892	0.889
Ba	Ba	Zr	Zr	Al	Al	Ga	Ga	2.633	0.547	Ga	Ga	In	In	Sc	Y	Y	Y	3.181	0.965	Be	Be	Ba	Ba	Ge	Ge	Hf	Hf	3.594	1.468	Be	Mg	Mg	Zn	Si	Si	Si	Si	4.912	1.582
Be	Be	Mg	Sr	Sn	Sn	Sn	Sn	2.633	0.860	Mg	Mg	Ge	Ge	Al	Al	Al	Y	3.181	1.331	Mg	Mg	Zn	Zn	Si	Si	Hf	Hf	3.594	1.402	Be	Mg	Mg	Mg	Ge	Ge	Ti	Ti	4.924	1.951
Sr	Zn	Zn	Cd	Zr	Zr	Zr	Zr	2.634	0.711	Ca	Ca	Zn	Zn	Ti	Ti	Zr	Zr	3.182	1.178	Ca	Ca	Si	Si	Sc	Y	Y	Y	3.595	1.280	Be	Mg	Mg	Mg	Ge	Ti	Ti	Ti	4.931	0.732
Ca	Cd	Ge	Ge	Al	Al	Al	Al	2.634	0.640	Cd	Cd	Hf	Hf	Al	Al	Al	Sc	3.182	1.089	Ca	Ca	Ca	Zn	Ti	Ti	Ti	Zr	3.595	0.681	Mg	Mg	Mg	Mg	Si	Si	Ti	Hf	4.933	0.722
Ba	Ba	Ge	Ti	Al	Al	Al	Al	2.634	0.867	Zn	Zn	Zn	Cd	Ti	Ti	Ti	Zr	3.182	1.185	Mg	Mg	Zr	Zr	Sc	Y	Y	Y	3.595	0.914	Mg	Mg	Mg	Mg	Si	Ge	Ti	Ti	4.945	0.422
Zn	Zn	Ti	Ti	In	In	In	Sc	2.635	0.772	Zn	Zn	Cd	Cd	Si	Zr	Zr	Zr	3.183	1.118	Cd	Cd	Si	Ti	Sc	Sc	Sc	Sc	3.595	1.040	Be	Be	Be	Mg	Si	Si	Si	Ge	4.946	0.861
Zn	Zn	Hf	Hf	In	Y	Y	Y	2.635	0.842	Ca	Ca	Ca	Zn	Ge	Ge	Hf	Hf	3.183	1.267	Be	Be	Cd	Cd	Si	Si	Si	Zr	3.595	0.814	Be	Be	Si	Ti	Al	Al	Al	Al	4.960	1.159
Sr	Sr	Si	Sn	Y	Y	Y	Y	2.636	0.840	Al	Al	Ga	In	In	In	Sc	Sc	3.183	1.323	Be	Be	Si	Ge	Y	Y	Y	Y	3.596	1.063	Be	Mg	Mg	Mg	Si	Si	Ge	Ge	4.964	0.396
Ba	Zn	Zn	Zn	Ti	Ti	Hf	Hf	2.637	0.573	Ga	Ga	In	In	Sc	Sc	Y	Y	3.183	0.828	Mg	Ca	Ba	Ba	Ti	Ti	Ti	Ti	3.596	1.107	Mg	Mg	Mg	Mg	Si	Si	Ti	Zr	4.966	0.447
Ba	Zn	Zn	Zn	Si	Si	Hf	Hf	2.638	0.797	Ba	Zn	Zr	Zr	Y	Y	Y	Y	3.183	1.041	Ca	Ca	Ca	Ba	Sn	Ti	Ti	Ti	3.596	0.740	Be	Mg	Mg	Mg	Si	Ti	Ti	Ti	4.988	0.569
Be	Sr	Ge	Ge	Al	Al	Al	Al	2.639	0.834	Zn	Zn	Si	Si	Al	Al	Ga	Ga	3.184	1.296	Mg	Mg	Sr	Ba	Ti	Ti	Ti	Ti	3.596	1.112	Be	Be	Mg	Mg	Si	Si	Si	Ti	5.037	0.828
Sr	Zn	Zn	Cd	Ti	Ti	Ti	Ti	2.641	0.535	Be	Be	Cd	Cd	Zr	Zr	Zr	Hf	3.185	0.780	Be	Be	Ba	Ba	Ge	Ge	Zr	Zr	3.596	1.347	Mg	Mg	Mg	Mg	Si	Si	Ge	Ti	5.042	1.049
Ca	Cd	Cd	Cd	Ge	Ge	Ge	Ti	2.641	0.787	Ba	Ba	Ba	Zn	Si	Ti	Ti	Ti	3.185	0.998	Be	Be	Si	Zr	Y	Y	Y	Y	3.596	0.844	Be	Mg	Mg	Ca	Si	Si	Si	Si	5.068	0.566
Ba	Ba	Hf	Hf	Al	Al	Ga	Ga	2.642	0.907	Zn	Zn	Zn	Cd	Ti	Hf	Hf	Hf	3.186	1.289	Mg	Sr	Ba	Ba	Hf	Hf	Hf	Hf	3.597	1.254	Be	Be	Mg	Mg	Si	Si	Si	Ge	5.091	0.589
Ba	Ba	Ti	Zr	Ga	Ga	Ga	Ga	2.642	1.030	Ca	Ca	Hf	Hf	Al	Al	Al	Sc	3.186	1.133	Mg	Zn	Zn	Zn	Sn	Zr	Zr	Zr	3.597	1.429	Be	Mg	Mg	Mg	Si	Si	Si	Hf	5.166	0.600
Sr	Cd	Cd	Cd	Si	Hf	Hf	Hf	2.643	1.138	Ca	Ca	Si	Ge	Y	Y	Y	Y	3.187	1.391	Mg	Mg	Zn	Zn	Ge	Zr	Zr	Zr	3.597	0.493	Be	Mg	Mg	Mg	Si	Si	Ti	Ti	5.189	0.834
Ca	Ca	Cd	Cd	Ti	Ti	Hf	Hf	2.643	0.869	Zn	Zn	Si	Si	Al	Al	Y	Y	3.187	1.343	Mg	Mg	Ca	Ca	Sn	Sn	Sn	Hf	3.597	0.595	Be	Mg	Mg	Mg	Si	Si	Si	Zr	5.201	1.042
Zn	Zn	Zr	Zr	In	In	In	Sc	2.643	0.844	Be	Be	Be	Mg	Sn	Sn	Sn	Hf	3.187	0.832	Be	Ba	Ba	Ba	Ti	Ti	Hf	Hf	3.597	0.580	Be	Mg	Mg	Mg	Si	Si	Si	Ge	5.313	0.598
Sr	Zn	Zn	Zn	Ge	Ge	Zr	Zr	2.643	1.092	Ba	Zn	Zn	Zn	Si	Si	Si	Ge	3.187	1.158	Ca	Ca	Ca	Zn	Ge	Ge	Ge	Ti	3.598	0.367	Be	Mg	Mg	Mg	Si	Si				

Table S4 (e): 5 types of cations

Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)									
Mg	Ba	Sn	Sn	In	In	In	Y	0.151	0.244	Ba	Ba	Ba	Cd	Ge	Sn	Sn	Zr	2.419	0.398	Mg	Ba	Cd	Cd	Ti	Ti	Zr	Zr	2.925	0.668	Sr	Sr	Ba	Ba	Ge	Ti	Zr	Zr	3.393	0.299																				
Be	Ba	Sn	Sn	Ga	In	In	In	0.159	0.121	Sr	Sr	Si	Zr	Al	Ga	Ga	Ga	2.419	0.266	Mg	Mg	Sn	Ti	In	Y	Y	Y	2.925	1.190	Be	Sr	Ba	Ba	Sn	Sn	HF		3.393	0.325																				
Be	Ba	Sn	Sn	In	In	In	Y	0.184	0.052	Mg	Ba	Si	Si	Al	Ga	Ga	Ga	2.419	0.232	Mg	Mg	Ti	HF	Al	In	In	In	2.925	1.507	Be	Be	Mg	Zn	Si	Zr	Zr	Zr	3.393	0.247																				
Mg	Ba	Sn	Sn	Ga	In	In	In	0.212	0.046	Be	Mg	Ge	Ge	Ga	Ga	Y	Y	2.419	0.472	Be	Ca	Ca	Cd	Sn	HF	HF	HF	2.925	0.450	Be	Be	Sr	Ba	Sn	Sn	Zr	Zr	3.393	0.342																				
Be	Ba	Ge	Sn	In	In	In	In	0.229	0.385	Be	Zn	Zr	HF	In	In	In	In	2.419	0.487	Zn	Zn	Sn	Zr	Al	Al	Al	Ga	2.925	0.374	Be	Zn	Si	Sn	Sc	Sc	Sc	Sc	3.393	0.567																				
Ba	Cd	Sn	Sn	Ga	In	In	Y	0.235	0.311	Zn	Zn	HF	HF	Ga	In	Y	Y	2.419	0.395	Be	Be	Be	Zn	Si	Sn	HF	HF	2.925	0.314	Be	Be	Ca	Sr	Sn	HF	HF	HF	3.393	1.099																				
Ba	Cd	Sn	Sn	Ga	In	In	In	0.236	0.314	Be	Ba	Si	Sn	Sc	Sc	Sc	Sc	2.420	0.500	Mg	Sr	Sr	Cd	Ge	Ti	Ti	Ti	2.925	0.616	Mg	Mg	Zr	Zr	Ga	Ga	In	Sc	3.394	1.106																				
Mg	Sr	Sn	Sn	Ga	In	In	Y	0.245	0.358	Ca	Ca	Si	Si	Ga	In	Y	Y	2.420	0.391	Be	Sr	Ti	Ti	Al	Al	Ga	Ga	2.926	0.910	Ca	Ca	Sr	Sr	Si	Sn	Zr	Zr	3.394	0.983																				
Sr	Cd	Sn	Sn	Ga	In	In	In	0.264	0.367	Sr	Sr	HF	HF	Al	In	Y	Y	2.420	0.357	Ca	Sr	Sr	Cd	Ge	Ti	Ti	Ti	2.926	0.265	Mg	Mg	Ge	Zr	In	Sc	Sc	Sc	3.394	0.593																				
Be	Sr	Sn	Sn	Ga	In	In	In	0.268	0.660	Be	Sr	Zr	Zr	Ga	Ga	In	In	2.420	0.505	Be	Be	Ba	Cd	Si	Si	Ge	Ge	2.926	0.259	Be	Ca	Ca	Sr	Ge	Ge	Ge	Sn	3.394	0.917																				
Ba	Cd	Sn	Sn	Al	In	In	In	0.271	0.291	Sr	Cd	Zr	Zr	Ga	Ga	In	In	2.420	0.370	Sr	Sr	Ba	Cd	Si	Si	Si	Zr	2.926	0.416	Mg	Ca	Sr	Sr	Sn	Sn	Sn	Zr	3.394	0.792																				
Ba	Cd	Ge	Sn	In	In	In	In	0.273	0.204	Ca	Cd	Cd	Cd	Si	Ge	Ge	Zr	2.420	0.349	Be	Cd	Ge	Sn	Al	Al	Al	Al	2.926	0.573	Zn	Cd	Ti	Ti	Al	Al	Al	Y	3.394	0.570																				
Sr	Cd	Sn	Sn	In	In	In	Y	0.286	0.204	Sr	Sr	Cd	Cd	Sn	Ti	Ti	Zr	2.420	0.564	Zn	Zn	Si	Si	Al	In	Sc	Sc	2.926	0.841	Mg	Mg	Ca	Ba	Ge	Ge	Ge	Sn	3.394	0.972																				
Mg	Ba	Ge	Sn	In	In	In	In	0.289	0.256	Ba	Ba	Si	Zr	Ti	Al	In	In	2.420	0.786	Sr	Cd	Si	Si	Al	Al	Sc	Sc	2.926	0.449	Be	Be	Sr	Zn	Si	Si	Zr	Zr	3.394	0.845																				
Ca	Ba	Sn	Sn	Ga	In	In	Y	0.292	0.261	Zn	Zn	Ge	Ti	Ga	Ga	In	In	2.420	0.699	Be	Zn	Ti	Ti	Al	Al	In	In	2.926	0.448	Zn	Cd	Si	Si	Sc	Sc	Y	Y	3.394	0.704																				
Mg	Sr	Sn	Sn	Ga	In	In	In	0.296	0.533	Be	Cd	Ge	Ge	Al	Al	Ga	Ga	2.420	0.577	Sr	Sr	Ti	Zr	Al	Al	Al	Ga	2.927	0.441	Mg	Mg	Ba	Ba	Sn	HF	HF	HF	3.394	1.010																				
Be	Ba	Sn	Sn	Al	In	In	In	0.298	0.052	Be	Ba	Si	HF	Ga	Ga	Ga	Ga	2.421	0.706	Be	Ca	Zn	Zn	Si	Ge	Ge	Ge	Sn	2.927	0.576	Be	Be	Ba	Zn	Ge	Ti	Ti	Zr	3.394	0.761																			
Sr	Cd	Ge	Sn	In	In	In	In	0.303	0.048	Be	Mg	Mg	Cd	Si	Sn	Sn	Sn	2.421	0.669	Mg	Ca	Zn	Si	Si	Al	Ga	Ga	2.927	0.840	Be	Be	Sr	Sr	Ge	Zr	HF	HF	3.394	0.693																				
Sr	Cd	Sn	Sn	Al	In	In	In	0.304	0.346	Sr	Cd	Si	Si	Al	Al	Ga	Ga	2.421	0.580	Ba	Zn	Si	Si	Si	Al	Al	Ga	2.927	0.484	Mg	Mg	Ba	Zn	Ge	HF	HF	HF	3.394	1.083																				
Be	Sr	Sn	Sn	In	In	In	Y	0.304	0.196	Ba	Ba	HF	HF	Al	Ga	In	In	2.421	0.686	Be	Be	Mg	Sr	Ge	Ge	Sn	Sn	2.927	0.483	Mg	Mg	Zr	Zr	Zr	Al	Sc	Y	Y	3.395	0.813																			
Mg	Ba	Sn	Sn	In	In	In	Sc	0.308	0.175	Ba	Ba	Sn	Zr	Ga	Sc	Sc	Sc	2.421	0.661	Be	Sr	HF	HF	Sc	Sc	Sc	Y	2.927	0.813	Mg	Ba	Ba	Ba	Sn	Zr	HF	HF	3.395	0.401																				
Mg	Ba	Sn	Sn	Al	In	In	In	0.312	0.091	Be	Cd	HF	HF	In	In	In	Y	2.421	0.354	Ca	Ca	Ca	Cd	Si	Ge	Ge	HF	2.927	1.341	Be	Be	HF	HF	Al	Sc	Sc	Y	3.395	0.508																				
Zn	Cd	Sn	Sn	Ga	In	In	In	0.316	0.095	Ba	Cd	Sn	Ti	Al	Al	Al	Al	2.421	0.298	Mg	Sr	Zr	Zr	Ga	Ga	Ga	Sc	2.927	1.650	Be	Zn	Zr	Zr	Al	Al	Ga	Ga	3.395	0.519																				
Be	Ba	Sn	Sn	In	In	In	Sc	0.326	0.183	Sr	Zn	Cd	Cd	Si	Ge	Ge	Ge	2.422	0.248	Zn	Zn	Si	Si	Ga	Ga	Sc	Y	2.927	0.559	Mg	Ba	Si	Si	Sc	Sc	Y	Y	3.395	0.781																				
Sr	Ba	Sn	Sn	In	In	In	Y	0.326	0.195	Cd	Cd	Si	Sn	Al	Al	Sc	Sc	2.422	0.363	Mg	Mg	Ti	Zr	Ga	In	In	In	2.928	0.450	Mg	Ca	Sr	Sr	Sn	Sn	HF	HF	3.395	1.061																				
Ca	Sr	Sn	Sn	In	In	In	Y	0.329	0.486	Ca	Ca	Ti	Zr	In	In	Y	Y	2.422	0.291	Be	Ca	Ba	Cd	Ti	Ti	Ti	Ti	2.928	0.433	Ca	Sr	Sr	Sr	Sn	Ti	HF	HF	3.395	0.920																				
Be	Sr	Ge	Sn	In	In	In	In	0.339	-0.018	Ca	Ca	Ge	Ti	Al	Al	In	In	2.422	0.237	Ca	Sr	Sr	Cd	Ge	Ge	Ge	Ti	2.928	0.742	Mg	Ca	Si	HF	Y	Y	Y	Y	3.395	0.771																				
Cd	Cd	Ge	Sn	Ga	In	In	In	0.357	-0.016	Sr	Sr	Zn	Ti	Al	Al	Y	Y	2.422	0.360	Ca	Ca	Si	Si	Al	Al	Ga	Sc	2.928	1.028	Ca	Zn	Zr	Zr	Ga	Sc	Sc	Sc	3.395	1.130																				
Mg	Sr	Ge	Sn	In	In	In	In	0.373	0.302	Sr	Zn	Zr	Zr	Ga	Ga	Y	Y	2.422	0.350	Be	Be	Sr	Cd	Si	Ge	Ge	Ge	2.928	0.348	Ca	Ca	Sr	Ba	Ti	Ti	Zr	Zr	3.395	0.971																				
Cd	Cd	Sn	Sn	Al	Ga	In	In	0.380	0.165	Sr	Sr	Cd	Cd	Ti	Ti	Zr	HF	2.423	0.341	Be	Be	Be	Ca	Ge	Sn	Sn	Zr	2.928	0.310	Mg	Mg	HF	HF	Al	In	Sc	Sc	3.395	0.509																				
Ba	Cd	Sn	Sn	Ga	Ga	In	In	0.388	-0.142	Ba	Ba	Ti	Ti	Al	Ga	In	In	2.423	0.666	Be	Be	HF	HF	Ga	Sc	Y	Y	2.928	0.521	Be	Ca	Sr	Ba	Ge	Ge	Ge	Ge	3.395	0.612																				
Ba	Zn	Sn	Sn	Ga	In	In	Y	0.390	-0.153	Be	Zn	Si	Sn	Ga	Ga	Ga	Ga	2.423	0.593	Mg	Mg	Si	Sn	In	Sc	Sc	Sc	2.928	0.686	Mg	Mg	Sr	Sr	Si	Si	Sn	HF	3.395	0.703																				
Zn	Cd	Sn	Sn	Al	In	In	In	0.390	0.120	Ba	Ba	Ti	Zr	Ga	Ga	Ga	Y	2.423	0.528	Ca	Cd	Ti	Ti	In	Y	Y	Y	2.928	0.946	Mg	Ca	Ti	Ti	Al	Al	Al	In	3.396	0.544																				
Ba	Cd	Sn	Sn	In	In	In	Sc	0.393	-0.003	Ca	Ca	Si	HF	Ga	Ga	In	In	2.423	0.796	Sr	Zn	Ge	Zr	Y	Y	Y	Y	2.929	0.518	Ca	Sr	Sr	Ba	Ti	Ti	Zr	Zr	3.396	0.662																				
Zn	Cd	Ge	Sn	In	In	In	In	0.394	-0.303	Sr	Sr	Zr	HF	In	In	Sc	Sc	2.423	0.584	Cd	Cd	Ge	Zr	Ga	Sc	Sc	Sc	2.929	0.488	Ca	Sr	Ba	Ba	Ge	Ge	Ge	Sn	3.396	0.942																				
Mg	Sr	Sn	Sn	Al	In	In	In	0.398	-0.235	Ba																																																	

Sr	Zn	Sn	Ga	Ga	In	In	0.668	0.287	Ca	Sr	Si	Si	Al	Ga	Ga	2.436	0.172	Zn	Cd	Sn	Zr	Al	Al	Al	2.938	0.678	Be	Cd	Si	Ti	Y	Y	Y	3.405	0.690			
Be	Cd	Sn	Sn	Ga	In	In	0.678	0.241	Ba	Zn	Hf	Hf	In	In	Sc	2.436	0.167	Cd	Cd	Si	Si	Al	Ga	Sc	2.938	0.926	Zn	Cd	Si	Si	Al	Al	Al	3.405	0.780			
Ca	Cd	Sn	Sn	Al	Ga	In	0.679	0.202	Sr	Sr	Zn	Zn	Si	Si	Sn	2.436	0.485	Mg	Mg	Sn	Ti	Al	Al	Y	2.938	1.033	Mg	Mg	Si	Zr	Ga	Sc	3.405	0.727				
Ba	Ba	Sn	Sn	Al	Ga	Ga	0.680	0.196	Mg	Sr	Cd	Cd	Ge	Ge	Zr	2.436	0.394	Sr	Sr	Si	Ge	Sc	Y	Y	2.938	1.240	Be	Be	Cd	Cd	Si	Si	Ti	3.405	0.720			
Cd	Cd	Sn	Sn	Al	Ga	In	0.682	0.113	Ba	Ba	Ba	Cd	Cd	Sn	Sn	Ti	2.436	0.305	Be	Ba	Si	Si	Al	Al	Y	2.938	0.832	Be	Be	Cd	Ba	Ge	Zr	Zr	3.405	0.657		
Ba	Cd	Ge	Ge	Ga	In	In	0.685	0.100	Mg	Ba	Ge	Hf	Al	Al	Sc	2.437	0.515	Be	Ca	Si	Sn	Sc	Sc	Sc	2.938	0.707	Be	Be	Mg	Sr	Ge	Ge	Ge	3.405	0.666			
Ca	Zn	Sn	Sn	Ga	In	In	0.686	0.112	Mg	Mg	Ba	Cd	Cd	Sn	Sn	Hf	2.437	0.311	Ca	Ca	Si	Hf	Al	Al	Y	2.938	0.759	Be	Be	Be	Ca	Ti	Ti	Hf	3.406	0.664		
Ca	Ca	Sn	Sn	Al	In	In	0.687	0.408	Sr	Ba	Ge	Ge	Sc	Sc	Sc	Y	2.437	0.253	Ba	Cd	Ti	Ti	Al	Al	Sc	2.939	0.856	Mg	Mg	Ge	Zr	Al	Al	In	3.406	0.660		
Ca	Ba	Sn	Sn	Ga	Ga	In	0.688	0.396	Ba	Zn	Zn	Cd	Si	Si	Sn	2.437	0.519	Cd	Cd	Si	Hf	Al	Al	Al	Ga	2.939	1.056	Ca	Ca	Ba	Zn	Ge	Ge	Ge	3.406	0.672		
Ca	Sr	Sn	Sn	Ga	Ga	In	0.688	0.408	Ca	Ca	Zn	Zn	Ge	Sc	Hf	Hf	2.437	0.292	Al	Ga	In	In	In	Sc	Y	2.939	0.680	Ca	Sr	Sr	Ba	Ge	Ge	Ge	3.406	0.670		
Mg	Sr	Sn	Sn	In	In	Y	0.690	0.358	Sr	Sr	Zr	Zr	Al	In	In	Sc	2.438	0.243	Be	Be	Zn	Cd	Sn	Hf	Hf	Hf	2.939	0.580	Ca	Zn	Si	Ge	Y	Y	Y	3.406	0.734	
Sr	Ba	Sn	Sn	Ga	Ga	In	0.692	0.480	Be	Cd	Si	Ti	Ga	Ga	In	2.438	0.509	Sr	Sr	Zn	Zn	Ge	Ti	Ti	Zr	2.939	0.775	Mg	Ca	Ca	Zr	Y	Y	Y	3.406	0.793		
Ba	Ba	Sn	Sn	Ga	Ga	In	0.694	0.468	Be	Ba	Si	Si	Al	Ga	Ga	2.438	0.385	Mg	Ba	Ge	Ti	Al	Al	Al	2.939	0.852	Be	Be	Be	Zn	Si	Si	Sn	Ti	3.406	0.695		
Be	Ba	Sn	Sn	In	In	Sc	0.694	0.471	Be	Ba	Sn	Zr	Y	Y	Y	2.438	0.346	Ba	Ba	Zn	Zr	Zr	Al	Y	Y	2.939	1.048	Mg	Sr	Zn	Zn	Ge	Hf	Hf	3.406	0.747		
Sr	Sr	Sn	Sn	Al	Ga	Ga	0.696	0.407	Ba	Zn	Hf	Hf	Ga	Ga	Y	2.438	0.597	Ca	Sr	Ti	Ti	Al	Al	Y	2.939	0.707	Zn	Zn	Si	Zr	Al	Al	Sc	3.406	0.816			
Be	Sr	Sn	Sn	Ga	Ga	In	0.696	0.516	Sr	Zn	Hf	Hf	Al	Al	In	2.438	0.622	Be	Be	Sr	Cd	Ge	Ge	Ge	Ti	2.939	0.608	Be	Be	Zn	Zn	Ge	Ti	Zr	3.406	0.699		
Ba	Cd	Sn	Sn	Ga	Ga	Ga	0.696	-0.848	Sr	Cd	Ti	Hf	Ga	Ga	Ga	2.438	0.523	Mg	Ca	Ti	Ti	Al	Al	In	In	2.940	0.829	Be	Mg	Sr	Ba	Ge	Ge	Ge	3.406	0.698		
Sr	Sr	Sn	Sn	Al	Ga	In	0.697	-0.908	Sr	Ba	Si	Zr	Zr	Ga	Ga	Ga	2.438	0.610	Mg	Zn	Ge	Ge	In	Sc	Sc	2.940	0.892	Ca	Ca	Ba	Ba	Sn	Sn	Ti	Zr	3.406	0.718	
Ba	Cd	Ge	Ge	In	In	Y	0.698	-1.032	Be	Ba	Zr	Zr	Ga	Ga	Y	2.438	0.524	Ca	Ca	Ge	Zr	Ga	Sc	Sc	2.940	1.063	Ca	Zn	Ti	Hf	Y	Y	Y	3.406	0.657			
Ca	Ca	Ge	Sn	In	In	Y	0.699	-0.829	Ba	Ba	Ti	Hf	Ga	Ga	In	2.438	0.484	Ca	Ca	Si	Zr	In	Y	Y	Y	2.940	0.736	Ca	Ca	Ba	Ba	Sn	Zr	Hf	Hf	3.406	0.688	
Sr	Ba	Sn	Sn	Ga	Ga	In	0.701	-0.878	Mg	Sr	Ti	Ti	Ga	Ga	In	2.439	0.612	Sr	Sr	Cd	Zn	Ge	Zr	Hf	Hf	2.940	0.623	Be	Mg	Cd	Cd	Si	Zr	Zr	3.406	0.726		
Sr	Cd	Sn	Sn	Al	Al	In	0.705	-1.009	Ba	Zn	Cd	Cd	Ti	Ti	Zr	2.439	0.502	Zn	Cd	Cd	Cd	Si	Ge	Ge	Ti	2.940	0.830	Ca	Ca	Si	Ti	Al	Y	Y	3.406	0.613		
Mg	Ca	Ge	Sn	In	In	In	0.705	-0.804	Ca	Sr	Sr	Cd	Ge	Sn	Sn	Zr	2.439	0.476	Mg	Mg	Zr	Cd	Ga	In	In	Y	2.940	1.353	Zn	Zn	Si	Ti	Al	Al	In	3.407	0.704	
Sr	Sr	Ge	Sn	In	In	Sc	0.707	-0.869	Ca	Sr	Cd	Ti	Al	Al	Ga	2.439	0.691	Mg	Sr	Sr	Cd	Ge	Ge	Ge	Ti	2.940	1.623	Be	Be	Sr	Sr	Sn	Ti	Ti	Zr	3.407	0.745	
Cd	Cd	Sn	Sn	Ga	Ga	In	0.707	-0.998	Zn	Zn	Sn	Hf	Al	Al	Ga	2.439	0.912	Ca	Zn	Cd	Cd	Si	Si	Si	Hf	2.940	0.504	Be	Mg	Hf	Hf	In	Sc	Sc	3.407	0.612		
Sr	Zn	Sn	Sn	In	In	Y	0.709	-0.799	Zn	Zn	Cd	Cd	Ge	Ge	Sn	Zr	2.439	0.826	Cd	Cd	Si	Ti	Ga	Y	Y	2.940	0.365	Be	Zn	Cd	Cd	Ti	Hf	Hf	Hf	3.407	0.682	
Ca	Cd	Si	Sn	In	In	In	0.709	-0.909	Sr	Ba	Ge	Hf	Al	Al	Al	2.439	0.690	Ba	Zn	Si	Zr	Al	Al	Al	Al	2.940	1.026	Mg	Mg	Mg	Ba	Si	Sn	Hf	3.407	0.698		
Sr	Sr	Sn	Sn	Ga	In	In	0.710	-0.866	Mg	Ba	Sn	Hf	Al	Al	Al	2.439	0.829	Ba	Cd	Ti	Ti	Al	Al	Al	Ga	2.940	1.482	Be	Be	Ca	Ca	Si	Si	Sn	Zr	3.407	0.580	
Ca	Zn	Ge	Sn	In	In	In	0.715	-0.561	Sr	Ba	Ti	Ti	In	In	Sc	Sc	2.440	0.794	Ba	Zn	Si	Si	Al	Al	Y	2.940	1.747	Be	Zn	Cd	Cd	Si	Hf	Hf	3.407	0.631		
Sr	Sr	Sn	Sn	Al	Ga	In	0.720	-0.582	Be	Sr	Zr	Zr	Ti	In	In	Sc	Sc	2.440	0.689	Ca	Ba	Zr	Zr	Ga	Sc	Sc	2.941	0.732	Sr	Ba	Ba	Zn	Si	Si	Ti	3.407	0.660	
Sr	Sr	Sn	Sn	In	In	Sc	Y	-0.720	Mg	Ca	Sn	Ti	Ga	Ga	Ga	2.440	0.808	Sr	Sr	Zn	Zn	Sn	Zr	Zr	Hf	2.941	0.577	Be	Be	Zn	Zn	Si	Ge	Zr	Zr	3.407	0.702	
Ba	Ba	Sn	Sn	Al	Ga	Ga	In	0.721	-0.518	Zn	Zn	Cd	Si	Sn	Sn	Ti	2.440	0.786	Be	Sr	Zr	Zr	Ga	Ga	Sc	2.941	0.681	Be	Ca	Ba	Zn	Zr	Zr	Zr	3.407	0.818		
Be	Ba	Sn	Sn	Ga	Ga	Y	0.723	-0.569	Mg	Ba	Ba	Cd	Ge	Ge	Hf	Hf	2.440	0.474	Mg	Mg	Ca	Cd	Cd	Sn	Zr	2.941	0.920	Mg	Ca	Zr	Zr	Al	Sc	Sc	3.407	0.851		
Ca	Sr	Sn	Sn	Ga	Ga	Y	0.724	-0.963	Ba	Ba	Si	Ti	Al	Ga	Ga	2.441	0.429	Cd	Cd	Cd	Cd	Ge	Ti	Zr	Hf	2.941	1.172	Ca	Zn	Ti	Ti	In	Sc	Sc	3.407	0.772		
Sr	Cd	Ge	Ge	Ga	Ga	In	0.724	-0.512	Ba	Ca	Ge	Ge	In	Sc	Sc	Sc	2.441	0.380	Zn	Zn	Si	Zr	Al	Y	Y	2.941	0.571	Sr	Ba	Ba	Ba	Si	Ti	Hf	Hf	3.407	0.361	
Mg	Ba	Sn	Sn	In	In	Sc	0.725	-0.566	Sr	Zn	Ge	Ge	Ga	Sc	Sc	Sc	2.441	0.480	Be	Be	Mg	Zn	Ge	Ge	Sn	2.941	0.493	Be	Cd	Cd	Cd	Ti	Zr	Hf	Hf	3.408	0.663	
Cd	Cd	Si	Sn	Al	In	In	0.728	-0.961	Ba	Cd	Cd	Cd	Ti	Ti	Zr	Hf	2.441	0.421	Mg	Sr	Zn	Zn	Ge	Ge	Zr	2.941	0.765	Be	Zn	Zn	Cd	Ge	Ge	Ge	Ti	3.408	0.582	
Ba	Ba	Sn	Sn	Al	Ga	In	0.728	-0.564	Cd	Cd	Si	Si	Al	Al	In	Y	2.441	0.368	Ca	Ca	Ca	Cd	Ge	Zr	Hf	Hf	2.941	0.863	Ca	Zn	Hf	Hf	Al	Al	Sc	3.408	0.298	
Ba	Ba	Ge	Sn	In	In	Sc	0.729	-0.643	Ca	Ca	Si	Si	Al	Ga	Ga	Y	2.441	0.480	Ba	Ba	Si	Zr	Ga	Sc	Sc	2.941	1.096	Mg	Zn	Hf	Hf	Ga	Ga	Sc	3.408	0.694		
Be	Ca	Ge	Sn	Al	In	In	0.730	-1.018	Ca	Sr	Si	Si	Al	Al	In	In	2.441	0.462	Mg	Sr	Zr	Zr	Al	Al	Ga	Ga	2.941	0.747	Mg	Ca	Sr	Sr	Sn	Sn	Zr	Zr	3.408	0.610
Be	Ba	Sn	Sn	Al	Al	In	0.731	-0.552	Be	Ba	Zn	Cd	Cd	Sn	Sn	Hf	2.441	0.463	Ca	Ca	Ca	Cd	Ge	Ge	Ti	Zr	2.941	0.683	Be	Sr	Zn	Zn	Si	Si	Ge	Ge	3.408	0.482
Ba	Ba	Sn	Sn	Al	In	Sc	Y	0.736	-0.643	Ba	Cd	Hf	Hf	Al	Ga	Ga	2.442	0.782	Be	Ca	Ge	Hf	Y	Y	Y	Y	2.941	0.786	Mg	Mg	Hf	Hf	Al	Ga	In	3.408	0.745	
Mg	Ba	Ge	Ge	In	In	Y	0.740	-1.023	Be	Ba	Zn	Cd	Cd	Ge	Ge	Sn	2.442	0.713	Sr	Zn	Zn	Zn	Ti	Zr	Zr	Hf	2.941	0.864	Be	Ca	Ba	Si	Zr	Zr	Zr	3.408	0.526	
Mg	Ca	Sn	Sn	Al	Al	Ga	In	0.740	-0.321	Sr	Ba	Ti	Ti	Ga	Ga	Y	2.442	0.649	Be	Be	Si	Sn	Al	Al	Y	2.941	1.094	Be	Be	Hf	Hf	Al	Al	Sc	Y	3.408	0.431	
Ca	Sr	Sn	Sn	Ga	Ga	In	0.740	-0.335	Ba	Ba	Zn	Cd	Ge	Ge	Hf	Hf	2.442	0.903	Mg	Cd	Si	Si	Ga	Ga	Sc	2.942	0.780	Be	Be	Ca	Sr	Sn	Zr	Zr	3.408	0.794		
Be	Cd	Ge	Sn	In	In	In	0.741	-0.952	Be	Be	Mg	Cd	Sn	Sn	Sn	Zr	2.442	0.702	Ba	Zn	Hf	Hf	In	Ga	Sc	Sc	2.942	0.717	Mg	Mg	Sr	Cd	Si	Si	Hf	3.408	0.554	
Mg	Ca	Sn	Sn	In	In	Sc	0.742	-0.517	Ba	Ba	Ti	Ti	Al	Ga	Ga	In	2.442	0.547	Mg	Zn	Ti	Ti	Ga	Ga	Y	2.942	1.168	Be	Be	Sn	Ti	Sc	Y	Y	3.408	0.241		
Zn	Cd	Sn	Sn	In	In	Sc	0.742	-0.541	Zn	Zn	Si	Ge	In	Y	Y	Y	2.442	0.845	Be	Sr	Sr	Sr	Si	Ge	Sn	2.942	1.630	Be	Zn	Zn	Cd	Si	Hf	Hf	3.409	0.359		
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Sr	Ba	Sn	Sn	Al	Ga	Ga	0.874	-0.195	Be	Sr	Si	Si	In	Y	Y	Y	2.452	0.219	Ba	Ba	Ge	Ti	Al	Y	Y	Y	2.951	0.624	Be	Zn	Cd	Cd	Si	Si	Ge	Ge	3.417	0.610			
Ca	Ca	Sn	Sn	In	In	Sc	Y	0.875	-0.319	Ba	Zn	Cd	Cd	Ge	Hf	Hf	Hf	2.452	0.324	Mg	Mg	Ca	Ba	Ge	Sn	Sn	Sn	2.951	1.003	Be	Be	Be	Ca	Si	Zr	Zr	Hf	3.417	0.785		
Mg	Ca	Sn	Sn	Ga	Ga	In	In	0.876	-0.283	Be	Be	Ba	Cd	Ge	Ge	Ge	Sn	2.453	0.307	Mg	Ba	Ba	Cd	Zr	Zr	Hf	Hf	2.951	0.228	Be	Be	Ge	Ge	Al	Al	Sc	Y	3.418	0.758		
Ca	Cd	Ge	Ge	Ga	Ga	In	In	0.878	0.041	Zn	Zn	Zr	Hf	Ga	Ga	In	In	2.453	0.306	Be	Ca	Ca	Sr	Cd	Sn	Sn	Sn	2.951	0.349	Ca	Ca	Ca	Zn	Ge	Ti	Zr	Zr	3.418	0.768		
Be	Ba	Sn	Sn	Ga	Ga	Ga	Sc	0.878	0.022	Ca	Ca	Zr	Hf	Ga	In	In	Y	2.453	0.204	Ca	Ca	Zn	Cd	Si	Si	Si	Ti	2.951	0.280	Ca	Sr	Ba	Ba	Zr	Zr	Zr	Hf	3.418	0.887		
Be	Sr	Ge	Ge	Ga	Ga	In	In	0.880	-0.187	Sr	Ca	Sr	Zn	Si	Sn	Sn	Sn	2.453	0.072	Zn	Cd	Si	Si	Si	Ga	Ga	Sc	2.951	0.610	Mg	Sr	Zn	Zn	Ge	Zr	Zr	Zr	3.418	0.738		
Ba	Zn	Sn	Sn	Ga	Ga	In	Y	0.881	0.016	Sr	Ca	Ge	Ge	Al	Y	Y	Y	2.453	0.108	Be	Sr	Sr	Cd	Ti	Ti	Ti	Hf	2.951	0.944	Mg	Zn	Zn	Cd	Zr	Zr	Zr	Hf	3.418	0.724		
Cd	Cd	Sn	Sn	Al	Al	Al	In	0.883	-0.007	Sr	Ba	Ba	Hf	Ge	Ge	Sn	Sn	2.453	0.329	Ca	Cd	Ti	Ti	Ti	Ga	Ga	Sc	2.951	0.400	Mg	Mg	Mg	Ba	Ge	Ge	Sn	Ti	3.418	0.907		
Mg	Cd	Si	Sn	In	In	In	In	0.883	-0.216	Be	Ca	Zn	Hf	Ga	Ga	In	In	2.454	-0.001	Be	Cd	Cd	Cd	Cd	Sn	Zr	Zr	2.951	0.506	Mg	Mg	Hf	Hf	Al	Al	In	Sc	3.418	0.737		
Ca	Ca	Sn	Sn	Al	In	In	Sc	0.884	-0.303	Sr	Sr	Cd	Cd	Si	Ti	Ti	Hf	2.454	0.056	Ca	Sr	Ti	Ti	Al	Al	Al	In	2.951	0.309	Be	Be	Sn	Zr	Ga	Ga	Ga	Sc	3.418	0.630		
Cd	Cd	Sn	Sn	In	In	Sc	Y	0.885	-0.520	Ca	Ca	Sr	Cd	Sn	Sn	Hf	Hf	2.454	0.186	Be	Be	Be	Sr	Si	Si	Sn	Zr	2.951	0.617	Zn	Zn	Ti	Hf	Al	Al	Al	Y	3.418	0.708		
Zn	Zn	Ge	Ge	Ga	Ga	In	In	0.890	-0.617	Ca	Ca	Zn	Zn	Si	Sn	Hf	Hf	2.454	-0.029	Sr	Sr	Sr	Hf	Sc	Sc	Sc	Y	2.951	0.944	Ca	Ca	Sr	Sr	Sn	Ti	Hf	Hf	3.418	0.633		
Ca	Sr	Ge	Ge	Ga	Ga	In	In	0.891	-0.340	Sr	Ba	Cd	Cd	Ti	Ti	Ti	Hf	2.454	0.034	Be	Sr	Ge	Zr	Al	Al	Al	Al	2.951	0.434	Mg	Mg	Mg	Ba	Sn	Zr	Hf	Hf	3.418	0.724		
Be	Cd	Sn	Sn	Ga	Ga	Ga	In	0.891	-0.481	Ca	Ca	Cd	Hf	Al	In	In	Y	2.454	0.285	Mg	Mg	Cd	Cd	Si	Si	Sn	Ti	2.951	0.535	Mg	Mg	Ba	Zn	Zn	Si	Ge	Ge	3.418	0.814		
Ca	Ca	Sn	Sn	Ga	Ga	In	In	0.891	-0.581	Ba	Ba	Sn	Sr	Zr	Ga	Y	Y	Y	2.454	-0.126	Mg	Mg	Ca	Cd	Ge	Ge	Ge	Sn	2.951	0.302	Mg	Zn	Zn	Cd	Ge	Ge	Ti	Ti	3.418	0.673	
Cd	Cd	Si	Sn	In	In	In	In	0.892	-0.212	Ba	Ba	Zn	Cd	Ti	Ti	Ti	Hf	2.455	-0.007	Mg	Mg	Ba	Cd	Cd	Si	Hf	Hf	Hf	2.952	0.766	Mg	Mg	Sn	Ti	Ti	Al	Al	Sc	Sc	3.418	0.686
Ca	Ba	Sn	Sn	Al	Al	In	In	0.893	-0.442	Zn	Zn	Sn	Hf	In	Y	Y	Y	2.455	0.306	Be	Be	Cd	Cd	Si	Si	Ge	Ge	Hf	2.952	1.114	Mg	Zn	Zn	Cd	Si	Si	Zr	Zr	3.419	0.833	
Ba	Ba	Sn	Sn	Al	Al	Ga	Y	0.893	-0.539	Ba	Ba	Zr	Zr	Al	In	Y	Y	2.455	-0.141	Be	Sr	Ge	Ti	Y	Y	Y	Y	2.952	0.317	Mg	Mg	Ti	Zr	Ga	Ga	Ga	In	3.419	0.672		
Ba	Zn	Ge	Ge	Ga	Ga	In	In	0.894	-0.191	Be	Be	Sn	Hf	Ga	Ga	Y	Y	2.455	-0.013	Ca	Ca	Zr	Zr	Ga	Ga	Ga	In	2.952	0.387	Mg	Zn	Zr	Hf	Y	Y	Y	Y	3.419	0.692		
Mg	Sr	Ge	Ge	Ga	Ga	In	In	0.896	-0.435	Ba	Ba	Hf	Hf	Al	Ga	Ga	In	2.455	0.406	Ca	Ca	Sr	Zn	Ge	Ge	Ge	Sn	2.952	0.408	Sr	Ba	Ba	Ba	Si	Zr	Hf	Hf	3.419	0.622		
Sr	Zn	Sn	Sn	Ga	Ga	Ga	In	0.896	-0.531	Zn	Zn	Si	Si	Cd	Ga	In	Sc	2.456	0.210	Be	Sr	Si	Hf	Y	Y	Y	Y	2.952	0.729	Be	Be	Ba	Ba	Ge	Ti	Zr	Zr	3.419	0.589		
Ca	Sr	Sn	Sn	Ga	Ga	Ga	Sc	0.896	-0.067	Ca	Ca	Cd	Cd	Si	Si	Ge	Zr	2.456	0.234	Be	Sr	Cd	Cd	Sn	Ti	Ti	Ti	2.952	1.033	Zn	Zn	Si	Hf	Ga	Ge	Sc	Sc	3.419	0.594		
Ca	Zn	Sn	Sn	In	In	Y	Y	0.897	-0.112	Be	Ba	Ba	Cd	Si	Si	Ge	Ge	2.456	0.283	Sr	Ba	Zr	Hf	Al	Al	Al	Al	2.952	0.466	Mg	Mg	Ba	Zn	Sn	Sn	Ti	Ti	3.420	0.676		
Ca	Ca	Ge	Sn	In	In	In	Sc	0.897	-0.466	Sr	Sr	Ti	Ti	Al	Ga	Ga	Y	2.457	0.233	Be	Be	Ge	Ge	Ga	Ga	Sc	Y	2.952	0.522	Be	Sr	Sr	Ba	Sn	Sn	Sn	Zr	3.420	0.758		
Sr	Ba	Sn	Sn	Al	Al	In	In	0.897	0.076	Sr	Sr	Sr	Cd	Si	Sn	Sn	Ti	2.457	0.253	Be	Sr	Ti	Ti	Ga	Sc	Sc	Sc	2.953	0.433	Be	Be	Zr	Zr	Al	In	In	Sc	3.420	0.918		
Ba	Zn	Sn	Sn	Al	Al	In	In	0.898	-0.072	Sr	Sr	Hf	Hf	Ga	Ga	In	Y	2.457	0.379	Sr	Sr	Zn	Zn	Si	Si	Ti	Ti	Zr	2.953	0.733	Ca	Ca	Zn	Si	Ti	Zr	Zr	Zr	3.420	0.894	
Ca	Ba	Sn	Sn	Ga	Ga	Ga	Ga	0.899	-0.434	Ba	Ba	Zn	Zn	Si	Si	Sn	Ti	2.457	0.139	Ca	Ca	Ca	Cd	Si	Ge	Ge	Zr	2.953	1.030	Mg	Ca	Zn	Zn	Si	Si	Zr	Zr	3.420	0.901		
Be	Ca	Sn	Sn	In	In	Y	Y	0.902	0.098	Sr	Ba	Ba	Cd	Cd	Sn	Sn	Ti	2.458	0.227	Be	Zn	Si	Sn	Y	Y	Y	Y	2.953	0.496	Mg	Mg	Mg	Cd	Sn	Ti	Ti	Hf	3.420	0.793		
Ca	Sr	Sn	Sn	In	In	Sc	Sc	0.903	-0.065	Ba	Ba	Ba	Cd	Sn	Sn	Sn	Ti	2.458	0.399	Be	Ca	Sr	Sr	Ge	Ge	Sn	Sn	2.953	0.549	Sr	Sr	Sr	Ba	Si	Ge	Ge	Sn	3.420	0.814		
Cd	Cd	Sn	Sn	Al	Al	Ga	In	0.905	-0.427	Ba	Ba	Ti	Ti	Ga	In	Y	Y	2.458	0.123	Be	Sr	Ba	Cd	Hf	Hf	Hf	Hf	2.953	0.299	Ca	Ca	Ba	Ba	Sn	Ti	Zr	Zr	3.421	0.824		
Sr	Zn	Ge	Ge	In	In	In	Y	0.910	0.160	Mg	Ba	Zr	Zr	Ga	Ga	In	In	2.459	0.223	Be	Ca	Ca	Zn	Sn	Sn	Sn	Hf	2.953	0.574	Mg	Sr	Sr	Zn	Si	Si	Si	Ge	3.421	0.746		
Be	Ca	Sn	Sn	Ga	Ga	In	In	0.911	0.014	Zn	Zn	Ge	Ge	Al	Al	Ga	Y	2.459	0.315	Be	Sr	Cd	Cd	Ge	Hf	Hf	Hf	2.953	0.847	Be	Be	Ca	Ba	Si	Si	Si	Sn	3.421	0.798		
Mg	Ba	Ge	Ge	In	In	In	Sc	0.912	-0.452	Ba	Ba	Zn	Cd	Ge	Zr	Zr	Zr	2.459	0.564	Sr	Cd	Ti	Ti	Al	Al	Al	Y	2.953	0.359	Be	Zn	Hf	Hf	Al	Sc	Sc	Sc	3.421	0.807		
Sr	Sr	Sn	Sn	Al	Al	In	Y	0.913	0.187	Zn	Cd	Ge	Sn	Y	Y	Y	Y	2.459	0.508	Ca	Zn	Zn	Cd	Sn	Ti	Ti	Ti	2.953	0.425	Be	Sr	Sr	Ba	Si	Si	Si	Sn	3.421	0.883		
Sr	Cd	Ge	Ge	Ga	Ga	Ga	In	0.914	0.019	Sr	Sr	Cd	Cd	Ge	Ti	Zr	Zr	2.460	0.403	Be	Ca	Zr	Zr	Zr	Al	Al	Y	2.953	0.325	Zn	Zn	Si	Hf	Al	Al	Al	Ga	3.421	0.929		
Mg	Ca	Sn	Sn	In	In	Y	Y	0.914	-0.451	Be	Mg	Ge	Ti	In	In	In	Y	2.460	0.501	Ca	Sr	Zr	Zr	Zr	Al	Y	Y	Y	2.953	0.580	Zn	Zn	Ti	Zr	Al	Al	Sc	Sc	3.421	0.828	
Ba	Ba	Sn	Sn	Al	Al	In	Y	0.915	0.449	Mg	Ca	Zr	Zr	In	In	In	Y	2.460	0.495	Ca	Ca	Zr	Hf	Al	Al	Y	Y	Y	2.953	0.846	Mg	Zn	Zn	Cd	Zr	Si	Ge	Ge	3.421	0.845	
Be	Ba	Sn	Sn	Al	Al	Ga	Ga	0.915	0.426	Mg	Ba	Ge	Ge	Al	Sc	Sc	Sc	2.460	0.422	Ba	Cd	Zr	Zr	Zr	Al	Al	Sc	2.953	0.390	Be	Ca	Sr	Sr	Sn	Sn	Hf	Hf	3.421	0.931		
Ba	Ba	Sn	Sn	Al	Al	Ga	In	0.917	-0.315	Sr	Sr	Hf	Hf	Al	Ga	Ga	Y	2.460	0.488	Ca	Zn	Sn	Zr	Y	Y	Y	Y	2.954	0.452	Be	Sr	Si	Ti	Sc	Sc	Sc	Sc	3.421	0.809		
Be	Ba	Ge	Ge	In	In	In	Sc	0.917	-0.041	Sr	Sr	Cd	Cd	Sn	Zr	Hf	Hf	2.460	0.492	Zn	Cd	Zr	Hf	Y	Y	Y	Y	2.954	0.392	Mg	Cd	Cd	Cd	Si	Ti	Ti	Hf	3.421	0.823		
Ba	Ba	Ge	Sn	Ga	Ga	Ga	Y	0.919	-0.085	Sr	Ba	Ba	Cd	Ge	Ge	Zr	Zr	2.461	0.094	Mg	Mg	Zn	Zn	Sn	Sn	Zr	Hf	2.954	0.616	Be	Be	Ca	Ba	Ge	Ge	Ge	Ti	3.422	0.871		
Mg	Sr	Sn	Sn	Ga	Ga	Ga	Sc	0.921	-0.342	Ba	Ba	Ti	Hf	Ga	Ga	Ga	In	2.461	-0.018	Sr	Sr	Zr	Zr	Al	Sc	Y	Y	2.954	0.840	Ca	Ca	Sr	Ba	Ge	Ge	Hf	Hf	3.422	0.779		
Sr	Sr	Sn	Sn	Al	Al	Ga	Y	0.922	0.088	Mg	Mg	Ba	Cd	Cd	Sn	Sn	Zr	2.461	-0.034	Mg	Sr	Si	Si	In	Sc	Sc	Sc	2.954	0.416	Be	Be	Sr	Sr	Sn	Sn	Zr	Hf	3.422	0.811		
Mg	Cd	Sn	Sn	In	In	In	Sc	0.923	-0.050	Ba	Ba	Si	Hf	Al	Al	Ga	Ga	2.461	0.116	Ca	Ba	Ba	Cd	Si	Si	Si	Hf	2.954	0.452	Be	Be	Sr	Cd	Si	Si	Si	Ge	3.422	0.831		
Sr	Cd	Ge	Ge	In	In	In	Sc	0.925	-0.317	Sr	Sr	Ge	Hf	Al	Al	Y	Y	2.461	-0.022	Sr	Zn	Ge	Ti	Al	Al	Al	Al	2.954	0.292	Sr	Sr	Sr	Ba	Si							

Mg	Ba	Ge	Sn	Ga	Ga	Ga	1.038	0.050	Sr	Sr	Ba	Cd	Sn	Sn	Sn	Ti	2.470	0.844	Cd	Cd	Si	Ge	Al	Sc	Sc	Sc	2.962	0.559	Mg	Ca	Ca	Ba	Sn	Sn	Zr	Zr	3.429	1.142	
Ca	Ca	Sn	Sn	Ga	Ga	In	Sc	-0.024	Ba	Ba	Si	Si	Al	In	Y	Y	2.470	0.940	Ca	Ca	Ti	Ti	Al	Ga	Ga	Sc	2.962	0.392	Be	Cd	Cd	Cd	Si	Zr	Hf	Hf	3.429	0.910	
Be	Ba	Sn	Sn	In	Y	Y	1.041	0.296	Ba	Ba	Cd	Cd	Ge	Ge	Ti	Ti	2.470	0.931	Ba	Ba	Ba	Zn	In	Ge	Ge	Sn	2.962	0.542	Mg	Mg	Ba	Zn	Ge	Zr	Zr	Zr	3.429	0.535	
Ca	Cd	Sn	Sn	Ga	Ga	Y	1.042	0.209	Sr	Ba	Cd	Cd	Si	Si	Si	Ti	2.470	0.601	Sr	Ba	Zn	Zn	Ti	Ti	Ti	Hf	2.963	0.656	Ca	Cd	Ti	Zr	Al	Al	Al	Al	3.429	0.685	
Ba	Cd	Sn	Ti	In	In	In	1.042	0.127	Ba	Cd	Cd	Cd	Ge	Ge	Zr	Hf	2.470	0.513	Sr	Sr	Zn	Zn	Ge	Zr	Zr	Hf	2.963	0.850	Mg	Mg	Sn	Zr	Al	Sc	Sc	Sc	3.429	0.661	
Mg	Zn	Sn	Sn	In	In	In	1.044	0.159	Ca	Cd	Cd	Cd	Si	Si	Ge	Hf	2.471	0.526	Mg	Sr	Cd	Cd	Si	Si	Si	Ge	2.963	0.398	Ca	Ba	Ba	Ba	Ge	Ti	Zr	Zr	3.429	0.870	
Ba	Cd	Sn	Sn	Al	Al	Ga	1.045	0.275	Cd	Cd	Zr	Zr	Si	Si	Ga	Ga	Y	2.471	0.611	Sr	Sr	Ba	Cd	Zn	Si	Si	Hf	2.963	0.285	Ca	Ca	Ba	Ba	Ti	Zr	Zr	Hf	3.429	1.098
Sr	Zn	Sn	Sn	In	In	Sc	1.045	0.185	Ca	Zn	Cd	Cd	Ge	Ge	Ge	Hf	2.471	0.504	Zn	Zn	Cd	Cd	Si	Si	Ge	Zr	Zr	2.963	0.647	Be	Be	Ca	Si	Ti	Ti	Hf	Hf	3.430	0.956
Mg	Zn	Sn	Sn	In	In	In	1.046	0.026	Ba	Ba	Zr	Zr	Al	Al	In	In	2.471	0.522	Mg	Ca	Sr	Sr	Si	Si	Sn	Sn	2.963	0.635	Be	Be	Be	Zn	Si	Ti	Ti	Hf	3.430	0.781	
Be	Ba	Ge	Sn	Ga	Ga	Ga	1.047	0.227	Ba	Ba	Ba	Cd	Ge	Ge	Sn	Hf	2.471	0.590	Zn	Cd	Zr	Zr	Al	Al	Al	In	2.963	0.806	Be	Be	Zn	Zn	Ti	Ti	Zr	Hf	3.430	1.138	
Be	Sr	Ge	Ge	In	In	Sc	1.048	0.038	Ca	Cd	Si	Si	Ga	Ga	Sc	2.472	0.576	Ca	Ca	Hf	Hf	Al	Al	Sc	Y	2.963	0.571	Be	Be	Ba	Ba	Si	Sn	Ti	Ti	3.430	0.976		
Cd	Cd	Si	Sn	In	In	In	Sc	1.048	0.104	Be	Zn	Sn	Sn	Sc	Sc	Y	2.472	0.577	Be	Be	Sn	Ti	Al	Ga	Y	Y	2.963	0.460	Ca	Ca	Ca	Zn	Sn	Zr	Zr	Hf	3.430	0.596	
Cd	Cd	Si	Ge	Al	In	In	In	1.051	0.219	Be	Sr	Sn	Hf	Y	Y	Y	2.472	0.364	Be	Ba	Ge	Ti	Al	Al	Al	Al	2.963	0.672	Be	Be	Cd	Cd	Si	Ge	Ti	Ti	3.430	0.738	
Ba	Ba	Sn	Sn	Al	Al	In	Sc	1.053	0.130	Ba	Ba	Zn	Zn	Cd	Ti	Hf	Hf	2.472	0.242	Be	Be	Ti	Zr	In	Y	Y	2.963	0.642	Ca	Sr	Sr	Sr	Si	Ge	Sn	Sn	3.430	0.758	
Be	Sr	Sn	Sn	Al	Ga	Ga	1.054	0.356	Ba	Cd	Cd	Cd	Si	Ti	Ti	Zr	2.472	0.283	Sr	Sr	Ba	Zn	Si	Si	Si	Sn	2.964	0.809	Be	Ca	Ba	Ba	Sn	Sn	Hf	Hf	3.430	0.618	
Ca	Cd	Sn	Sn	In	In	Sc	1.055	0.532	Be	Ba	Hf	Hf	Al	Y	Y	Y	2.472	0.472	Ba	Ba	Ti	Zr	Al	Y	Y	Y	2.964	0.604	Be	Be	Ti	Hf	Sc	Sc	Y	Y	3.430	0.771	
Be	Cd	Sn	Sn	In	In	Y	1.056	0.263	Ca	Ba	Ti	Ti	Ga	Ga	In	In	2.473	0.157	Mg	Cd	Ti	Ti	In	Y	Y	Y	2.964	0.492	Be	Be	Sr	Ba	Sn	Ti	Ti	Ti	3.430	0.973	
Sr	Cd	Sn	Zr	In	In	Y	1.057	0.241	Sr	Sr	Ti	Zr	Ga	Ga	Ga	Y	2.473	0.220	Ca	Ba	Si	Ge	Y	Y	Y	Y	2.964	1.000	Mg	Zn	Si	Si	Al	Al	Ga	Ga	3.430	1.574	
Sr	Sr	Si	Sn	Al	In	In	In	1.058	0.487	Be	Ca	Hf	Hf	In	In	In	Y	2.473	0.360	Mg	Sr	Sr	Cd	Si	Si	Ti	Ti	2.964	1.326	Be	Sr	Sr	Zn	Zr	Zr	Hf	Hf	3.430	1.627
Ba	Zn	Sn	Sn	Ga	Ga	Sc	1.059	0.206	Sr	Ba	Cd	Cd	Sn	Hf	Hf	Hf	2.473	0.130	Mg	Mg	Ba	Cd	Ge	Ge	Ge	Zr	2.964	1.536	Ca	Ca	Zn	Ge	Zr	Zr	Hf	Hf	3.430	1.549	
Cd	Cd	Ge	Ge	Ga	In	In	Y	1.059	0.221	Be	Ba	Sn	Hf	Sc	Sc	Sc	Sc	2.473	0.191	Mg	Ca	Sn	Zr	Y	Y	Y	Y	2.964	0.675	Be	Be	Mg	Sr	Ti	Ti	Ti	Hf	3.431	1.174
Ca	Ba	Sn	Sn	Ga	In	Y	1.060	0.479	Ca	Ba	Zn	Zn	Ge	Ge	Hf	Hf	2.473	0.440	Zn	Zn	Zr	Zr	Al	Al	In	Sc	2.964	0.472	Ca	Ba	Ba	Ba	Ge	Zr	Zr	Hf	3.431	1.452	
Sr	Sr	Sn	Sn	Al	Al	In	Sc	1.062	0.196	Sr	Ba	Cd	Cd	Sn	Sn	Ti	Ti	2.473	0.007	Be	Cd	Cd	Cd	Si	Sn	Hf	Hf	2.964	0.675	Sr	Sr	Ba	Ba	Si	Si	Zr	Zr	3.431	1.371
Cd	Cd	Sn	Sn	Al	Ga	Ga	Y	1.063	0.288	Ca	Ca	Ge	Hf	Al	Al	Ga	2.474	0.132	Mg	Mg	Mg	Cd	Si	Sn	Hf	Hf	2.964	0.804	Be	Zn	Cd	Cd	Si	Zr	Zr	Zr	3.431	1.046	
Ba	Cd	Ge	Ge	Ga	Ga	Ga	In	1.065	0.284	Sr	Cd	Cd	Cd	Sn	Ti	Ti	Hf	2.474	0.458	Zn	Cd	Cd	Cd	Sn	Ti	Hf	Hf	2.964	0.989	Mg	Mg	Ba	Zn	Si	Zr	Zr	Zr	3.431	1.460
Ca	Cd	Sn	Sn	Al	Ga	Ga	1.065	-0.036	Be	Be	Si	Sn	Ga	Ga	Y	Y	2.474	-0.012	Be	Cd	Ti	Ti	Al	Y	Y	Y	2.964	0.490	Mg	Cd	Cd	Cd	Si	Si	Ti	Zr	3.431	1.375	
Sr	Ba	Sn	Sn	Al	Al	Ga	1.066	0.277	Cd	Cd	Si	Ti	Ga	Ga	Ga	Y	2.474	0.123	Sr	Sr	Sr	Zn	Si	Si	Sn	Zr	2.965	0.342	Mg	Ca	Ca	Ba	Sn	Sn	Sn	Hf	3.431	1.269	
Ca	Sr	Ge	Ge	In	In	In	Sc	1.066	0.273	Mg	Cd	Ge	Zr	Ga	Ga	Ga	Y	2.474	0.564	Mg	Ca	Hf	Hf	Ga	Ga	Ga	Y	2.965	0.768	Sr	Ba	Ba	Ba	Sn	Ti	Ti	Zr	3.431	1.491
Mg	Ba	Sn	Sn	Al	Al	Ga	1.067	-0.053	Sr	Sr	Si	Si	Al	In	Y	Y	2.474	0.370	Mg	Mg	Sr	Ba	Ge	Ge	Sn	Sn	2.965	0.771	Sr	Sr	Ba	Ba	Sn	Ti	Ti	Zr	3.431	1.296	
Sr	Sr	Sn	Sn	Ga	Ga	Sc	Y	1.067	0.482	Mg	Cd	Ti	Ti	Ga	Ga	In	In	2.474	0.396	Be	Ca	Zn	Sn	Sn	Sn	Zr	2.965	0.933	Sr	Sr	Ba	Ba	Ge	Sn	Hf	3.431	1.153		
Mg	Ca	Sn	Sn	Ga	Ga	Ga	Y	1.070	0.478	Mg	Zn	Zr	Hf	In	In	In	2.474	0.471	Ca	Ca	Ba	Cd	Zr	Zr	Hf	Hf	2.965	0.651	Mg	Mg	Mg	Ba	Sn	Zr	Zr	Hf	3.431	1.518	
Ba	Cd	Sn	Sn	Ga	Ga	Sc	Sc	1.070	-0.073	Ca	Ba	Ti	Ti	In	In	Sc	Sc	2.474	0.394	Mg	Mg	Zr	Hf	Al	In	In	In	2.966	0.507	Ca	Ca	Sr	Zn	Ti	Zr	Zr	Zr	3.432	1.301
Ba	Cd	Ge	Hf	In	In	In	In	1.071	0.359	Sr	Sr	Hf	Al	Al	Sc	Sc	Sc	2.474	0.408	Sr	Zn	Ge	Zr	Sc	Sc	Sc	2.965	0.791	Ca	Sr	Sr	Sn	Zr	Zr	Zr	Hf	3.432	0.926	
Ba	Zn	Sn	Sn	Al	Ga	Ga	1.072	0.533	Mg	Cd	Ge	Ge	Al	Al	Al	In	2.474	0.546	Ba	Ba	Ti	Zr	Sc	Sc	Sc	Y	2.965	0.776	Ca	Ca	Sr	Sr	Si	Sn	Sn	Hf	3.432	1.082	
Sr	Sr	Sn	Sn	Al	Al	Ga	Sc	1.073	0.350	Cd	Ca	Sr	Cd	Sn	Sn	Hf	2.474	0.274	Ca	Ba	Zr	Zr	Al	Al	Al	Ga	2.965	0.935	Mg	Mg	Ti	Ti	Ga	In	Sc	3.432	1.088		
Ba	Ba	Ge	Sn	Ga	Ga	Sc	1.074	0.235	Zn	Zn	Hf	Hf	Ga	Ga	Ga	Sc	2.475	0.365	Mg	Mg	Mg	Cd	Ge	Ge	Sn	Zr	2.965	0.682	Zn	Zn	Ti	Ti	Al	Sc	Sc	Y	3.432	1.282	
Ca	Ba	Ge	Ge	Al	In	In	In	1.075	0.487	Ca	Sr	Hf	Hf	In	In	Sc	Sc	2.475	0.563	Be	Mg	Sr	Sr	Si	Si	Sn	2.965	0.538	Sr	Sr	Sr	Ba	Sn	Ti	Ti	Hf	3.432	1.474	
Zn	Zn	Ge	Sn	In	In	In	Y	1.075	0.291	Ba	Ba	Sn	Zr	Al	Sc	Sc	Sc	2.475	0.254	Be	Be	Be	Cd	Ge	Ge	Zr	Hf	2.965	0.876	Be	Be	Mg	Cd	Sn	Ti	Ti	Ti	3.432	1.343
Zn	Zn	Ge	Ge	Ga	Ga	In	In	1.076	0.214	Sr	Cd	Ge	Hf	Al	Al	Al	Al	2.475	0.358	Ca	Ca	Ca	Ti	Ti	In	Sc	Sc	2.965	1.007	Ca	Ca	Ca	Sr	Ge	Sn	Zr	Zr	3.432	1.173
Mg	Cd	Sn	Sn	Al	Al	In	In	1.077	0.478	Be	Ba	Sn	Hf	Al	Al	Al	Al	2.475	0.521	Ca	Zn	Si	Si	Ge	Y	Y	Y	2.965	1.172	Be	Sr	Sr	Ba	Sn	Sn	Sn	Hf	3.432	1.498
Sr	Ba	Ge	Ge	Al	In	In	In	1.078	0.280	Cd	Cd	Si	Si	Al	Ga	Ga	Y	2.475	0.740	Sr	Sr	Ti	Hf	Al	Y	Y	Y	2.965	0.627	Be	Be	Mg	Sr	Ge	Ge	Ge	Zr	3.433	1.350
Ba	Ba	Sn	Sn	Ga	Ga	Sc	Y	1.078	0.269	Zn	Zn	Ti	Zr	Ga	Ga	In	In	2.476	0.677	Mg	Ca	Cd	Cd	Sn	Hf	Hf	Hf	2.966	0.425	Be	Zn	Cd	Cd	Ti	Ti	Ti	Zr	3.433	0.975
Zn	Cd	Ge	Ge	Ga	Ga	In	Y	1.079	0.272	Ca	Cd	Ge	Ge	Al	Al	Sc	2.476	0.588	Cd	Cd	Si	Hf	Al	Y	Y	Y	2.966	0.936	Be	Be	Ge	Ge	Al	Al	Ga	Y	3.433	1.123	
Ca	Cd	Ge	Ge	Ga	Ga	In	In	1.080	0.044	Ba	Sr	Hf	Hf	Al	Ga	Ga	Y	2.476	0.652	Mg	Sr	Ti	Ti	Al	Al	Ga	Ga	2.966	0.943	Sr	Ba	Ba	Ba	Si	Ge	Ge	Sn	3.433	1.167
Zn	Zn	Sn	Sn	Al	In	In	Y	1.081	0.256	Sr	Sr	Sr	Cd	Ge	Ge	Zr	Hf	2.476	0.646	Mg	Ba	Hf	Hf	Al	Al	Al	Ga	2.966	1.084	Be	Be	Zn	Zn	Sn	Ti	Ti	Hf	3.433	0.985
Mg	Cd	Sn	Sn	Ga	Ga	In	In	1.082	0.261	Ba	Zn	Cd	Cd	Zr	Hf	Hf	Hf	2.476	0.603	Be	Zn	Ge	Ge	In	Sc	Sc	Sc	2.966	0.756	Ba	Ba	Ba	Zn	Hf					

Ca	Ca	Ge	Sn	In	In	Y	Y	1.174	0.507	Ba	Ba	Ba	Cd	Ge	Ge	Sn	Zr	2.486	1.012	Zn	Zn	Hf	Hf	Al	Ga	Ga	Y	2.973	0.853	Ca	Ba	Ba	Ba	Si	Si	Ge	Sn	3.441	0.758	
Be	Ba	Sn	Hf	In	Al	In	In	1.174	0.662	Sr	Cd	Cd	Cd	Si	Ti	Hf	Hf	2.486	0.970	Mg	Mg	Ge	Ti	Ga	Ga	Ga	In	2.973	0.797	Ba	Be	Sn	Ti	Ga	Ga	Sc	Sc	3.441	0.858	
Cd	Cd	Ge	Ge	Al	In	In	Y	1.174	0.585	Mg	Ca	Cd	Cd	Sn	Sn	Ti	Ti	2.486	1.169	Mg	Zn	Sn	Zr	Al	Al	Al	Al	2.973	0.922	Mg	Ba	Sn	Zr	Al	Al	Al	Al	3.441	0.879	
Zn	Cd	Sn	Sn	Ga	Ga	Y	Y	1.175	0.472	Sr	Sr	Si	Si	Ga	Ga	Sc	Y	2.486	1.415	Be	Be	Sr	Sr	Ge	Ge	Sn	Zr	2.973	0.712	Be	Ba	Ba	Ba	Ge	Sn	Zr	Zr	3.441	0.731	
Mg	Ba	Sn	Sn	Al	Al	Al	Y	1.176	0.642	Ba	Ba	Si	Si	Hf	Ga	Ga	Y	2.487	1.315	Mg	Zn	Ti	Ti	Al	Al	In	In	2.973	0.539	Ca	Ca	Ba	Zn	Si	Ti	Ti	Ti	3.441	0.893	
Ba	Cd	Ge	Ti	In	Al	In	In	1.177	0.577	Sr	Zn	Zn	Cd	Ge	Ge	Ge	Ti	2.487	1.139	Be	Ca	Sn	Ti	Y	Y	Y	Y	2.973	0.869	Mg	Mg	Mg	Sr	Si	Si	Sn	Hf	3.441	0.935	
Cd	Cd	Si	Ge	Ge	Ga	In	In	1.178	0.464	Sr	Ca	Sn	Hf	Al	Al	Al	Ga	2.487	1.339	Zn	Zn	Sn	Hf	Al	Al	Al	Sc	2.973	0.795	Mg	Mg	Ba	Ba	Sn	Zr	Zr	Zr	3.442	0.748	
Ca	Ba	Sn	Sn	Ga	Ga	Y	Y	1.178	0.883	Ba	Ba	Hf	Hf	Ga	In	Sc	Sc	2.487	1.290	Sr	Ba	Zr	Zr	Al	Al	Al	Sc	2.973	0.917	Mg	Mg	Mg	Sr	Sn	Sn	Ti	Hf	3.442	0.835	
Ca	Ca	Si	Sn	Sn	Ga	In	In	1.179	0.791	Ca	Cd	Zr	Zr	Al	Al	In	In	2.488	1.132	Zn	Zn	Zn	Cd	Si	Ge	Hf	Hf	2.973	0.736	Be	Be	Ca	Zr	Al	Ti	Zr	Zr	3.442	0.886	
Zn	Zn	Sn	Sn	Ga	Ga	In	Y	1.181	0.536	Ba	Zn	Zn	Cd	Si	Hf	Hf	Hf	2.488	1.318	Be	Be	Ba	Zn	Ge	Hf	Hf	Hf	2.974	0.564	Ca	Ca	Sr	Sr	Si	Ge	Sn	Sn	3.442	0.868	
Ca	Ca	Ge	Sn	Sn	Ga	Ga	Y	1.181	0.813	Ba	Zn	Cd	Cd	Zr	Zr	Hf	Hf	2.488	1.282	Ca	Ca	Ge	Cd	Ti	Ti	Zr	2.974	0.928	Mg	Sr	Ba	Ba	Zn	Zr	Zr	Zr	3.442	0.838		
Zn	Zn	Sn	Sn	Ga	Ga	Y	Y	1.181	0.761	Ba	Cd	Cd	Cd	Si	Zr	Hf	Hf	2.488	0.864	Mg	Cd	Ge	Sc	Y	Y	Y	Y	2.974	0.846	Be	Ba	Ba	Ba	Sn	Sn	Ti	Hf	3.443	0.668	
Sr	Zn	Sn	Hf	In	Al	In	In	1.182	0.492	Ba	Zn	Zr	Zr	In	In	Sc	Sc	2.488	0.849	Sr	Ba	Hf	Hf	Sc	Sc	Y	Y	2.974	0.953	Mg	Mg	Hf	Hf	Al	Al	Ga	Y	3.443	0.500	
Ca	Cd	Sn	Hf	In	Al	In	In	1.183	0.795	Ca	Zn	Ge	Ge	Al	Al	Al	Y	2.488	0.804	Be	Ca	Ca	Zn	Sn	Sn	Hf	Hf	2.974	0.786	Ca	Ca	Ba	Ba	Si	Sn	Sn	Hf	3.443	0.145	
Ca	Ca	Ge	Ge	Ga	In	In	Y	1.184	0.753	Mg	Cd	Si	Hf	In	In	Y	Y	2.488	0.864	Sr	Ba	Zr	Hf	Y	Y	Y	Y	2.974	0.608	Ca	Cd	Zr	Hf	Sc	Sc	Sc	Sc	3.443	0.330	
Be	Ba	Sn	Ti	In	In	In	Y	1.185	0.483	Cd	Cd	Cd	Cd	Ge	Sn	Zr	Hf	2.488	0.840	Be	Be	Ge	Ge	Ga	Ga	In	Sc	2.974	0.400	Sr	Sr	Sr	Ba	Si	Ti	Zr	Zr	3.443	0.170	
Mg	Sr	Sn	Sn	Al	Al	Ga	Ga	1.186	0.648	Ca	Ca	Ge	Zr	Ga	Ga	Sc	Sc	2.489	0.793	Be	Ba	Cd	Cd	Si	Si	Si	Ge	2.974	1.007	Mg	Ba	Ba	Ba	Ge	Sn	Ti	Ti	3.443	0.321	
Be	Sr	Ge	Sn	Ga	Ga	Ga	Ga	1.187	0.629	Be	Ba	Si	Ti	Ga	Ga	Ga	Ga	2.489	0.843	Ba	Ba	Zr	Hf	Sc	Sc	Sc	Y	2.974	1.423	Be	Be	Sr	Sr	Si	Ti	Ti	Zr	3.444	0.359	
Mg	Ba	Ge	Ge	Ga	Ga	Ga	In	1.187	0.531	Mg	Sr	Hf	Hf	In	Y	Y	Y	2.489	0.838	Mg	Sr	Hf	Hf	Al	Al	Al	Al	2.975	0.365	Mg	Mg	Zn	Cd	Si	Si	Ge	Ge	3.444	0.204	
Be	Ba	Ge	Ge	Ga	Ga	Ga	In	1.187	0.635	Ba	Cd	Cd	Cd	Si	Hf	Hf	Hf	2.489	0.831	Be	Sr	Hf	Hf	Al	Al	Al	Sc	2.975	0.428	Ca	Ca	Sr	Sr	Sn	Zr	Zr	Hf	3.444	0.254	
Cd	Cd	Sn	Zr	Al	Al	In	In	1.188	0.618	Ba	Ba	Ti	Hf	Al	Al	In	In	2.489	0.663	Be	Mg	Sr	Cd	Ge	Ge	Ge	Ge	2.975	0.613	Be	Mg	Cd	Cd	Si	Si	Ge	Ge	3.444	0.584	
Cd	Cd	Si	Sn	Al	Al	In	In	1.188	0.514	Sr	Zn	Cd	Cd	Sn	Hf	Hf	Hf	2.489	0.563	Be	Mg	Mg	Sr	Si	Sn	Sn	Sn	2.976	1.159	Be	Be	Sr	Zn	Ge	Ti	Ti	Ti	3.444	0.318	
Ba	Ba	Si	Ge	In	Al	In	Y	1.188	0.695	Sr	Sr	Cd	Cd	Ge	Zr	Hf	Hf	2.489	0.613	Sr	Sr	Sr	Zn	Si	Sn	Ti	Ti	2.976	1.562	Be	Ca	Ba	Sn	Sn	Sn	Ti	Ti	3.444	0.444	
Sr	Ba	Ge	Sn	Al	Al	In	In	1.189	0.694	Ba	Ba	Zn	Cd	Si	Ti	Ti	Ti	2.489	0.697	Be	Be	Be	Zn	Sn	Sn	Ti	Hf	2.976	0.590	Mg	Cd	Ti	Ti	In	Sc	Sc	Sc	3.444	0.627	
Sr	Sr	Ge	Ge	Zr	In	In	Sc	1.190	0.531	Be	Be	Sn	Zn	Ga	Ga	In	In	2.489	0.486	Cd	Cd	Ti	Ti	Al	Sc	Y	Y	2.976	0.626	Ca	Ca	Sr	Si	Sn	Sn	Zr	Zr	3.444	0.349	
Sr	Cd	Ge	Zr	In	In	In	Sc	1.191	1.033	Ca	Ca	Si	Si	Si	Ga	Ga	In	2.490	0.489	Ca	Ca	Sr	Cd	Ti	Zr	Zr	Zr	2.976	0.268	Ca	Cd	Si	Si	Al	Sc	Sc	Sc	3.444	0.150	
Ca	Sr	Sn	Sn	Ga	Ga	Y	Y	1.191	0.939	Ca	Ca	Sr	Cd	Sn	Sn	Zr	Zr	2.490	0.805	Ba	Cd	Ti	Hf	Al	Al	Al	Al	2.976	0.634	Sr	Sr	Ba	Ba	Ge	Sn	Sn	Hf	3.444	0.048	
Mg	Ca	Sn	Sn	Al	Al	In	In	1.192	0.794	Sr	Zn	Zn	Zn	Sn	Sn	Ti	Zr	2.490	0.757	Be	Be	Ba	Zn	Sn	Hf	Hf	Hf	2.977	0.987	Ca	Ca	Sr	Ba	Ge	Ge	Zr	Zr	3.444	0.047	
Zn	Zn	Sn	Sn	Ga	In	In	Sc	1.193	0.957	Zn	Zn	Zr	Zr	Al	Ga	In	In	2.490	0.653	Be	Be	Si	Sn	Ga	Ga	Ga	Y	2.977	0.317	Be	Be	Ca	Sr	Si	Hf	Hf	Hf	3.444	0.357	
Ca	Zn	Sn	Sn	Ga	Ga	Y	Y	1.196	0.913	Ca	Cd	Ti	Zr	Al	Al	In	In	2.490	0.809	Sr	Ba	Zn	Zn	Ti	Ti	Ti	Ti	2.977	0.379	Sr	Sr	Sr	Ba	Si	Sn	Sn	Zr	3.444	0.679	
Ca	Ca	Si	Sn	In	In	In	Sc	1.196	0.755	Ca	Ca	Zn	Zn	Si	Ge	Ge	Sn	2.490	0.682	Ba	Zn	Si	Ge	Sc	Sc	Sc	2.977	0.380	Mg	Be	Ba	Ba	Si	Si	Ge	Sn	3.445	0.559		
Cd	Cd	Ge	Sn	Al	Ga	Ga	Ga	1.196	0.937	Sr	Sr	Ge	Ge	Al	Sc	Y	Y	2.491	0.606	Zn	Zn	Zn	Cd	Ge	Sn	Ti	Ti	2.977	0.621	Sr	Sr	Ba	Ba	Si	Zr	Zr	Hf	3.445	0.533	
Ca	Ba	Sn	Sn	Al	Al	Al	Y	1.196	0.905	Zn	Cd	Si	Si	Ga	Ga	Y	Y	2.491	0.808	Mg	Mg	Mg	Zn	Zn	Ge	Ge	Sn	Hf	2.977	0.929	Mg	Cd	Si	Ge	Al	Al	Al	Al	3.445	0.714
Ca	Ba	Sn	Sn	Al	Al	Al	In	1.197	0.746	Ba	Ba	Zn	Zr	Zr	Ga	Ga	Y	2.491	0.663	Be	Ca	Si	Sn	Al	Al	Al	Al	2.977	0.452	Mg	Mg	Sr	Zn	Ge	Ge	Ge	Zr	3.445	0.575	
Ba	Ba	Ge	Ge	Ga	In	In	Sc	1.198	0.777	Mg	Sr	Hf	Hf	Ga	Ga	In	In	2.491	0.596	Zn	Zn	Ti	Ti	Hf	Ga	Ga	Y	2.977	0.493	Zn	Cd	Si	Hf	Sc	Sc	Sc	Sc	3.445	0.262	
Mg	Cd	Si	Ge	In	In	In	In	1.199	0.768	Mg	Mg	Sn	Hf	Al	Al	In	In	2.491	0.832	Mg	Ba	Ti	Ti	Al	Al	Al	Al	2.977	0.406	Mg	Ca	Ba	Ge	Ge	Ge	Ge	Sn	3.445	0.166	
Be	Cd	Ge	Ge	Ga	In	In	In	1.199	0.792	Ca	Ca	Sn	Zr	In	Y	Y	Y	2.491	0.719	Ca	Ca	Ti	Zr	Al	Al	Ga	Ga	2.978	0.629	Be	Ba	Zn	Ti	Ti	Sc	Sc	Y	Y	3.445	0.276
Ca	Ca	Si	Sn	Al	Al	Ga	Y	1.199	0.761	Ba	Zn	Zn	Zn	Si	Ge	Zr	Zr	2.491	0.679	Ca	Ca	Ge	Hf	Al	Sc	Sc	Sc	2.978	0.930	Be	Ba	Zn	Zn	Si	Si	Ge	Sn	3.445	0.324	
Cd	Cd	Si	Ge	In	In	In	Y	1.199	0.757	Sr	Cd	Ti	Zr	Ga	Ga	Ga	Ga	2.491	0.942	Ca	Ca	Ba	Cd	Si	Ti	Ti	Ti	2.978	0.480	Mg	Mg	Mg	Sr	Ge	Sn	Hf	Hf	3.446	0.247	
Ba	Cd	Sn	Sn	Al	Al	Al	In	1.201	0.775	Be	Ba	Zn	Zr	In	In	Y	Y	2.491	1.011	Cd	Cd	Zr	Hf	Al	Al	Sc	Sc	2.978	0.517	Be	Mg	Mg	Ba	Sn	Sn	Hf	Hf	3.446	0.538	
Be	Ca	Sn	Sn	In	In	Sc	Sc	1.201	0.816	Zn	Zn	Hf	Hf	Al	In	In	Y	2.491	0.884	Be	Sr	Sr	Zn	Ge	Ge	Hf	Hf	2.978	0.747	Ca	Ca	Ba	Ba	Ge	Ge	Zr	Hf	3.446	1.171	
Sr	Ba	Sn	Sn	Ga	Ga	Y	Y	1.201	0.816	Ba	Ba	Ge	Ge	Sc	Sc	Y	Y	2.491	0.930	Be	Mg	Zr	Zr	Ga	Ga	Y	Y	2.978	1.305	Be	Sr	Sr	Zn	Zr	Zr	Zr	Hf	3.446	1.006	
Ba	Cd	Ge	Ge	Ga	Ga	Ga	Y	1.203	0.779	Ba	Ba	Zn	Ge	Ge	Sn	Ti	Ti	2.491	0.924	Mg	Mg	Zr	Hf	In	In	In	Sc	2.978	1.704	Mg	Ca	Ba	Sn	Sn	Sn	Ti	Ti	3.446	0.822	
Be	Zn	Sn	Sn	Al	In	In	In	1.203	0.896	Sr	Sr	Ti	Zr	Ga	Ga	In	In	2.491	0.853	Be	Be	Be	Sr	Sn	Sn	Ti	Hf	2.979	0.691	Be	Ba	Ba	Ba	Sn	Zr	Hf	Hf	3.446	0.470	
Ba	Zn	Ge	Sn	Ga	Ga	Ga	Ga	1.205	0.884	Cd	Cd	Si	Ti	Al	Ga	Ga	Ga	2.491	0.926	Ca	Zn	Ge	Hf	Al	Al	Al	Al	2.979	0.696	Be	Ca	Cd	Cd	Si	Si	Si	Hf	3.446	0.661	
Ba	Ba	Sn	Sn	Al	Al	In</																																		

Ca	Cd	Sn	Ti	In	In	In	In	1.273	0.505	Ca	Sr	Cd	Cd	Si	Si	Ti	Ti	2.502	0.368	Sr	Sr	Ti	Ti	Ga	Sc	Y	Y	2.988	1.072	Mg	Mg	Zn	Zn	Si	Sn	Ti	Ti	3.456	0.498	
Zn	Zn	Ge	Sn	In	In	In	Sc	1.273	0.480	Ca	Ca	Hf	Hf	Ga	In	Y	Y	2.502	0.478	Be	Be	Be	Cd	Si	Ge	Ge	Sn	2.988	0.555	Be	Be	Ti	Zr	In	In	Sc	Sc	3.457	0.406	
Ca	Sr	Sn	Sn	Al	Al	Al	Y	1.274	0.216	Ca	Cd	Ge	Ge	Sc	Sc	Y	Y	2.502	0.393	Be	Ba	Si	Si	Al	Sc	Sc	Y	2.988	0.544	Ca	Ca	Ba	Si	Sn	Sn	Zr	Zr	3.457	0.575	
Ba	Ba	Sn	Hf	In	In	In	Y	1.275	0.546	Ca	Zn	Cd	Cd	Ge	Ge	Ge	Zr	2.502	0.403	Zn	Cd	Ge	Zr	Y	Y	Y	Y	2.988	0.572	Be	Ba	Zn	Cd	Zr	Zr	Hf	Hf	3.457	0.843	
Ba	Ba	Zn	Ge	Zr	In	In	In	1.275	0.477	Mg	Cd	Si	Si	Al	Al	In	In	2.502	0.542	Mg	Sr	Ge	Zr	Y	Y	Y	Y	2.988	0.792	Be	Be	Mg	Zn	Ti	Zr	Hf	Hf	3.457	0.669	
Ba	Ba	Si	Sn	Ga	Al	In	In	1.275	0.206	Mg	Ba	Ge	Ge	Sc	Sc	Y	Y	2.502	0.306	Be	Be	Be	Cd	Si	Ge	Hf	Hf	2.988	1.070	Zn	Zn	Zn	Zn	Ge	Ti	Zr	Hf	3.457	0.624	
Ca	Ca	Si	Sn	Al	In	In	In	1.276	0.549	Ba	Ba	Si	Zr	Ga	Ga	Ga	Ga	2.503	0.398	Be	Be	Ca	Cd	Ti	Ti	Ti	Hf	2.988	0.582	Ba	Ba	Ba	Ba	Si	Ti	Zr	Hf	3.457	0.516	
Ca	Sr	Sn	Ga	Ga	Ga	Sc	Sc	1.278	0.476	Be	Ba	Ba	Cd	Ge	Zr	Zr	Zr	2.503	0.554	Mg	Mg	Sn	Hf	Al	Y	Y	Y	2.988	0.567	Be	Be	Be	Ca	Ti	Ti	Zr	Hf	3.457	0.493	
Mg	Ba	Sn	Ti	In	In	In	In	1.278	0.204	Ba	Ba	Hf	Hf	Al	In	Sc	Sc	2.503	0.290	Be	Be	Sr	Sr	Si	Si	Ge	Sn	2.988	0.615	Ca	Zn	Zr	Zr	Sc	Sc	Sc	Sc	Y	3.457	0.463
Ca	Ba	Ge	Ge	Ga	Ga	Ga	In	1.278	0.690	Sr	Cd	Cd	Cd	Ge	Ti	Zr	Zr	2.503	0.398	Be	Be	Ba	Cd	Si	Si	Hf	2.988	0.977	Mg	Mg	Si	Hf	Al	Y	Y	Y	Y	3.457	0.653	
Be	Cd	Si	Ge	Al	In	Ga	In	1.279	0.593	Sr	Sr	Hf	Hf	Al	In	Y	Y	2.503	0.557	Ca	Zn	Zr	Hf	Ga	Ga	Ga	Ga	2.988	1.279	Mg	Mg	Mg	Cd	Ti	Ti	Zr	Hf	3.457	0.483	
Cd	Cd	Ge	Ge	Al	Ga	Ga	In	1.279	0.183	Ba	Ba	Zr	Zr	Al	Ga	Ga	In	2.503	0.793	Be	Be	Sn	Sn	Al	Ga	Ga	Sc	2.988	0.529	Ca	Sr	Sr	Sr	Ti	Ti	Zr	Hf	3.457	0.460	
Zn	Cd	Ge	Ge	In	In	In	Sc	1.280	0.698	Cd	Cd	Zr	Hf	In	Y	Y	Y	2.503	0.701	Ca	Sr	Sr	Cd	Si	Si	Ge	Ge	2.989	0.482	Zr	Sr	Ba	Ba	Si	Sn	Sn	Zr	3.457	0.550	
Ca	Sr	Ge	Ge	Ga	Ga	Ga	In	1.281	0.590	Sr	Sr	Ge	Hf	In	Sc	Sc	Sc	2.504	0.600	Be	Be	Be	Cd	Cd	Si	Ge	Ge	2.989	0.684	Zn	Cd	Ti	Ti	Al	Sc	Sc	Sc	3.458	0.681	
Ba	Cd	Ge	Ge	In	In	In	Sc	1.282	0.175	Sr	Sr	Sr	Cd	Ge	Ge	Sn	Hf	2.504	0.721	Mg	Zn	Cd	Cd	Cd	Sn	Ti	Ti	2.989	0.921	Be	Be	Zn	Zn	Ge	Sn	Ti	Ti	3.458	0.617	
Zn	Zn	Sn	Sn	Al	In	In	Sc	1.282	0.921	Ca	Ca	Zn	Cd	Si	Ge	Ge	Ge	2.504	0.704	Zn	Zn	Cd	Cd	Si	Ge	Ge	Ti	2.989	1.181	Ca	Sr	Sr	Ba	Zr	Hf	Hf	Hf	3.458	0.702	
Cd	Cd	Ge	Ge	Ga	Ga	In	Y	1.282	0.906	Mg	Mg	Ge	Ge	Al	Al	In	Y	2.504	0.608	Mg	Mg	Mg	Cd	Cd	Ge	Sn	Zr	Zr	2.989	0.628	Sr	Ba	Ba	Ba	Ge	Sn	Ti	Ti	3.458	0.684
Sr	Sr	Sn	Sn	Al	Ga	Y	Y	1.283	0.265	Zn	Zn	Sn	Hf	Ga	Ga	Sc	Sc	2.505	0.705	Ca	Sr	Hf	Hf	Al	Al	Sc	Sc	2.989	0.568	Be	Ba	Ba	Ba	Ge	Sn	Ti	Ti	3.458	0.609	
Ba	Ba	Ge	Ge	Al	Ga	Ga	Y	1.284	0.550	Be	Zn	Hf	Hf	Ga	In	In	In	2.505	0.704	Sr	Cd	Hf	Hf	Al	Al	Al	Sc	2.989	0.704	Be	Be	Ca	Sr	Ge	Zr	Zr	Zr	3.458	0.625	
Mg	Ca	Sn	Sn	Ga	Ga	Ga	Sc	1.285	0.530	Sr	Sr	Si	Hf	Al	Al	Al	Y	2.505	0.376	Zn	Cd	Ti	Ti	Al	Y	Y	Y	2.990	0.922	Mg	Mg	Ti	Ti	Ga	In	Sc	Sc	3.458	0.510	
Sr	Cd	Ge	Ge	Ga	Ga	Ga	Y	1.285	0.325	Sr	Sr	Zr	Zr	Ga	Ga	In	Y	2.505	0.284	Be	Sr	Si	Ge	Sc	Sc	Sc	Sc	2.990	1.175	Ca	Sr	Zn	Zn	Zr	Zr	Hf	Hf	3.458	0.510	
Sr	Zn	Ge	Sn	Ga	Ga	Ga	Ga	1.285	0.574	Ba	Ba	Ti	Zr	Ga	Ga	In	Y	2.505	0.308	Be	Ba	Ba	Zn	Si	Zr	Zr	Zr	2.990	0.651	Be	Cd	Si	Ge	Sc	Sc	Sc	Sc	3.459	0.532	
Ca	Ca	Ge	Ge	Al	In	In	Y	1.289	0.523	Ca	Ca	Zr	Zr	Al	In	In	Y	2.505	0.389	Be	Ba	Cd	Ti	Sc	Sc	Sc	Sc	2.990	0.588	Mg	Ba	Ba	Ba	Ge	Sn	Sn	Ti	3.459	0.658	
Cd	Cd	Sn	Hf	Ga	Ga	Ga	In	1.292	0.307	Be	Cd	Cd	Ti	Ga	Ga	Ga	Y	2.505	0.277	Be	Cd	Cd	Cd	Si	Si	Sn	Zr	2.990	0.546	Be	Be	Sn	Zr	Sc	Sc	Sc	Sc	Y	3.459	0.608
Be	Sr	Sn	Ti	In	In	In	In	1.292	0.574	Mg	Ba	Zn	Zn	Sn	Sn	Sn	Hf	2.505	0.306	Ca	Ca	Si	Hf	Al	Al	Al	Sc	2.990	0.728	Be	Ca	Sr	Zn	Si	Si	Si	Zr	3.459	0.670	
Ba	Ba	Zn	Ge	Ge	Ga	Ga	Ga	1.292	0.520	Be	Be	Zn	Zn	Ge	Ge	Sn	Sc	2.505	0.371	Ca	Ca	Ba	Cd	Zr	Hf	Hf	Hf	2.990	0.965	Ca	Ca	Sr	Ba	Ti	Hf	Hf	Hf	3.459	0.653	
Mg	Sr	Ge	Ge	Ga	Ga	Ga	In	1.293	0.303	Zn	Zn	Zr	Hf	Al	Al	In	In	2.505	0.356	Ca	Ca	Si	Ti	Ga	Ga	Sc	Sc	2.990	0.517	Sr	Sr	Sr	Ba	Si	Zr	Zr	Hf	3.459	0.584	
Zn	Zn	Sn	Sn	Al	Ga	Ga	In	1.295	0.699	Sr	Sr	Hf	Hf	Al	Al	Ga	In	2.505	0.359	Be	Mg	Ge	Ge	Ga	Ga	Sc	Sc	2.990	0.479	Be	Ba	Ba	Ba	Sn	Zr	Zr	Hf	3.460	0.615	
Zn	Zn	Ge	Sn	In	In	Y	Y	1.296	0.614	Be	Cd	Sn	Al	Al	Al	Sc	2.506	0.589	Sr	Zn	Hf	Hf	Al	Al	Sc	Sc	2.990	0.566	Be	Be	Ba	Zn	Ti	Ti	Ti	Ti	3.460	0.504		
Cd	Cd	Sn	Sn	Al	Al	Ga	Y	1.297	0.269	Ba	Ba	Ge	Ti	Al	Al	Al	Ga	2.506	0.458	Mg	Mg	Ge	Hf	Al	Al	Sc	Sc	2.990	0.729	Be	Be	Ge	Ti	Ga	Ga	Ga	In	3.460	0.473	
Sr	Ba	Sn	Sn	Al	Al	Al	Sc	1.297	0.704	Ca	Ca	Zn	Ti	Ga	Ga	In	Y	2.506	0.501	Be	Be	Be	Cd	Sn	Ti	Ti	Hf	2.990	0.960	Be	Be	Ca	Sr	Si	Zr	Zr	Zr	3.460	0.598	
Sr	Zn	Ge	Hf	In	Ga	In	Y	1.297	0.610	Ba	Ba	Si	Si	Al	In	Sc	Sc	2.506	0.497	Be	Be	Si	Hf	Al	In	In	In	2.990	0.540	Ca	Zn	Zr	Zr	Al	Al	Al	Ga	3.460	0.504	
Zn	Zn	Sn	Sn	In	In	Sc	Y	1.299	0.259	Ba	Cd	Cd	Cd	Ti	Zr	Zr	Hf	2.506	0.380	Cd	Cd	Ti	Ti	Hf	Sc	Sc	Y	Y	2.990	0.498	Be	Be	Ge	Sn	Al	Al	Al	Y	3.460	0.585
Ba	Ba	Sn	Sn	Al	Al	Al	Sc	1.299	0.922	Mg	Mg	Ge	Ge	Al	Ga	Y	Y	2.506	0.450	Sr	Sr	Zn	Zn	Si	Zr	Hf	Hf	2.991	0.617	Ca	Ca	Sr	Sr	Ti	Ti	Zr	Hf	3.460	0.853	
Mg	Sr	Sn	Sn	Al	Al	Al	In	1.300	0.910	Sr	Sr	Ge	Zr	Hf	Ga	Ga	In	2.506	0.559	Be	Ba	Zn	Zn	Ge	Ge	Zr	Zr	2.991	0.754	Mg	Mg	Mg	Sr	Sn	Sn	Ti	Ti	3.460	0.680	
Mg	Ba	Sn	Zr	In	In	In	In	1.300	0.333	Be	Cd	Ge	Ge	Al	Y	Y	Y	2.506	0.385	Zn	Zn	Cd	Cd	Si	Si	Ge	Hf	2.991	0.951	Ca	Ca	Ca	Ba	Ti	Ti	Zr	Hf	3.460	0.642	
Be	Ba	Sn	Sn	Ga	Ga	Ga	In	1.302	0.731	Be	Mg	Ca	Zn	Sn	Sn	Sn	Y	2.507	0.452	Be	Ca	Sn	Zr	Sc	Sc	Sc	Sc	2.991	0.566	Ca	Cd	Ti	Ti	Sc	Y	Y	Y	3.460	0.543	
Sr	Zn	Sn	Ti	In	In	In	In	1.303	0.652	Ba	Cd	Si	Si	Al	Al	Al	In	2.507	0.614	Mg	Mg	Si	Si	Al	Ga	In	In	2.991	0.508	Ba	Ba	Ba	Ba	Si	Sn	Ti	Ti	3.461	0.514	
Mg	Ca	Sn	Sn	Ga	Ga	Y	Y	1.303	0.582	Be	Sr	Si	Sn	Al	Al	Al	Al	2.507	0.278	Be	Be	Mg	Sr	Sn	Sn	Sn	Ti	2.991	0.771	Be	Ba	Ba	Zn	Zn	Ge	Ti	Ti	3.461	0.490	
Sr	Sr	Ge	Ge	Al	Ga	Ga	In	1.304	0.735	Mg	Sr	Cd	Cd	Si	Ge	Ge	Ge	2.507	0.412	Ca	Ca	Zr	Hf	Ga	Ga	Sc	Sc	2.991	1.055	Ca	Ca	Sr	Sr	Sn	Sn	Ti	Hf	3.461	0.676	
Be	Ca	Sn	Sn	Ga	Ga	Y	Y	1.305	0.647	Ba	Ba	Sn	Hf	Al	Y	Y	Y	2.507	0.627	Ca	Ca	Zr	Hf	Al	Ga	Ga	Sc	2.991	1.234	Ca	Cd	Ti	Hf	Sc	Sc	Sc	Sc	3.461	0.501	
Ba	Ba	Sn	Sn	Al	Ga	Y	Y	1.308	0.573	Mg	Ba	Sn	Zr	Al	Al	Al	Al	2.507	0.260	Sr	Ba	Zn	Zn	Si	Ti	Ti	Ti	2.991	0.457	Mg	Mg	Zn	Zn	Ge	Ge	Ti	Hf	3.461	0.485	
Cd	Cd	Ge	Sn	In	In	Sc	Sc	1.308	0.934	Ca	Ca	Si	Hf	Ga	Ga	Ga	In	2.507	0.406	Mg	Zn	Cd	Cd	Ge	Ge	Ge	Hf	2.992	0.288	Sr	Ba	Ba	Si	Si	Ge	Sn	Ti	3.461	0.574	
Cd	Cd	Ge	Sn	Ga	Ga	Y	Y	1.308	0.923	Be	Ca	Zn	Zr	In	Y	Y	Y	2.507	0.792	Mg	Zn	Si	Si	Ga	Ga	Ga	Y	2.992	0.942	Be	Be	Zn	Zn	Si	Ti	Zr	Zr	3.462	0.697	
Ca	Cd	Sn	Sn	Al	Al	Ga	Ga	1.310	0.641	Zn	Zn	Sn	Zr	Al	Al	Ga	Ga	2.508	0.608	Ca	Ca	Ba	Zn	Sn	Sn	Sn	Ti	2.992	1.167	Mg	Mg	Sr	Cd	Si	Si	Ti	Ti	3.462	0.643	
Ba	Ba	Ge</																																						

Sr	Sr	Si	Sn	In	In	Y	Y	1.370	1.284	Sr	Cd	Hf	Hf	Al	Ga	Ga	2.519	0.689	Ca	Ca	Cu	Zn	Si	Sn	Hf	Hf	2.998	0.514	Mg	Sr	Ba	Zn	Hf	Hf	Hf	3.473	1.260		
Zn	Cd	Sn	Sn	Al	Al	Ga	Ga	1.371	1.051	Sr	Cd	Zn	Zn	Si	Ge	Ge	2.519	0.313	Be	Be	Ba	Cd	Sn	Ti	Ti	Ti	2.998	0.547	Ca	Ca	Ba	Ba	Ge	Sn	Ti	3.473	1.092		
Mg	Ca	Ge	Ge	Al	In	In	In	1.372	0.962	Cd	Ba	Cd	Ge	Al	Al	Sc	Y	2.519	0.476	Be	Cd	Hf	Hf	Al	Al	Ga	2.998	0.752	Be	Ca	Zr	Zr	Al	Al	Ga	3.473	1.084		
Sr	Sr	Ge	Sn	Al	Al	Ga	Ga	1.373	1.025	Ca	Zn	Hf	Hf	Ga	In	In	2.519	0.695	Zn	Zn	Ti	Hf	Al	Y	Y	Y	2.998	1.046	Mg	Mg	Mg	Cd	Si	Si	Ge	3.473	1.244		
Ba	Zn	Ge	Ge	Ga	Ga	Y	Y	1.375	0.764	Sr	Cd	Ti	Ti	Al	Ga	Ga	2.519	0.294	Be	Be	Be	Ba	Ti	Zr	Zr	Hf	2.999	0.604	Ca	Ba	Ba	Ba	Sn	Ti	Ti	Zr	3.473	1.081	
Ca	Cd	Ge	In	In	In	Y	Y	1.376	0.934	Cd	Cd	Sn	Hf	Al	Al	Al	2.519	0.471	Sr	Ba	Zn	Zn	Si	Zr	Zr	Zr	2.999	0.617	Mg	Mg	Mg	Cd	Ge	Ti	Ti	Hf	3.473	1.108	
Ca	Cd	Ge	Zr	In	In	In	In	1.376	1.008	Be	Sr	Ge	Ge	Al	Sc	Sc	2.519	0.821	Be	Cd	Cd	Cd	Si	Sn	Zr	Zr	2.999	0.572	Be	Cd	Ti	Hf	Sc	Sc	Sc	Sc	3.473	1.457	
Mg	Zn	Si	Sn	Ga	Ga	In	In	1.376	0.742	Be	Ca	Ge	Ge	Al	Y	Y	2.519	0.604	Ca	Ba	Zr	Zr	Al	Al	Sc	Sc	2.999	0.760	Ca	Ba	Ba	Ba	Sn	Ti	Ti	Hf	3.473	1.209	
Zn	Sr	Sn	Zr	In	In	In	In	1.376	1.094	Mg	Mg	Mg	Cd	Sn	Sn	Sn	2.519	0.669	Sr	Ba	Zn	Zn	Si	Hf	Hf	Hf	2.999	1.048	Ca	Ca	Ba	Ba	Ge	Ge	Sn	Zr	3.473	1.179	
Mg	Sr	Ge	Ge	Ga	Ga	Y	Y	1.377	1.101	Be	Ca	Ti	Ti	Al	In	In	2.519	0.773	Mg	Ba	Cd	Cd	Si	Si	Zr	2.999	0.631	Mg	Mg	Ca	Sr	Ge	Ge	Ge	Sn	3.474	1.456		
Cd	Cd	Sn	Ti	Ga	In	In	In	1.377	0.653	Zn	Zn	Ti	Hf	Al	In	In	2.519	0.706	Ba	Cd	Zr	Zr	Ga	Sc	Sc	Sc	2.999	0.639	Be	Ca	Si	Hf	Sc	Sc	Sc	Sc	3.474	1.194	
Mg	Cd	Sn	Sn	In	In	Sc	Sc	1.378	1.136	Mg	Ba	Si	Si	Ga	Ga	Y	2.520	0.706	Mg	Ca	Hf	Hf	Al	Y	Y	Y	2.999	0.912	Mg	Zn	Zr	Zr	Ga	Ga	Sc	3.474	0.827		
Be	Ba	Ge	Ti	In	In	Ga	In	1.379	1.378	Be	Sr	Zr	Zr	Al	Al	In	2.520	0.793	Be	Sr	Sr	Zn	Ge	Ge	Zr	Zr	2.999	1.416	Mg	Mg	Mg	Sr	Si	Ge	Ge	Sn	3.474	0.795	
Mg	Ca	Sn	Sn	Al	Ga	Ga	Ga	1.380	1.230	Ca	Ca	Zn	Zn	Si	Sn	Sn	2.520	0.590	Zn	Zn	Hf	Hf	Al	In	Sc	Sc	2.999	1.801	Be	Zn	Zn	Cd	Zr	Zr	Hf	3.474	0.872		
Zn	Cd	Ge	Hf	In	In	In	In	1.381	0.918	Ca	Ba	Zn	Zn	Sn	Sn	Ti	2.520	0.684	Ba	Ba	Ba	Zn	Si	Ti	Zr	Zr	2.999	0.859	Ca	Ca	Sr	Zn	Zr	Zr	Hf	Hf	3.474	1.187	
Sr	Ba	Sn	Hf	In	In	In	In	1.381	1.308	Cd	Cd	Ti	Ti	Al	Al	In	Y	2.520	0.797	Ca	Zn	Hf	Hf	Ga	Ga	Sc	2.999	0.842	Mg	Mg	Ge	Hf	Sc	Sc	Sc	Y	3.474	1.526	
Mg	Ba	Ge	Ge	In	In	Sc	Sc	1.382	1.146	Sr	Sr	Sr	Cd	Ge	Ge	Sn	Zr	2.520	0.568	Be	Ba	Cd	Cd	Si	Hf	Hf	Hf	3.000	0.556	Sr	Sr	Sr	Sr	Ge	Sn	Ti	Hf	3.474	1.430
Mg	Cd	Sn	Sn	Ga	Ga	Ga	Y	1.382	0.880	Mg	Mg	Mg	Sr	Cd	Ge	Sn	Zr	2.520	0.680	Sr	Zn	Zn	Si	Al	Al	Al	Y	3.000	0.893	Be	Be	Mg	Zn	Ti	Zr	Zr	Zr	3.475	1.247
Be	Sr	Sn	In	In	Sc	Sc	Sc	1.385	1.294	Sr	Sr	Ge	Hf	In	Y	Y	Y	2.520	0.876	Mg	Mg	Sr	Sr	Si	Ge	Sn	Sn	3.000	1.226	Sr	Sr	Ba	Ba	Ge	Sn	Ti	Ti	3.475	1.403
Sr	Sr	Si	Ge	Al	In	In	In	1.385	1.130	Mg	Ca	Ge	Hf	Ga	Ga	Ga	2.520	1.123	Zn	Zn	Si	Hf	Al	Al	Al	Ga	Sn	3.000	0.560	Mg	Mg	Ge	Ti	Al	Y	Y	Y	3.475	1.517
Sr	Cd	Ge	Ge	Al	Ga	In	Ga	1.386	0.954	Ba	Ba	Hf	Hf	Al	Al	Ga	In	2.521	1.020	Cd	Cd	Ti	Hf	In	Sc	Sc	Sc	3.001	0.566	Be	Mg	Sr	Zn	Zr	Zr	Zr	Zr	3.475	0.918
Ba	Cd	Si	Hf	In	In	In	In	1.386	1.023	Ca	Zn	Zn	Zn	Ge	Ge	Sn	Hf	2.521	0.875	Ba	Zn	Ge	Ti	Y	Y	Y	Y	3.001	0.651	Mg	Mg	Ba	Cd	Si	Si	Si	Ge	3.475	0.890
Ca	Ba	Sn	Hf	In	In	Al	In	1.386	0.835	Mg	Ba	Cn	Zn	Sn	Sn	Sn	Zr	2.521	1.023	Be	Zn	Hf	Hf	In	In	Sc	Sc	3.001	0.872	Be	Sr	Si	Ti	Al	Al	Al	Al	3.475	1.086
Mg	Sr	Sn	Sn	Al	Al	Al	Y	1.387	0.924	Ca	Ca	Zr	Zn	Ge	Sn	Sn	2.521	1.006	Be	Cd	Hf	Hf	In	In	Sc	Sc	Sc	3.001	1.162	Be	Be	Sr	Ba	Si	Si	Si	Hf	3.475	0.977
Be	Ba	Sn	Sn	Ga	Sc	Sc	Sc	1.387	1.006	Zn	Zn	Sn	Sn	Al	Al	In	2.521	0.876	Cd	Cd	Ti	Zr	Al	Ga	Sc	Sc	3.001	0.673	Be	Be	Be	Ca	Ge	Ti	Zr	Zr	3.475	0.968	
Zn	Cd	Sn	Sn	Ga	Ga	Sc	Sc	1.389	0.813	Ba	Ba	Zn	Zn	Si	Si	Ge	Hf	2.521	1.002	Mg	Cd	Sn	Zr	Y	Y	Y	Y	3.001	0.658	Mg	Ba	Zn	Zn	Ti	Ti	Zr	Zr	3.476	1.319
Zn	Zn	Sn	Sn	Ga	Ga	In	Sc	1.390	1.083	Ca	Sr	Sr	Zn	Ge	Ge	Sn	Sn	2.521	1.003	Ca	Ca	Ge	Zr	Al	Y	Y	Y	3.001	0.674	Be	Zn	Zn	Cd	Ti	Ti	Ti	Hf	3.476	1.029
Ca	Ba	Sn	Sn	Al	Al	Al	Ga	1.391	1.091	Ca	Ba	Si	Sn	Sc	Sc	Sc	Sc	2.521	0.626	Be	Mg	Zn	Zn	Sn	Sn	Hf	Hf	3.001	0.879	Be	Mg	Hf	Hf	Ga	Ga	Y	3.476	0.787	
Ca	Ca	Sn	Sn	Al	Al	Al	Ga	1.392	0.712	Mg	Cd	Zr	Zr	Ga	Ga	In	In	2.521	0.550	Cd	Cd	Si	Si	Ga	Sc	Sc	Y	3.001	1.162	Mg	Zn	Hf	Hf	Al	Al	Al	In	3.476	0.775
Sr	Zn	Sn	Sn	Al	Al	Al	Ga	1.393	0.928	Be	Ba	Zr	Ge	Ga	Ga	Y	2.521	0.582	Be	Ca	Ba	Cd	Zr	Zr	Zr	Zr	3.001	0.697	Mg	Mg	Zr	Zr	Al	Ga	In	In	3.476	0.496	
Ba	Ba	Si	Sn	Ga	Ga	Ga	Sc	1.393	0.993	Zn	Zn	Ti	Ti	Ga	In	In	Y	2.521	0.631	Ca	Ca	Hf	Hf	Al	Al	Ga	Sc	3.002	0.679	Be	Cd	Cd	Cd	Ge	Ti	Ti	Hf	3.476	0.622
Ba	Ba	Cd	Cd	Si	Ge	Sn	Sn	1.395	1.020	Cd	Cd	Ti	Hf	In	In	Sc	Sc	2.521	0.538	Cd	Ca	Sr	Cd	Ti	Ti	Ti	Zr	3.002	0.725	Be	Ba	Ba	Ba	Sn	Ti	Hf	Hf	3.476	0.534
Ca	Zn	Sn	Sn	Al	Ga	Ga	Sc	1.395	0.899	Ba	Ba	Si	Zr	Al	Al	Ga	Ga	2.522	0.577	Zn	Cd	Zr	Zr	Sc	Sc	Y	Y	3.002	1.063	Ca	Ba	Ba	Ba	Sn	Ti	Ti	Hf	3.476	0.575
Be	Ba	Ge	Zr	In	In	In	In	1.395	0.976	Sr	Cd	Cd	Cd	Si	Ti	Zr	Zr	2.522	0.611	Be	Be	Be	Sr	Sn	Sn	Ti	Zr	3.002	1.372	Mg	Mg	Ba	Ba	Sn	Sn	Ti	Ti	3.477	0.598
Ca	Zn	Sn	Hf	In	In	In	In	1.396	0.999	Sr	Sr	Cd	Cd	Sn	Sn	Ti	Ti	2.522	0.599	Be	Be	Zn	Cd	Ge	Hf	Hf	Hf	3.002	0.667	Mg	Mg	Ba	Ba	Sn	Zr	Zr	Hf	3.477	0.516
Mg	Mg	Sn	Sn	Al	Al	Y	Y	1.396	1.044	Sr	Ba	Ba	Cd	Si	Si	Si	Sn	2.522	0.603	Be	Be	Cd	Cd	Sn	Ti	Hf	Hf	3.002	0.621	Mg	Mg	Mg	Ba	Si	Si	Ge	Sn	3.477	0.565
Sr	Cd	Ge	Ge	Ga	Ga	Y	Y	1.396	1.051	Zn	Cd	Zr	Zr	Ga	Ga	Y	Y	2.523	0.711	Be	Ba	Ba	Cd	Cd	Si	Si	Si	Zr	3.002	0.791	Ca	Ca	Ba	Si	Sn	Sn	Ti	3.477	0.825
Ba	Cd	Si	Si	Ga	In	In	In	1.397	0.906	Ba	Ba	Cd	Cd	Sn	Ti	Ti	Ti	2.523	0.591	Mg	Mg	Ca	Sr	Si	Sn	Sn	Sn	3.002	1.014	Be	Be	Ge	Ti	Ga	Ga	Ga	Y	3.477	0.668
Sr	Ba	Cd	Cd	Ge	Sn	Sn	Sn	1.398	0.988	Mg	Zn	Zn	Cd	Sn	Sn	Sn	Ti	2.523	0.639	Mg	Sr	Sr	Zn	Sn	Sn	Ti	Ti	3.002	1.280	Be	Zn	Hf	Hf	Ga	Ga	Ga	Sc	3.477	0.658
Cd	Cd	Ge	Zr	Al	In	In	In	1.398	0.991	Ba	Ba	Zn	Cd	Si	Si	Ge	Ge	2.523	0.804	Ca	Ba	Hf	Hf	Sc	Y	Y	Y	3.002	0.751	Mg	Sr	Sr	Zn	Ti	Ti	Ti	Zr	3.477	0.815
Ca	Ca	Ge	Ge	Ga	In	In	Sc	1.399	0.862	Sr	Sr	Sr	Cd	Ge	Sn	Sn	Ti	2.523	0.500	Ca	Zn	Zr	Zr	Ga	Y	Y	Y	3.002	0.688	Sr	Sr	Sr	Ba	Ge	Ge	Sn	Hf	3.477	0.645
Be	Mg	Sn	Sn	In	In	Y	Y	1.399	0.294	Ca	Zn	Cd	Ge	Ge	Ge	Hf	2.523	0.577	Sr	Sr	Ba	Zn	Si	Ge	Ge	Ge	3.002	0.810	Ca	Sr	Sr	Sr	Si	Ge	Zr	Zr	3.477	0.478	
Zn	Cd	Ge	Ge	In	In	Y	Y	1.399	0.179	Be	Sr	Ti	Ti	Ga	Y	Y	Y	2.523	0.699	Be	Be	Ba	Cd	Cd	Si	Si	Zr	3.003	1.016	Ca	Ba	Ba	Si	Zr	Hf	Hf	Hf	3.477	0.411
Ba	Ba	Si	Ge	Al	In	In	In	1.401	0.123	Ca	Ba	Cd	Cd	Si	Si	Si	Hf	2.523	0.508	Cd	Cd	Zr	Hf	Al	Al	Al	Ga	3.003	1.275	Mg	Mg	Sr	Zn	Ge	Hf	Hf	Hf	3.477	0.415
Cd	Cd	Ge	Zr	Ga	In	In	In	1.401	0.385	Ca	Ba	Sn	Ti	Al	Al	Al	Al	2.523	0.572	Mg	Ca	Zn	Zn	Sn	Sn	Ti	Ti	3.003	0.772	Mg	Mg	Sr	Sr	Ge	Ge	Sn	Ti	3.478	0.566
Zn	Cd	Ge	Ge	Ga	Ga	In	In	1.401	0.271	Ca	Ba	Zn	Zn	Si	Si	Ge	Ti	2.524	0.740	Ca	Sr	Si	Hf	Al	Al	Al	Al	3.003	0.705</										

Be	Mg	Sn	Sn	In	In	Y	Y	1.450	-0.141	Sr	Sr	Si	Ge	Ga	Sc	Sc	2.533	0.251	Ba	Cd	Zr	Zr	Sc	Sc	Y	Y	3.013	0.823	Be	Ca	Sr	Sr	Sn	Sn	Zr	Zr	3.488	-0.119		
Sr	Cd	Si	Si	Ga	In	In	In	1.450	0.592	Ca	Ca	Si	Ti	Ti	Ga	In	In	2.533	0.331	Mg	Cd	Hf	Hf	Al	Y	Y	Y	3.013	1.044	Be	Be	Ge	Ge	Al	Sc	Sc	Y	3.488	0.765	
Be	Ca	Sn	Sn	Ga	In	Ga	Sc	1.450	0.580	Ca	Zn	Ge	Sn	Al	Al	Al	2.533	0.498	Mg	Mg	Ca	Sr	Ge	Sn	Sn	Sn	3.013	0.662	Mg	Ca	Ca	Sr	Sn	Sn	Sn	Zr	3.488	0.663		
Sr	Ba	Ge	Ge	In	In	Y	Y	1.451	-0.087	Be	Ba	Zr	Zr	Al	Y	Y	2.533	0.151	Be	Be	Hf	Hf	Ga	In	In	Y	3.013	0.600	Be	Zn	Zr	Zr	Al	Al	Al	In	3.488	0.519		
Mg	Cd	Ge	Ge	In	In	In	Sc	1.451	0.445	Ca	Cd	Ge	Ge	Al	Y	Y	2.533	0.304	Mg	Cd	Zr	Hf	Ga	Ga	Ga	Ga	3.013	0.732	Mg	Ca	Ba	Ba	Sn	Al	Hf	Hf	3.488	0.017		
Mg	Sr	Sn	Sn	Ga	Y	Y	Y	1.452	0.463	Cd	Cd	Zr	Zr	Ga	Ga	In	Sc	2.533	0.457	Sr	Zn	Zr	Zr	Al	Y	Y	Y	3.013	0.837	Be	Be	Zn	Zn	Si	Sn	Ti	Ti	3.488	0.091	
Sr	Cd	Si	Hf	In	In	In	In	1.452	0.182	Ba	Ba	Ti	Ti	Al	In	Y	Y	2.533	0.224	Mg	Ca	Zr	Zr	Al	Ga	Ga	Y	3.013	1.028	Sr	Ba	Ba	Ba	Si	Sn	Sn	Hf	3.488	0.231	
Be	Sr	Ge	Hf	In	In	In	In	1.452	0.448	Be	Cd	Ge	Y	Y	Y	Y	2.534	0.320	Zn	Zn	Zr	Zr	Ga	In	Sc	Sc	3.014	0.680	Sr	Ba	Ba	Ba	Ge	Sn	Sn	Zr	3.488	0.340		
Mg	Zn	Sn	Sn	Al	Al	Al	In	1.453	0.451	Mg	Sr	Zr	Zr	Ga	Ga	In	2.534	0.518	Zn	Cd	Zr	Zr	Ga	Ga	Ga	Sc	3.014	0.606	Be	Sr	Ba	Ba	Ba	Sn	Zr	Zr	3.488	0.321		
Sr	Sr	Cd	Cd	Si	Ge	Sn	Sn	1.453	0.137	Cd	Cd	Ge	Zr	In	Y	Y	2.534	0.138	Ca	Ca	Sr	Cd	Si	Si	Ti	Ti	3.014	0.644	Be	Ca	Zn	Zr	Ge	Hf	Hf	Hf	3.488	0.307		
Cd	Cd	Sn	Sn	Al	Al	Ga	Sc	1.453	0.447	Be	Sr	Sn	Zr	Y	Y	Y	2.534	0.309	Be	Be	Ba	Ba	Zn	Ge	Zr	Zr	3.014	1.158	Ca	Ca	Sr	Ba	Ti	Ti	Ti	Zr	3.488	0.091		
Ca	Ba	Cd	Cd	Ge	Sn	Sn	Sn	1.453	0.449	Mg	Zn	Sn	Sn	Sc	Sc	Y	Y	2.534	0.529	Sr	Zn	Zr	Zr	Al	Al	Al	In	3.014	1.552	Mg	Sr	Si	Si	Sc	Sc	Y	Y	3.489	0.342	
Ca	Zn	Sn	Zr	In	In	In	In	1.453	0.154	Ba	Ba	Ti	Ti	Al	Al	In	Y	2.534	0.123	Cd	Cd	Ti	Ti	Ga	Sc	Sc	Y	3.014	0.625	Be	Be	Sr	Sr	Si	Sn	Zr	Zr	3.489	0.608	
Ba	Ba	Ge	Hf	In	In	In	Y	1.455	0.397	Mg	Ca	Hf	Hf	Ga	In	In	2.534	0.307	Ca	Ca	Ge	Hf	Sc	Sc	Y	Y	3.014	0.659	Be	Be	Si	Hf	Ga	Ga	Ga	In	3.489	0.385		
Sr	Cd	Ge	Ge	Ga	Ga	Ga	Sc	1.456	0.342	Ba	Zn	Zn	Cd	Si	Si	Si	Hf	2.535	0.600	Cd	Cd	Si	Hf	In	Sc	Sc	Sc	3.014	0.847	Mg	Mg	Sr	Zn	Si	Hf	Hf	Hf	3.489	0.565	
Be	Cd	Ge	Ge	In	In	In	Y	1.457	0.068	Sr	Sr	Ge	Zr	Al	Al	Y	Y	2.535	0.381	Zn	Zn	Si	Ti	In	Y	Y	Y	3.014	1.305	Sr	Sr	Ba	Ba	Ge	Ge	Sn	Hf	3.489	0.697	
Cd	Cd	Ge	Ge	Ga	Ga	In	Sc	1.457	0.401	Sr	Zn	Hf	Hf	In	In	Sc	Sc	2.535	0.455	Mg	Mg	Ba	Cd	Ge	Zr	Zr	Zr	3.014	1.688	Zn	Zn	Si	Zr	Ga	Sc	Sc	Sc	3.489	0.056	
Ca	Sr	Cd	Cd	Si	Sn	Sn	Sn	1.457	0.339	Mg	Mg	Ba	Ba	Zn	Ge	Sn	Sn	2.535	0.559	Mg	Ca	Cd	Cd	Ge	Ge	Hf	Hf	3.014	0.837	Ca	Ba	Ba	Ba	Si	Si	Zr	Hf	3.489	0.051	
Ba	Ba	Si	Sn	Al	Al	Ga	Ga	1.458	0.059	Zn	Zn	Ge	Zr	Ga	Ga	Ga	Y	2.535	0.488	Be	Ba	Ba	Ba	Zn	Sr	Zr	Zr	3.014	0.845	Be	Be	Si	Hf	Ga	Ga	Ga	Y	3.489	-0.029	
Ca	Sr	Sn	Zr	In	In	In	In	1.460	0.628	Sr	Sr	Cd	Cd	Si	Zr	Hf	Hf	2.535	0.497	Zn	Zn	Zn	Cd	Cd	Sn	Ti	Zr	3.015	0.516	Ca	Ca	Ba	Ba	Si	Si	Sn	Hf	3.489	0.657	
Sr	Sr	Zn	Cd	Si	Sn	Sn	Sn	1.460	0.618	Ba	Cd	Si	Si	In	Y	Y	Y	2.535	0.606	Zn	Cd	Cd	Cd	Si	Si	Ge	Zr	3.015	0.812	Ca	Ca	Ba	Ba	Si	Zr	Hf	Hf	3.489	0.495	
Ba	Cd	Cd	Cd	Si	Ge	Sn	Sn	1.462	0.108	Ba	Ba	Ba	Cd	Sn	Ti	Hf	Hf	2.535	0.397	Mg	Zn	Zn	Zn	Ge	Ge	Sn	Ti	3.015	1.144	Be	Ca	Ca	Zn	Ge	Ge	Ge	Hf	3.490	0.243	
Ba	Ba	Zn	Cd	Ge	Sn	Sn	Sn	1.462	0.460	Mg	Mg	Sn	Al	Al	Sc	Sc	Y	2.535	0.494	Be	Be	Si	Si	Ga	In	In	Y	3.015	0.562	Be	Ca	Ca	Sr	Sn	Sn	Sn	Ti	3.490	0.953	
Sr	Sr	Sn	Hf	Al	In	In	In	1.463	0.406	Ba	Ba	Sn	Ti	Ti	Al	Al	Ga	Y	2.536	0.614	Be	Ca	Cd	Cd	Ge	Ge	Ge	Ti	3.015	0.588	Be	Mg	Hf	Hf	Ga	Sc	Sc	Sc	3.490	0.710
Mg	Ba	Ge	Ge	Al	Al	In	In	1.465	0.507	Ba	Zn	Ti	Hf	Ga	Ga	Ga	2.536	0.380	Sr	Cd	Hf	Hf	Sc	Sc	Y	Y	3.015	0.621	Ca	Ca	Sr	Zn	Zr	Zr	Si	Hf	3.490	0.333		
Ca	Sr	Sn	Ti	In	In	In	In	1.465	0.462	Ca	Ca	Cd	Cd	Ge	Ti	Hf	Hf	2.536	0.494	Sr	Cd	Hf	Hf	Ga	Sc	Sc	Sc	3.015	0.805	Mg	Ba	Ba	Zn	Zn	Zi	Si	Zr	3.490	0.127	
Ba	Ba	Sn	Sn	Ga	Sc	Sc	Y	1.465	0.402	Cd	Cd	Hf	In	In	Sc	Y	Y	2.536	0.638	Mg	Ba	Hf	Hf	Al	Al	Al	Sc	3.015	1.094	Ca	Cd	Sr	Ba	Ti	Ti	Ti	Hf	3.490	0.148	
Cd	Cd	Sn	Hf	In	In	In	Sc	1.465	0.499	Mg	Sr	Sr	Cd	Sn	Sn	Ti	Ti	2.536	0.880	Mg	Sr	Si	Si	Al	Al	Al	Y	3.015	0.681	Mg	Cd	Zr	Zr	Al	Al	Al	Ga	3.491	0.093	
Sr	Sr	Ge	Sn	Ga	Ga	Y	Y	1.465	0.668	Ba	Ba	Sn	Hf	Sc	Sc	Y	Y	2.536	0.779	Be	Be	Be	Cd	Ti	Zr	Hf	Hf	3.015	0.686	Ca	Ca	Sr	Sr	Si	Si	Ge	Sn	3.491	0.393	
Ca	Ba	Sn	In	Y	Y	Y	Y	1.467	0.659	Mg	Cd	Cd	Cd	Ge	Sn	Sn	Ti	2.536	0.664	Be	Be	Ba	Cd	Ge	Ti	Ti	Ti	3.015	0.646	Ca	Ca	Ba	Ba	Si	Ti	Ti	Hf	3.491	0.377	
Mg	Sr	Sn	Sn	In	Sc	Sc	Sc	1.467	0.552	Ba	Ba	Zn	Cd	Si	Si	Ti	Ti	2.536	0.803	Ba	Ba	Ti	Zr	Al	Sc	Sc	Sc	3.015	0.813	Ca	Ca	Sr	Sr	Ge	Ge	Zr	Hf	3.491	0.199	
Mg	Sr	Si	Sn	Ga	Ga	Ga	Ga	1.467	0.582	Be	Be	Si	Ge	Ga	In	In	2.536	0.784	Mg	Mg	Zr	Hf	In	Y	Y	Y	3.015	1.095	Be	Be	Be	Zn	Si	Si	Ge	Sn	3.491	1.110		
Ba	Ba	Sn	Sn	Al	Y	Y	Y	1.468	0.568	Sr	Zn	Ti	Ti	Ga	Ga	In	2.536	0.669	Mg	Be	Be	Zn	Sn	Zr	Hf	Hf	3.015	0.706	Mg	Sr	Sr	Ba	Sn	Hf	Hf	Hf	3.491	1.016		
Cd	Cd	Sn	Zr	Al	Al	Al	In	1.468	0.390	Zn	Zn	Sn	Cd	Ge	Y	Y	Y	2.536	0.787	Ca	Ca	Ca	Zn	Ge	Sn	Hf	Hf	3.015	0.707	Ca	Sr	Ba	Ba	Ti	Ti	Ti	Zr	3.491	0.877	
Ba	Cd	Sn	Sn	In	Y	Y	Y	1.470	0.411	Sr	Ba	Cd	Cd	Si	Zr	Zr	Zr	2.537	0.784	Ca	Ca	Si	Zr	Al	Al	Y	Y	3.016	0.987	Be	Cd	Cd	Cd	Ge	Ti	Ti	Zr	3.491	0.302	
Ca	Ca	Ge	Ge	In	In	Sc	Y	1.471	0.296	Cd	Sr	Ti	Ti	In	In	Sc	Sc	2.537	0.431	Zn	Zn	Zn	Cd	Si	Ge	Zr	Zr	3.016	1.460	Mg	Ca	Cd	Zn	Si	Si	Ge	Ge	3.491	0.436	
Sr	Zn	Ge	Ge	Ga	Ga	Y	Y	1.471	0.174	Mg	Ba	Si	Ti	Ti	Ga	Ga	Ga	2.537	0.349	Ca	Ca	Ge	Ti	Al	Sc	Sc	Sc	3.016	1.839	Mg	Ca	Cd	Si	Ti	Y	Y	Y	3.491	0.583	
Be	Sr	Ge	Ge	In	In	Sc	Sc	1.471	0.403	Ba	Ba	Zn	Zn	Si	Si	Hf	Hf	2.537	0.381	Be	Sr	Si	Zr	Y	Y	Y	Y	3.016	0.943	Mg	Mg	Sn	Ti	Ga	Sc	Sc	Sc	3.492	0.580	
Ca	Ba	Sn	Sn	In	Sc	Sc	Sc	1.472	0.311	Cd	Cd	Zr	Hf	In	In	Sc	Sc	2.537	0.441	Ca	Ca	Ca	Zn	Sn	Sn	Zr	Hf	3.016	0.920	Sr	Sr	Sr	Sr	Si	Ge	Sn	Hf	3.492	0.649	
Ba	Ba	Sn	Hf	Al	Al	In	In	1.473	0.183	Ba	Ba	Hf	Hf	Al	Ga	Ga	Sc	2.537	0.341	Ca	Ca	Si	Hf	In	Sc	Sc	Sc	3.016	0.635	Be	Ca	Si	Si	Sc	Y	Y	Y	3.492	0.653	
Ca	Sr	Sn	Sn	Al	Al	Al	Ga	1.473	0.464	Mg	Sr	Si	Si	Al	Ga	Ga	Ga	2.537	0.380	Cd	Cd	Zr	Hf	In	Sc	Sc	Sc	3.016	0.947	Be	Zn	Ti	Ti	Al	Ga	Ga	Ga	3.492	0.379	
Ba	Ba	Sn	Zr	In	In	In	Sc	1.473	0.324	Zn	Zn	Cd	Cd	Sn	Sn	Zr	Hf	2.538	0.418	Mg	Mg	Ba	Zn	Sn	Sn	Sn	Ti	3.016	1.274	Mg	Sr	Sr	Sr	Sn	Sn	Ti	Hf	3.492	0.682	
Cd	Cd	Sn	Sn	In	Sc	Y	Y	1.474	0.198	Mg	Mg	Mg	Si	Sn	Ga	Y	Y	Y	2.538	0.405	Mg	Mg	Sr	Cd	Ge	Ge	Ge	Hf	3.016	0.644	Ca	Sr	Sr	Zn	Si	Si	Zr	3.492	0.948	
Ca	Ba	Ge	Ge	In	In	Sc	Sc	1.474	0.472	Mg	Zn	Hf	Hf	In	In	Y	Y	2.538	0.409	Ca	Zn	Ti	Ti	Al	Al	Y	Y	3.016	0.642	Sr	Sr	Sr	Sr	Si	Sn	Ti	Hf	3.493	0.628	
Sr	Ba	Ge	Ge	In	In	Sc	Sc	1.474	0.326	Sr	Sr	Si	Si	Al	Al	Al	Al	2.539	0.762	Sr	Ba	Ti	Ti	Ga	Sc	Sc	Sc	3.016	0.727	Mg	Mg	Sr	Zn	Sn	Sn	Ti	Ti	3.493	0.887	
Be	Mg	Ge	Sn	In	In	In	In	1.474	0.201	Be	Ca	Ca	Cd	Ge	Ge	Ge</																								

Cd	Cd	Sn	Zr	In	In	In	Sc	1.520	0.650	Be	Ca	Ca	Cd	Sn	Sn	Sn	Hf	2.549	0.404	Be	Be	Ti	Zr	In	In	In	Y	3.024	0.782	Ca	Ca	Ba	Ba	Si	Si	Sn	Zr	3.500	0.822
Be	Ba	Ba	Sn	Al	Al	Al	Sc	1.520	0.515	Ca	Zn	Zr	Zr	In	In	In	Sc	2.549	0.591	Ca	Sr	Si	Cd	Ge	Y	Y	Y	3.024	0.736	Mg	Ca	Zn	Sn	Hf	Hf	Hf	3.500	0.734	
Be	Ba	Ba	Cd	Si	Sn	Sn	Sn	1.520	0.236	Sr	Ba	Zn	Zr	Sc	Sc	Sc	Sc	2.549	0.422	Zn	Zn	Cd	Ge	Y	Ti	Hf	3.025	0.834	Mg	Bz	Zn	Zn	Si	Si	Zr	Zr	3.500	0.444	
Ba	Ca	Ge	Ge	In	In	Y	Y	1.521	0.665	Be	Be	Be	Cd	Si	Ge	Sn	Sn	2.549	0.397	Be	Be	Be	Sr	Ge	Sn	Zr	Zr	3.025	1.128	Mg	Ca	Zr	Hf	Sc	Sc	Sc	3.500	0.554	
Ba	Ba	Sn	Ti	In	In	In	Sc	1.521	0.518	Cd	Cd	Si	Sn	Sc	Y	Y	Y	2.550	0.520	Zn	Cd	Si	Ti	Al	Al	In	3.025	1.414	Mg	Zn	Zr	Zr	In	Sc	Sc	3.500	0.618		
Ca	Sr	Ge	Ge	In	In	Sc	Sc	1.521	0.238	Sr	Sr	Zn	Cd	Ge	Hf	Hf	Hf	2.550	0.497	Sr	Ba	Si	Ti	Al	Al	Al	3.025	0.751	Be	Ba	Ba	Ba	Si	Ge	Ti	Hf	3.501	0.648	
Ca	Sr	Zn	Cd	Sn	Sn	Sn	Sn	1.521	0.693	Ca	Sr	Zn	Zn	Ge	Sn	Sn	Sn	2.550	0.487	Ca	Sr	Ge	Zr	Y	Y	Y	3.025	0.677	Be	Ba	Ca	Ba	Sn	Sn	Hf	3.501	0.794		
Ca	Zn	Ge	Sn	Sn	Ga	Ga	Ga	1.522	0.508	Ca	Sr	Ge	Ge	Al	Sc	Sc	Sc	2.550	0.651	Mg	Mg	Cd	Cd	Ge	Si	Ti	Hf	3.025	0.899	Mg	Mg	Ba	Ti	Zr	Zr	Hf	3.501	0.894	
Ba	Zn	Si	Hf	In	In	In	In	1.522	0.220	Be	Sr	Ti	Ti	Ti	Ga	Ga	Y	2.550	0.525	Be	Be	Cd	Cd	Si	Si	Ge	Sn	3.025	1.081	Be	Be	Ca	Zn	Si	Si	Hf	3.501	0.629	
Sr	Zr	Ge	Ge	In	In	Sc	Sc	1.522	0.712	Mg	Ba	Zr	Zr	Al	Al	In	In	2.550	0.612	Ca	Ca	Si	Ge	Al	Sc	Sc	Sc	3.025	1.326	Mg	Mg	Si	Si	In	Sc	Sc	Y	3.501	0.613
Be	Sr	Sn	Sn	Al	Al	Y	Y	1.523	0.570	Mg	Ba	Hf	Hf	Ga	Ga	Ga	In	2.550	0.755	Cd	Cd	Ti	Hf	Al	Al	Ga	3.025	0.837	Ca	Ca	Ca	Sr	Sn	Zr	Zr	Hf	3.501	0.654	
Ca	Ba	Ge	Ge	Al	Ga	Ga	Ga	1.524	0.216	Mg	Sr	Sr	Zr	Zr	In	Y	Y	2.550	0.416	Ca	Cd	Ge	Hf	Al	Sc	Sc	Sc	3.025	0.748	Be	Ca	Cd	Cd	Zr	Hf	Hf	3.501	0.539	
Ca	Ca	Si	Sn	Ga	Ga	Ga	Ga	1.524	0.959	Be	Mg	Ge	Ge	Ga	Ga	Ga	In	2.551	0.575	Ca	Ba	Zr	Hf	Y	Y	Y	3.025	0.917	Mg	Ca	Ba	Zn	Si	Si	Si	Hf	3.501	0.525	
Ba	Cd	Sn	Hf	Ga	Ga	Ga	Ga	1.524	0.940	Be	Zn	Si	Si	Ge	Ga	Ga	In	2.551	0.714	Mg	Ba	Zr	Zr	Sr	Sc	Sc	Y	3.025	1.083	Mg	Ba	Zn	Zn	Si	Ti	Ti	3.502	0.501	
Zn	Zn	Sn	Sn	Al	Ga	Ga	Y	1.524	0.331	Ba	Ba	Zn	Cd	Ge	Ge	Ti	Hf	2.551	0.900	Mg	Zn	Hf	Hf	Al	Al	Y	3.025	1.322	Mg	Ca	Zr	Zr	Al	Al	Ga	3.502	0.388		
Cd	Cd	Si	Ge	In	In	Y	Y	1.525	0.698	Mg	Ba	Zn	Sn	Hf	Ga	Ga	Ga	2.551	0.591	Be	Ba	Hf	Hf	Al	Al	Sc	3.025	0.858	Be	Be	Ca	Sr	Ge	Ge	Al	3.502	0.700		
Be	Sr	Sn	Sn	Sc	Sc	Sc	Sc	1.525	0.577	Zn	Zn	Zr	Zr	Al	In	In	Y	2.551	0.734	Be	Be	Be	Cd	Sn	Ti	Ti	Zr	3.025	0.765	Ca	Sr	Sr	Ge	Sn	Sn	Hf	3.502	0.677	
Ba	Ba	Sn	Zr	Al	In	In	In	1.525	0.584	Ca	Ca	Si	Hf	Ga	Ga	Ga	Ga	2.551	0.386	Ba	Zn	Si	Hf	Y	Y	Y	3.026	0.739	Mg	Cd	Si	Ge	Sc	Sc	Sc	3.502	0.423		
Be	Ba	Ba	Cd	Ge	Sn	Sn	Sn	1.525	0.716	Ca	Ca	Ca	Cd	Si	Sn	Sn	Hf	2.551	0.560	Zn	Cd	Cd	Cd	Sn	Zr	Zr	Hf	3.026	0.865	Be	Be	Ca	Al	Ga	Sc	Sc	3.502	0.568	
Sr	Cd	Sn	Sn	In	Y	Y	Y	1.526	0.579	Mg	Cd	Hf	Hf	Al	Al	In	In	2.551	0.738	Ca	Cd	Hf	Hf	Ga	Sc	Sc	Sc	3.026	1.089	Ca	Ca	Ba	Ge	Ti	Hf	Hf	3.502	0.559	
Sr	Sr	Sn	Ti	In	In	In	Sc	1.527	0.581	Ba	Ba	Si	Zr	Zr	Ga	Ga	Y	2.551	0.366	Ba	Cd	Hf	Hf	Sc	Y	Y	3.026	0.712	Be	Be	Si	Ti	Al	Al	Y	Y	3.502	0.361	
Mg	Ba	Ge	Ge	Al	Ga	Ga	Ga	1.529	0.945	Ca	Sr	Si	Zr	Zr	Ga	Ga	Ga	2.551	0.555	Mg	Sr	Cd	Cd	Si	Hf	Hf	Hf	3.026	0.648	Mg	Mg	Hf	Hf	Al	Al	Sc	Y	3.502	0.802
Zn	Zn	Si	Sn	In	In	In	Sc	1.529	0.926	Zn	Zn	Sn	Ti	Al	Al	Y	Y	2.551	0.874	Ba	Ba	Ba	Zn	Ge	Zr	Hf	Hf	3.026	0.757	Be	Mg	Cd	Cd	Ge	Ti	Ti	Ti	3.502	0.795
Ba	Ba	Ge	Ge	Al	Ga	Ga	Y	1.530	0.699	Ca	Ca	Zn	Zn	Ge	Sn	Sn	Ti	2.552	0.662	Mg	Mg	Ti	Ti	In	In	Sc	Y	3.026	0.866	Be	Be	Mg	Zn	Zr	Zr	Hf	3.503	0.426	
Mg	Ba	Cd	Cd	Ge	Sn	Sn	Sn	1.530	0.866	Ca	Zn	Zn	Zn	Ge	Ge	Sn	Zr	2.552	0.736	Be	Be	Be	Ba	Ti	Ti	Zr	Hf	3.026	1.084	Ca	Sr	Zn	Zn	Zr	Hf	Hf	3.503	0.731	
Mg	Cd	Ge	Ge	In	In	Y	Y	1.531	0.843	Sr	Sr	Zn	Cd	Ge	Zr	Zr	Zr	2.552	0.835	Mg	Ca	Zn	Zn	Ge	Ge	Hf	Hf	3.026	0.731	Sr	Sr	Sr	Ba	Si	Sn	Sn	Ti	3.503	0.711
Zn	Zn	Si	In	In	In	Y	Y	1.532	0.639	Sr	Cd	Ge	Zr	Al	Al	Al	Al	2.552	0.781	Ba	Ba	Ba	Zn	Ti	Ti	Zr	Hf	3.027	0.664	Mg	Ca	Zn	Ge	Hf	Hf	Hf	3.503	0.552	
Mg	Zn	Sn	Sn	Ga	Ga	Y	Y	1.533	0.526	Ca	Cd	Ti	Ti	Ti	Ga	Ga	Y	2.552	0.780	Be	Cd	Sn	Hf	Sc	Sc	Sc	Sc	3.027	0.795	Mg	Ba	Ba	Ba	Si	Sn	Ti	Ti	3.503	0.596
Be	Ca	Ge	Ge	Ga	Ga	In	In	1.534	0.459	Sr	Sr	Zn	Cd	Ti	Ti	Ti	Hf	2.552	0.841	Ca	Zn	Zn	Zn	Sn	Ti	Ti	Hf	3.027	0.880	Sr	Sr	Sr	Si	Ge	Sn	Zr	3.503	0.536	
Be	Sr	Ba	Cd	Sn	Sn	Sn	Sn	1.536	0.331	Ba	Ba	Ge	Zr	In	Y	Y	Y	2.552	0.664	Ba	Ba	Ba	Zn	Si	Zr	Hf	Hf	3.027	1.070	Ca	Ca	Sr	Sr	Ge	Ge	Sn	Hf	3.503	0.431
Sr	Ba	Ge	Al	Al	In	In	In	1.536	0.435	Sr	Cd	Cd	Cd	Ti	Zr	Hf	Hf	2.552	0.760	Be	Ca	Ti	Ti	Ti	Ga	Ga	Y	3.027	0.750	Mg	Mg	Ba	Zn	Ti	Ti	Ti	Hf	3.503	0.855
Be	Ca	Sn	Sn	Ga	Y	Y	Y	1.536	0.446	Ca	Ba	Hf	Hf	In	Y	Y	Y	2.552	0.862	Ba	Cd	Hf	Hf	Al	Sc	Sc	Sc	3.027	0.671	Ca	Ba	Ba	Ba	Ge	Sn	Hf	3.504	0.762	
Sr	Cd	Si	Si	Al	In	In	In	1.536	0.311	Sr	Sr	Si	Si	Al	In	Sc	Sc	2.552	0.642	Mg	Zn	Zn	Cd	Sn	Sn	Ti	Ti	3.027	0.365	Mg	Ba	Ba	Ba	Sn	Ti	Ti	Ti	3.504	0.465
Mg	Sr	Sn	Sn	Al	Al	Al	Ga	1.537	0.360	Sr	Zn	Ti	Ti	Ga	Ga	Ga	Y	2.553	0.756	Ca	Ca	Sr	Zn	Sn	Sn	Ti	Ti	3.027	1.139	Ca	Sr	Ba	Ba	Si	Ge	Sn	Hf	3.504	0.589
Ba	Ba	Ge	Ge	Al	Ga	In	Ga	1.537	0.403	Sr	Zn	Si	Si	Ti	Ga	Ga	Sc	2.553	0.939	Mg	Mg	Cd	Cd	Sn	Ti	Ti	Hf	3.028	1.555	Ca	Ba	Ba	Si	Hf	Hf	Hf	3.504	0.642	
Sr	Zn	Sn	Sn	Al	Al	Al	In	1.537	0.270	Ca	Ba	Hf	Hf	Al	Al	In	In	2.553	1.091	Zn	Zn	Sn	Ti	Al	Al	Sc	Sc	3.028	0.267	Be	Be	Sr	Sr	Ge	Ti	Hf	Hf	3.504	0.663
Sr	Cd	Si	Ti	In	In	In	In	1.539	0.348	Zn	Cd	Hf	Cd	Ge	Ge	Sn	Ti	2.553	1.178	Ca	Cd	Zr	Zr	Al	Al	In	3.028	0.356	Be	Be	Sr	Sr	Ge	Sn	Hf	Hf	3.504	0.823	
Ba	Ba	Sn	Hf	Ga	Ga	In	Ga	1.539	0.396	Mg	Sr	Zn	Zn	Sn	Sn	Sn	Hf	2.554	0.924	Ca	Zn	Zr	Zr	Al	Ga	Ga	Ga	3.028	0.599	Ca	Ba	Ba	Si	Sn	Ti	Ti	3.505	0.844	
Mg	Ca	Ge	Sn	Ga	Ga	Ga	Ga	1.539	0.264	Sr	Sr	Cd	Cd	Si	Zr	Zr	Hf	2.554	1.089	Cd	Cd	Cd	Si	Zr	Al	Y	Y	3.028	1.302	Be	Mg	Mg	Sr	Ge	Ge	Sn	3.505	0.711	
Ca	Ca	Sn	Ti	In	In	Y	Y	1.539	0.726	Mg	Mg	Cd	Cd	Ge	Zr	Zr	Hf	2.554	1.067	Mg	Ba	Zr	Zr	Al	Al	Al	Ga	3.028	1.705	Mg	Mg	Mg	Cd	Ge	Ti	Ti	Zr	3.505	0.650
Sr	Sr	Sn	Sn	In	Sc	Y	Y	1.539	0.768	Ca	Zn	Cd	Cd	Ge	Ge	Zr	Hf	2.554	0.922	Mg	Ba	Ca	Zn	Sn	Sn	Sn	Hf	3.029	0.523	Ca	Sr	Sr	Sr	Ge	Zr	Hf	Hf	3.505	0.693
Mg	Ba	Cd	Cd	Si	Sn	Sn	Sn	1.541	0.363	Sr	Cd	Zr	Hf	Ga	Ga	Ga	Y	2.554	1.068	Ca	Sr	Zn	Zn	Si	Si	Ti	Ti	3.029	0.588	Ba	Ba	Ba	Si	Ge	Ti	Zr	3.505	0.577	
Mg	Mg	Sn	Cd	Sn	In	In	Sc	1.541	0.670	Sr	Ti	Ti	Ti	Al	In	Y	Y	2.554	1.064	Ca	Cd	Ti	Ti	Ga	Y	Y	Y	3.029	0.358	Sr	Sr	Sr	Ba	Ge	Ti	Hf	3.505	0.870	
Mg	Ca	Ge	Cd	In	In	Y	Y	1.542	0.729	Ca	Ba	Ge	Hf	Al	Al	Al	Al	2.555	0.666	Ca	Ca	Zr	Hf	Al	Y	Y	Y	3.029	0.849	Mg	Mg	Ca	Cd	Ge	Ge	Ti	Ti	3.505	0.735
Sr	Cd	Cd	Cd	Si	Ge	Sn	Sn	1.542	0.312	Be	Sr	Sr	Zn	Ge	Ge	Ge	Sn	2.555	0.599	Mg	Ba	Zr	Zr	Al	Al	Al	Sc	3.029	1.212	Be	Mg	Ge	Ge	Al	Al	Sc	Sc	3.505	0.475
Mg	Zn	Ge	Ge	In	In	In	Y	1.542	0.659	Sr	Sr	Zr	Zr	Al	Ga	In	Ga	2.555	0.637	Mg	Mg	Ti	Zr	Ga	Ga	Y	Y	3.029	0.406	Ca	Ba	Ba	Ba	Si					

Ba	Zn	Si	Zr	In	In	In	1.579	1.086	Be	Ca	Zn	Zn	Ge	Ge	Sn	2.564	0.968	Sr	Sr	Si	Zr	Sc	Sc	Y	3.039	0.319	Zn	Zn	Si	Ti	In	Sc	Sc	Sc	3.513	1.506		
Sr	Zn	Zn	Cd	Si	Sn	Sn	1.579	0.830	Sr	Sr	Zn	Zn	Si	Si	Sn	2.564	0.897	Sr	Sr	Ti	Ti	Al	Sc	Sc	Y	3.039	0.249	Mg	Zn	Hf	Hf	Ca	Sc	Sc	Sc	3.513	1.853	
Sr	Ba	Ge	Ti	Ga	In	In	1.580	1.163	Mg	Mg	Zn	Cd	Si	Si	Sn	2.564	1.113	Ca	Ca	Zr	Hf	In	Sc	Sc	Sc	3.039	0.496	Mg	Mg	Zr	Zr	Al	Al	Sc	Y	3.513	0.865	
Cd	Cd	Si	Si	In	In	In	1.580	1.082	Zn	Cd	Si	Si	Al	Ga	Ga	2.564	0.989	Mg	Ca	Ca	Cd	Si	Ge	Ge	Ge	3.039	0.640	Ca	Zn	Ti	Ti	Ga	Sc	Sc	Sc	3.513	0.916	
Ba	Ba	Si	Si	Ga	Al	In	1.581	0.820	Ca	Zn	Hf	Hf	Ga	Ga	Y	2.564	0.877	Ba	Ba	Zn	Zn	Ti	Zr	Hf	Hf	3.039	0.629	Be	Be	Sr	Sr	Ge	Sc	Zr	Zr	3.513	0.989	
Be	Ba	Si	Si	Ga	Al	In	1.581	1.358	Ba	Ba	Ba	Cd	Ge	Ge	Sn	2.565	1.103	Ba	Ba	Si	Ti	Al	Al	Sc	Sc	3.039	0.826	Ca	Ca	Sr	Zn	Sn	Ti	Ti	Ti	3.513	0.867	
Ba	Ba	Zn	Cd	Sn	Sn	Sn	1.584	1.346	Mg	Mg	Sn	Zr	Al	Al	In	2.565	0.856	Be	Be	Be	Ba	Si	Si	Sn	Ti	3.039	0.732	Be	Be	Sr	Sr	Ge	Ti	Zr	Zr	3.514	0.793	
Mg	Sr	Sn	Sn	Al	Al	Y	1.584	0.877	Sr	Zn	Cd	Cd	Ti	Zr	Zr	2.565	0.716	Zn	Zn	Zr	Zr	Al	Ga	Ga	Y	3.039	0.291	Ba	Ba	Ba	Si	Ge	Sn	Zr	Zr	3.514	0.639	
Ba	Cd	Cd	Cd	Si	Si	Sn	1.584	1.084	Be	Be	Cd	Cd	Ge	Ge	Sn	2.565	0.707	Be	Be	Be	Ba	Sn	Ti	Zr	3.040	0.296	Be	Be	Be	Mg	Si	Ge	Sn	Sn	3.514	1.046		
Mg	Zn	Ge	Al	In	In	In	1.584	1.113	Mg	Ba	Zr	Zr	Al	In	Sc	2.565	0.877	Mg	Sr	Cd	Cd	Si	Ti	Ti	3.040	0.110	Mg	Mg	Sr	Zr	Ge	Zr	Zr	Zr	3.514	0.899		
Ba	Cd	Cd	Sn	Zr	Ga	Ga	1.584	1.203	Cd	Cd	Ge	Ti	Ga	Ga	Sc	2.565	0.707	Mg	Mg	Ge	Sn	Al	Al	Al	3.040	0.467	Mg	Ca	Sr	Sr	Sn	Ti	Ti	Ti	3.514	0.674		
Ca	Ba	Sn	Sn	Ga	Ga	Y	1.585	1.188	Ba	Ba	Ti	Hf	Ga	Ga	Y	2.565	0.696	Mg	Ba	Zn	Zn	Ge	Ge	Ge	3.040	0.352	Mg	Mg	Ge	Zr	Sc	Y	Y	Y	3.514	0.617		
Mg	Mg	Cd	Cd	Al	In	In	1.585	1.108	Ca	Ba	Ba	Cd	Sn	Sn	Sn	2.565	0.799	Be	Be	Be	Cd	Ti	Zr	Zr	Hf	3.040	0.149	Be	Mg	Ba	Ba	Sn	Zr	Zr	Zr	3.514	0.580	
Ba	Cd	Cd	Cd	Si	Sn	Hf	1.586	1.194	Cd	Cd	Si	Si	Si	Ga	Ga	Y	2.565	0.776	Be	Be	Ti	Hf	Ga	In	In	3.040	0.804	Be	Be	Zn	Cd	Si	Si	Sn	3.514	0.584		
Mg	Ba	Sn	Sn	Al	Al	Sc	1.587	1.364	Ca	Cd	Si	Al	Al	Al	Al	2.565	0.769	Mg	Ba	Zr	Zr	Sc	Sc	Y	Y	3.040	0.643	Mg	Zn	Ti	Hf	Y	Y	Y	Y	3.514	0.771	
Ca	Sr	Ge	Ge	Al	Ga	Ga	1.587	1.353	Sr	Cd	Cd	Cd	Ti	Zr	Zr	2.566	0.540	Ca	Ca	Sr	Cd	Si	Ti	Ti	Y	3.040	0.243	Be	Mg	Ba	Ba	Sn	Hf	Hf	Hf	3.514	0.686	
Cd	Cd	Sn	Sn	In	Sc	Sc	1.587	1.258	Zn	Cd	Cd	Zr	In	Y	Y	2.566	0.413	Be	Sr	Sr	Cd	Zr	Hf	Hf	Hf	3.040	0.263	Mg	Sr	Sr	Sr	Si	Sn	Hf	Hf	3.514	0.649	
Ba	Ba	Sn	Zr	Ga	In	In	1.588	1.265	Ba	Ba	Ba	Cd	Sn	Ti	Zr	2.566	0.378	Mg	Ba	Ba	Cd	Si	Si	Si	Hf	3.040	0.273	Mg	Ba	Ba	Ba	Ge	Sn	Sn	Zr	3.514	1.101	
Ca	Cd	Ge	Ge	Al	Al	Ga	1.589	1.250	Mg	Mg	Sn	Sr	Zr	In	In	2.566	0.828	Sr	Cd	Ti	Ti	Al	Al	Al	Ga	3.040	0.024	Zn	Zn	Zn	Zn	Si	Ti	Zr	Hf	3.514	1.010	
Zn	Zn	Si	Ge	Al	In	Y	1.589	1.100	Sr	Sr	Zn	Cd	Ti	Ti	Ti	2.566	0.463	Be	Ca	Zr	Zr	Sc	Y	Y	Y	3.040	0.654	Sr	Sr	Ba	Ba	Ge	Ti	Hf	Hf	3.514	0.929	
Ba	Cd	Ge	Ge	Al	Al	Ga	1.590	0.462	Ca	Sr	Ge	Ge	Sc	Sc	Y	2.567	0.350	Zn	Zn	Sn	Si	Al	Al	Al	Y	3.040	0.628	Be	Be	Mg	Ba	Sn	Ti	Ti	Ti	3.515	0.709	
Sr	Cd	Sn	Sn	Al	Al	Ga	1.590	0.342	Sr	Sr	Ti	Zr	Al	Al	In	2.567	0.738	Sr	Zn	Si	Si	Al	Y	Y	Y	3.040	0.142	Mg	Mg	Sr	Sr	Si	Si	Sn	Ti	3.515	0.672	
Cd	Cd	Si	Sn	Ga	Ga	Y	1.590	0.245	Ca	Ca	Si	Zr	Ga	Ga	In	2.567	0.375	Be	Be	Ba	Zn	Ti	Ti	Ti	Hf	3.040	0.983	Be	Be	Sn	Hf	Al	Sc	Sc	Sc	3.515	0.792	
Cd	Cd	Si	Ti	Ga	Ga	In	1.591	0.480	Ba	Ba	Ti	Zr	Ga	Ga	Sc	2.567	0.322	Be	Be	Hf	Hf	In	In	Sc	Y	3.041	0.924	Mg	Mg	Mg	Cd	Ti	Zr	Zr	Hf	3.515	0.889	
Be	Ba	Zn	Cd	Sn	Ga	Sn	1.591	0.345	Ba	Ba	Sn	Ti	Sc	Sc	Sc	Y	2.567	0.941	Ca	Ca	Si	Ti	In	Y	Y	Y	3.041	0.714	Mg	Ca	Ca	Cd	Si	Si	Si	Zr	3.515	0.771
Cd	Cd	Sn	Hf	Ga	Ga	Sn	1.591	0.244	Be	Ca	Ca	Cd	Sn	Sn	Hf	Hf	2.567	0.325	Ca	Ca	Zn	Sn	Si	Sn	Zr	3.041	0.439	Ca	Ca	Sr	Sr	Si	Sn	Sn	Zr	3.515	0.833	
Mg	Ba	Si	Si	In	In	In	1.591	0.552	Cd	Cd	Ge	Ti	Al	Al	In	2.567	0.282	Zn	Zn	Si	Hf	Ga	Ga	Sc	Sc	3.041	0.518	Mg	Ba	Ba	Ba	Ti	Ti	Zr	Hf	3.515	0.746	
Ca	Sr	Ge	Hf	In	In	In	1.591	0.349	Be	Sr	Ge	Ge	Sc	Sc	Sc	Y	2.567	0.974	Sr	Ba	Ba	Zn	Ti	Ti	Hf	Hf	3.041	0.431	Mg	Mg	Mg	Cd	Si	Ti	Ti	Hf	3.515	0.875
Ba	Ba	Si	Ge	Ga	Ga	In	1.592	0.252	Ba	Ba	Zn	Cd	Si	Si	Zr	2.567	0.317	Mg	Mg	Ge	Sn	Al	Al	Ga	3.041	0.829	Be	Be	Mg	Cd	Si	Ge	Ge	Ge	3.516	1.061		
Ba	Ba	Si	Ge	Ga	Ga	In	1.592	0.563	Mg	Sr	Sn	Hf	Al	Al	Al	2.568	0.276	Ba	Ba	Ba	Zn	Si	Si	Ti	Hf	3.041	0.848	Be	Ba	Cd	Cd	Si	Si	Hf	Hf	3.516	0.902	
Ca	Ca	Ge	Ge	Al	Ga	Ga	1.592	0.330	Mg	Zn	Hf	Hf	Ga	In	In	2.568	0.895	Be	Be	Zn	Cd	Ge	Ge	Hf	Hf	3.041	0.509	Mg	Mg	Ti	Ti	Al	Ga	Ga	Y	3.516	0.969	
Sr	Sr	Si	Ge	Ga	Ga	Y	1.592	0.253	Be	Ba	Zn	Zn	Sn	Sn	Hf	2.568	0.656	Ca	Sr	Sr	Cd	Si	Si	Si	Hf	3.041	0.504	Ca	Ca	Sr	Sr	Ge	Ge	Sn	Zr	3.516	1.118	
Mg	Ca	Sn	Sn	Al	Al	Ga	1.593	0.763	Cd	Cd	Zn	Zr	Sc	Sc	Y	2.568	0.583	Mg	Mg	Ge	Zr	Ga	Ga	Ga	Sc	3.041	0.717	Mg	Ca	Ba	Ba	Si	Si	Si	Sn	3.516	0.626	
Mg	Cd	Ge	Hf	In	In	In	1.595	0.714	Ba	Ba	Cd	Cd	Ti	Zr	Hf	2.568	0.805	Zn	Zn	Si	Ti	Al	Ga	Ga	3.041	0.823	Be	Ba	Si	Hf	Sc	Sc	Y	Y	3.516	0.642		
Be	Sr	Sn	Sn	Al	Al	Ga	1.595	0.354	Sr	Sr	Hf	Hf	Al	In	Sc	2.568	0.594	Be	Sr	Zr	Zr	Zr	Al	Al	Sc	3.041	0.865	Mg	Ba	Ba	Ba	Ge	Zr	Zr	Hf	3.516	0.650	
Be	Zn	Ge	Ge	Al	In	In	1.595	0.853	Mg	Zn	Si	Ge	Ga	Ga	Ga	2.568	0.582	Mg	Ba	Zn	Zn	Si	Si	Si	Sn	3.042	1.038	Mg	Mg	Ge	Zr	Ga	Sc	Sc	Sc	3.516	0.861	
Ca	Sr	Ge	Ge	Al	In	In	1.596	0.720	Ba	Ba	Sn	Zr	Zr	Al	Y	Y	2.568	0.993	Be	Mg	Cd	Cd	Ge	Ge	Hf	Hf	3.042	0.912	Be	Ca	Ti	Ti	Al	Al	Sc	Sc	3.516	0.826
Ca	Ca	Ge	Hf	In	In	In	1.596	0.351	Ca	Ca	Ca	Cd	Sn	Sn	Zr	Hf	2.568	0.532	Mg	Ba	Ba	Zn	Si	Si	Ge	Ge	3.042	0.531	Be	Be	Sr	Zn	Ge	Ge	Ti	Ti	3.516	0.728
Ba	Ba	Sn	Ti	Ga	In	In	1.597	0.864	Be	Ca	Ba	Cd	Ge	Ge	Ge	2.569	0.547	Ca	Ca	Si	Ti	Al	Al	Al	Y	3.042	0.548	Be	Zn	Ti	Ti	Ga	Ga	Sc	Sc	3.516	1.007	
Zn	Zn	Sn	Sn	Al	Ga	Ga	1.597	0.721	Ca	Ca	Si	Hf	Ga	Ga	Y	Y	2.569	1.024	Mg	Ca	Zr	Zr	Al	Y	Y	Y	3.042	0.366	Be	Ca	Ca	Zn	Ge	Ge	Ti	Ti	3.516	0.926
Ba	Cd	Si	Si	Ga	Ga	In	1.598	0.351	Mg	Mg	Ca	Cd	Cd	Ge	Ge	Sn	2.569	0.520	Sr	Sr	Zr	Hf	Sc	Sc	Y	Y	3.042	0.158	Mg	Ba	Ba	Ba	Ge	Ti	Hf	Hf	3.516	0.742
Be	Cd	Ge	In	In	Y	Y	1.599	0.925	Ca	Sr	Ti	Ti	Ga	Ga	Y	2.569	0.541	Zn	Cd	Zr	Zr	In	Sc	Sc	Sc	3.043	0.085	Mg	Mg	Sr	Sr	Sn	Sn	Zr	Hf	3.516	0.810	
Sr	Sr	Si	Ge	Ga	Ga	In	1.599	0.803	Be	Sr	Cd	Cd	Ge	Ge	Hf	Hf	2.569	0.887	Sr	Ba	Ti	Zr	Al	Y	Y	Y	3.043	-0.057	Mg	Zn	Zn	Zn	Si	Ge	Zr	Zr	3.516	0.778
Sr	Ba	Sn	Sn	Al	Al	Y	1.599	0.331	Ba	Cd	Hf	Hf	Ga	Ga	Sc	2.569	1.027	Be	Cd	Si	Ge	Y	Y	Y	Y	3.043	0.457	Ca	Ca	Sr	Sr	Ge	Ti	Hf	Hf	3.517	0.709	
Mg	Sr	Cd	Cd	Ge	Sn	Sn	1.599	0.941	Ba	Cd	Ti	Ti	Al	Al	Ga	In	2.569	1.035	Ba	Cd	Ti	Zr	Al	Al	Al	Al	3.043	0.365	Ca	Ca	Sr	Ba	Si	Si	Hf	Hf	3.517	0.963
Zn	Cd	Si	Si	Ga	In	In	1.599	0.803	Sr	Cd	Cd	Cd	Ge	Zr	Hf	Hf	2.570	1.052	Cd	Cd	Zr	Hf	Sc	Sc	Sc	Y	3.043	0.033	Be	Cd	Ti	Ti	Al	Al	Sc	Sc	3.517	0.895
Cd	Cd	Ge	Ti	In	In	In	1.600	0.326	Be	Be	Sr	Zn	Si	Si	Sn	Sn	2.570	0.984	Ca	Ba	Zn	Zn	Si	Si	Si	Ge	3.043	0.160	Mg	Mg	Mg	Sr	Sn	Zr	Hf	Hf	3.517	0.759
Ba																																						

Be	Ba	Sn	Sn	Al	Sc	Sc	1.642	0.232	Cd	Cd	Sn	Zr	In	Sc	Sc	Sc	2.578	0.754	Sr	Ba	Ba	Zn	Ge	Ge	Ti	Ti	3.051	0.723	Mg	Mg	Ti	Ti	In	Sc	Sc	Y	3.527	1.119	
Mg	Mg	Sn	Sn	Al	In	Y	1.643	0.325	Ba	Ba	Zn	Zn	Si	Si	Ti	Zr	2.578	0.638	Mg	Mg	Si	HF	Ga	Ga	Y	Y	3.051	0.771	Ca	Ca	Ca	Zn	Si	Ge	Ge	Ti	3.527	1.707	
Be	Mg	Sn	Sn	Ga	In	In	1.643	0.348	Be	Ca	Cd	Cd	Sn	Sn	Ti	Ti	2.578	1.309	Sr	Ba	Zr	Zr	Sc	Sc	Y	Y	3.051	0.600	Ca	Ca	Ca	Ba	Ge	Ti	Zr	Zr	3.527	1.441	
Ca	Zn	Ge	Ti	In	In	In	1.643	0.557	Ba	Ba	Ba	Cd	Si	Si	Sn	Ti	2.578	0.755	Ba	Ba	Zn	Ge	Ti	Sc	Sc	Sc	3.051	0.575	Mg	Ca	Ca	Zn	Sn	Zr	Zr	Zr	3.527	1.175	
Ca	Cr	Ge	Zr	In	In	In	1.643	0.305	Sr	Sr	HF	HF	Al	Al	Ga	In	2.578	0.636	Mg	Cd	Cd	Cd	Si	Ge	HF	HF	3.051	0.448	Ca	Sr	Sr	Sr	Ti	Zr	Zr	HF	3.527	0.775	
Cd	Cd	Sn	Ge	Al	Ga	Ga	1.644	0.338	Sr	Sr	Ti	Ti	Al	Al	In	Y	2.578	1.012	Be	Ba	Ti	Ti	Al	Al	Al	Ga	3.051	0.254	Ca	Ba	Ba	Ba	Ge	Sn	Sn	Ti	3.527	0.743	
Mg	Sr	Ge	Ge	Al	Ga	Ga	1.646	0.542	Mg	Ba	Ba	Zr	Zr	Al	Y	Y	2.578	1.103	Be	Mg	Ti	Ti	Al	Al	In	In	3.051	0.907	Be	Be	Si	Ti	Al	Y	Y	Y	3.527	0.977	
Sr	Sr	Al	Al	Al	Sc	Sc	Y	1.647	0.367	Mg	Ca	Ca	Zn	Ge	Sn	Sn	2.578	1.070	Be	Mg	Mg	Zn	Ge	Ge	Sn	Sn	3.051	0.740	Be	Sr	Ba	Ba	Si	Si	Si	Ge	3.527	0.806	
Ca	Ca	Ge	Ge	Ga	In	Sc	1.648	0.373	Ca	Ca	Sn	Zr	In	Sc	Sc	Sc	2.578	1.269	Ba	Ba	Ba	Zn	Si	Zr	HF	HF	3.051	0.355	Mg	Mg	Zr	HF	Ga	Ga	Sc	Sc	3.528	0.719	
Be	Ca	Sn	Zr	In	In	In	1.648	0.516	Sr	Sr	Sn	HF	Sc	Sc	Y	Y	2.579	1.137	Mg	Cd	Cd	Cd	Ge	Sn	Ti	Ti	3.051	0.345	Ca	Cd	Ti	Zr	Sc	Sc	Sc	Sc	3.528	1.028	
Cd	Cd	Ge	HF	In	In	In	1.648	0.194	Mg	Mg	Si	Si	Ga	In	In	Y	2.579	1.063	Ca	Ca	HF	HF	Al	Sc	Y	Y	3.052	0.390	Mg	Sr	Sr	Sr	Ge	Sn	Sn	Ti	3.528	1.814	
Zn	Zn	Ge	Ge	Al	In	In	Y	1.648	0.193	Sr	Zn	Zn	Zn	Si	Ge	HF	HF	2.579	1.309	Ca	Zn	Zn	Cd	Si	Ti	Y	Y	3.052	0.140	Mg	Mg	Ba	Zn	Si	Si	HF	HF	3.528	1.681
Mg	Cd	Ge	Zr	In	In	In	1.649	0.138	Mg	Ca	Zr	Zr	Ga	In	In	In	2.579	1.138	Be	Be	Ge	Ti	Ga	Ga	In	In	3.052	0.713	Be	Be	Sn	Zr	Al	Al	Ga	Ga	3.528	1.667	
Mg	Ba	Sn	Sn	Al	Y	Y	1.649	0.042	Ca	Cd	Cd	Cd	Ge	Sn	Ti	Ti	2.579	1.060	Mg	Mg	Ba	Cd	Cd	Si	Si	Sn	3.052	0.746	Ca	Ca	Sr	Zn	Ge	Ti	Ti	Ti	3.528	0.930	
Be	Sr	Sr	Cd	Si	Sn	Sn	1.649	-0.037	Ba	Ba	Si	Si	Al	Al	Y	Y	2.579	1.165	Mg	Mg	Si	Si	Al	In	In	Sc	3.052	0.263	Be	Ba	Zn	Cd	Si	Si	Si	Si	3.528	0.988	
Ca	Zn	Sn	Sn	Al	Al	Y	1.650	-0.135	Be	Sr	Si	Si	Al	Ga	Ga	Ga	2.579	1.009	Sr	Ba	Si	Si	Al	Al	Y	Y	3.052	1.081	Ca	Ca	Sr	Ba	Si	Zr	Zr	Zr	3.528	1.432	
Sr	Zn	Si	Si	Ga	In	In	1.651	0.106	Mg	Zn	Ge	Ge	Zr	Y	Y	Y	2.580	0.892	Ca	Sr	Zr	Zr	Al	Al	Al	Ga	3.052	1.031	Be	Sr	Ba	Zn	Si	Si	Si	Si	3.529	0.989	
Sr	Sr	Sn	Sn	Ga	Sc	Y	1.651	0.135	Be	Cd	Ge	Zr	Ga	Y	Y	Y	2.580	1.208	Mg	Sr	Sr	Zn	Si	Ge	Ge	Ge	3.052	0.825	Be	Mg	Mg	Ca	Ge	Ge	Sn	Sn	3.529	0.963	
Ca	Ca	Sn	Sn	Al	Al	Sc	Y	1.653	0.031	Ca	Zn	Zn	Cd	Ge	Ge	Zr	2.580	1.013	Ba	Ba	Ba	Bn	Zn	Ge	Zr	HF	3.052	0.514	Mg	Mg	Ba	Cd	Si	Si	Si	Ti	3.529	1.461	
Sr	Cd	Si	Si	In	In	In	1.653	-0.031	Cd	Cd	Ge	HF	Ga	Y	Y	Y	2.580	0.891	Zn	Zn	Sn	Zr	Ge	Zr	Al	Al	Sc	3.052	0.645	Be	Mg	Zn	Zn	Ge	Ge	Ge	Zr	3.529	1.010
Sr	Cd	Sn	Sn	Al	Sc	Sc	1.653	0.107	Mg	Ba	Ba	Zr	Zr	Ga	Ga	Y	2.580	1.180	Be	Cd	HF	HF	Ga	Ga	Ga	Y	3.052	0.547	Be	Be	Ba	Ba	Ge	Ge	Ti	Zr	3.529	1.272	
Ba	Ba	Cd	Cd	Si	Ge	Ge	1.654	0.004	Be	Ca	Ge	HF	Ga	Ga	Ga	Y	2.580	1.157	Ba	Ba	Ba	Zn	Si	Si	Ti	Zr	3.052	0.882	Be	Be	Si	Ti	In	In	Sc	Sc	3.529	1.710	
Be	Mg	Sn	Sn	In	In	In	1.654	-0.057	Cr	Sr	Ge	Zr	In	Y	Y	Y	2.580	1.140	Be	Ca	Cd	Cd	Ge	HF	HF	HF	3.052	0.976	Mg	Sr	Ba	Ba	Si	Si	Ge	Ge	3.529	1.046	
Be	Sr	Sr	Cd	Ge	Sn	Sn	1.654	0.101	Ca	Sr	Cd	Cd	Si	Si	HF	HF	2.580	0.596	Cd	Cd	Si	Zr	Al	Al	Y	Y	3.052	0.631	Be	Be	Be	Cd	Si	Si	Ti	Ti	3.529	1.243	
Sr	Zn	Ge	Ge	Ga	Ga	Sc	1.654	-0.002	Sr	Sr	Si	Cd	Al	Al	Ga	Ga	2.580	0.900	Mg	Ca	Ca	Cd	Sn	Zr	Zr	Zr	3.052	0.580	Ca	Sr	Sr	Ba	Si	HF	HF	HF	3.530	1.756	
Cd	Cd	Ge	Sn	Al	Al	In	1.654	0.298	Mg	Sr	Cd	Cd	Si	Si	Sn	2.580	0.535	Mg	Mg	Ba	Cd	Cd	Ti	Ti	Zr	Zr	3.053	0.834	Be	Be	Si	Ti	Al	Al	In	In	3.530	0.686	
Ca	Ca	Zn	Cd	Si	Sn	Sn	1.654	0.387	Sr	Zn	Zn	Cd	Ge	Zr	Zr	2.580	0.649	Ca	Ca	Ca	Zn	Ge	Sn	Sn	Zr	3.053	0.927	Be	Mg	Si	Ge	Y	Y	Y	Y	3.530	0.691		
Ba	Ba	Si	Sn	Al	Al	Ga	1.655	0.091	Sr	Cd	Cd	Cd	Si	Ti	Ti	HF	2.580	0.427	Be	Cd	Ge	Ge	Al	Sc	Sc	3.053	0.918	Be	Be	Ca	Ca	Si	Ti	Zr	Zr	3.530	0.816		
Ba	Ba	Cd	Cd	Si	Sn	HF	1.655	0.170	Ba	Ba	Cd	Cd	Ti	Zr	Zr	HF	2.580	0.403	Mg	Zn	HF	HF	In	In	Sc	Sc	3.053	1.157	Sr	Ba	Ba	Ge	Sn	Sn	Ti	3.530	1.868		
Ca	Cd	Sn	Sn	In	Y	Y	1.655	0.357	Be	Sr	HF	HF	Ga	Ga	In	2.580	0.757	Mg	Cd	Zr	Zr	Ga	Ga	Ga	Y	3.053	1.022	Mg	Mg	Ti	Ti	Al	Ga	Ga	In	3.530	1.728		
Cd	Cd	Ge	HF	Al	Al	In	1.655	0.050	Ca	Sr	Sr	Zn	Si	Si	Sn	2.581	0.683	Ca	Cd	Ge	Ti	Al	Al	Al	Sc	3.053	0.596	Mg	Mg	Ba	Ba	Zn	Zr	HF	HF	3.530	1.505		
Ca	Ca	Ge	Zr	In	In	Y	1.656	0.144	Be	Be	Ca	Ba	Si	Sn	Sn	2.581	0.618	Cd	Mg	Zn	Zn	Si	Sn	HF	HF	3.053	0.764	Mg	Mg	Si	Zr	Al	Y	Y	Y	3.530	2.027		
Ba	Ba	Sn	Sn	Ga	Sc	Y	1.656	0.350	Mg	Ca	Ge	Zr	Ga	Ga	Ga	2.581	0.720	Be	Be	Ge	HF	In	In	Al	Sc	3.053	0.457	Be	Mg	Si	HF	Y	Y	Y	Y	3.530	1.790		
Ba	Ba	Sn	HF	In	In	Sc	1.656	0.041	Mg	Ba	Sn	HF	Sc	Sc	Sc	2.581	0.561	Be	Be	Sr	Zn	Sn	HF	HF	HF	3.053	0.247	Mg	Mg	Zn	Cd	Si	Si	HF	HF	3.531	1.558		
Ba	Ba	Ge	Zr	In	In	In	1.656	0.137	Ca	Ba	HF	HF	Ga	Ga	In	2.581	0.579	Be	Ba	Ba	Zn	Zn	Si	Ge	Ge	Ge	3.053	0.161	Be	Mg	Ge	Ge	Sc	Sc	Sc	Y	3.531	1.183	
Be	Zn	Sn	Sn	Ga	Ga	Y	1.656	0.161	Sr	Zn	Zn	Zn	Si	Si	Ge	Sn	2.581	0.711	Sr	Zn	Si	Si	Al	Al	Ga	3.053	0.029	Ca	Ca	Ca	Sr	Si	Ge	HF	HF	3.531	1.200		
Be	Ca	Sn	Ti	In	In	In	1.657	-0.100	Ca	Ca	Ge	HF	Al	Al	Y	Y	2.582	0.533	Mg	Mg	Cd	Cd	Ge	Ge	Ti	Zr	3.053	0.540	Be	Zn	Zn	Cd	Si	Si	Ge	Ge	3.531	1.391	
Zn	Zn	Sn	Sn	Ga	In	Sc	1.657	0.117	Ca	Sr	Zn	Zn	Sn	Sn	Ti	Ti	2.582	0.570	Ba	Ba	Ba	Ba	Zn	Ti	Zr	Zr	HF	3.054	0.442	Mg	Mg	Sr	Ba	Zr	HF	HF	HF	3.531	1.175
Mg	Ca	Sn	Zr	In	In	In	1.658	0.149	Be	Ca	Ge	HF	In	In	In	Y	2.582	0.765	Mg	Cd	Ti	Ti	Ga	Ga	Ga	Y	3.054	0.125	Mg	Cd	Si	Si	Ga	Sc	Sc	Sc	3.531	1.174	
Sr	Cd	Si	Si	Ga	Ga	In	1.658	-0.117	Sr	Sr	Sr	Cd	Si	Si	Zr	HF	2.582	0.638	Zn	Zn	Ti	Zr	Al	Y	Y	Y	3.054	0.217	Mg	Sr	Sr	Zn	Zr	Zr	HF	HF	3.531	1.434	
Ca	Sr	Ge	Ti	In	In	In	1.658	0.278	Be	Ba	Ba	Cd	Sn	Si	Ti	Ti	2.582	0.587	Mg	Cd	Cd	Sn	HF	Al	Al	Al	3.054	0.274	Ca	Ca	Sr	Sr	Ge	Zr	HF	HF	3.531	2.124	
Cd	Cd	Ge	Ge	Al	Al	In	Y	1.659	0.281	Sr	Sr	Zr	HF	Ga	Ga	Y	2.582	0.867	Ca	Ca	Ge	Zr	Al	Al	Sc	Sc	3.054	-0.009	Mg	Sr	Ba	Ba	Ti	Ti	HF	HF	3.531	2.013	
Sr	Zn	Ge	Ge	Al	Al	Ga	1.659	-0.146	Mg	Cd	HF	HF	In	In	In	Sc	2.582	0.904	Ca	Ba	Ti	HF	Al	Al	Al	Al	3.055	0.591	Be	Mg	Ti	Ti	Ga	Ga	Ga	In	3.531	1.992	
Sr	Ba	Si	Si	In	In	In	Y	1.660	0.361	Mg	Ca	Cd	Cd	Ge	Ge	Zr	2.583	0.839	Ca	Cd	Si	Ge	Y	Y	Y	Y	3.055	0.649	Be	Ca	Ca	Sr	Sn	Sn	Sn	Zr	3.532	1.328	
Sr	Sr	Ge	Zr	In	In	In	Sc	1.660	0.450	Be	Zn	Sn	Sn	Al	Al	Sc	2.583	0.813	Mg	Mg	Ge	Ge	Al	Al	Ga	Sc	3.055	0.133	Sr	Ba	Ba	Ba	Ge	Sn	Zr	3.532	1.426		
Cd	Cd	Si	HF	Ga	In	In	1.661	0.256	Mg	Cd	Cd	Cd	Ge	Ge	Sn	HF	2.583	0.766	Be	Be	Cd	Cd	Sn	Ti	Zr	Zr	3.055	0.660	Be	Be	Si	Sn	Al	Al	Ga	Ga	3.532	1.788	
Sr	Zn	Si	Zr	In	In	In	1.661	0.221	Ca	Ca																													

Sr	Cd	Ge	Ge	Ga	Sc	Sc	1.696	0.076	Sr	Zn	Zr	Zr	Ga	Ga	Y	2.594	0.276	Sr	Zn	Ti	Ti	Al	Al	Al	In	3.062	0.580	Be	Be	Sr	Sr	Si	Sn	Ti	Ti	3.542	1.154		
Ba	Ba	Ge	Ge	Ga	Sc	Y	1.697	0.076	Be	Sr	Si	Zr	Ga	Ga	Ga	2.594	0.575	Sr	Ba	Ba	Cd	Si	Si	Ge	Ge	3.062	0.266	Be	Be	Be	Mg	Ge	Ge	Sn	HF	3.542	1.070		
Mg	Sr	Sn	Sn	Al	Al	Sc	1.697	-0.005	Sr	Zn	Ge	Ge	Sc	Sc	Y	2.594	0.422	Mg	Ca	Ca	Cd	Ge	Zr	Zr	3.062	0.328	Mg	Be	Be	Mg	Ge	Ge	Sn	HF	3.542	0.995			
Be	Sr	Si	Si	In	In	In	1.697	0.059	Ca	Ba	Cd	Cd	Sn	HF	HF	2.594	0.349	Mg	Cd	HF	HF	Al	Al	Ga	Ga	3.062	0.424	Sr	Ba	Ba	Ba	Si	Ge	Ti	Ti	3.543	1.238		
Ba	Ba	Sn	HF	Ga	Ga	In	1.698	0.053	Be	Be	Ge	Ge	In	In	Sc	Y	2.594	0.622	Ca	Ca	Sr	Cd	Zr	HF	HF	3.062	0.132	Mg	Mg	Mg	Ba	Sn	Ti	Ti	Zr	3.543	1.165		
Ca	Ba	Cd	Cd	Si	Si	Sn	1.698	-0.080	Be	Ca	Ti	Ti	In	In	In	Sc	2.594	0.512	Be	Be	Sr	Cd	Si	Si	HF	HF	3.062	0.668	Ca	Sr	Sr	Sr	Ge	Sn	Ti	Ti	3.543	1.088	
Ba	Ba	Cd	Cd	Ge	Sn	HF	1.698	0.529	Be	Be	Be	Be	Ge	Ge	Sn	Sn	2.594	0.547	Mg	Mg	Ba	Zn	Si	Ge	Ge	Sn	3.062	0.791	Be	Be	Ge	Ge	Al	Ga	Sc	3.543	1.097		
Sr	Sr	Ge	Ge	Ga	Sc	Y	1.699	0.475	Mg	Zn	Sn	Sn	Sc	Sc	Y	Y	2.595	0.631	Zn	Zn	Cd	Cd	Ge	Ti	HF	HF	3.062	0.266	Zn	Zn	Si	HF	Al	Sc	Sc	3.543	1.004		
Be	Ca	Sn	Sn	Al	Al	Ga	1.699	0.379	Sr	Sr	Si	Sn	Sc	Sc	Y	Y	2.595	0.339	Sr	Zn	Zr	Zr	Al	Al	Sc	3.062	0.775	Mg	Mg	Mg	Ba	Ge	Ti	HF	HF	3.543	1.028		
Mg	Ca	Sn	Sn	Al	Al	In	1.699	0.848	Be	Ca	Ca	Cd	Sn	Sn	Zr	Zr	2.595	0.507	Ba	Cd	Zr	Zr	Sc	Sc	Sc	Y	3.063	0.764	Sr	Ba	Ba	Ge	Ti	Zr	3.543	1.235			
Mg	Ca	Sn	Sc	Ge	Ga	Y	1.700	0.731	Sr	Cd	Cd	Cd	Ge	Ti	Ti	Zr	2.595	0.630	Mg	Zn	Cd	Cd	Ge	Ge	HF	HF	3.063	0.564	Be	Ca	Ca	Ba	Sn	HF	HF	3.543	1.069		
Sr	Zn	Cd	Cd	Ge	Ga	Sn	1.700	0.628	Zn	Zn	Si	HF	Ga	Ga	In	2.595	0.305	Be	Ba	Ba	Zn	Si	Si	Zr	Zr	3.063	0.415	Be	Zn	Zr	Zr	Ga	Ga	Sc	3.544	1.042			
Ba	Ba	Zn	Cd	Sn	Sn	HF	1.700	0.746	Ca	Sr	Cd	Cd	Ti	Ti	HF	HF	2.595	0.498	Ca	Ca	Ca	Cd	Si	Si	Ti	Zr	3.063	0.558	Be	Mg	Sr	Sr	Si	Si	Ge	Ge	3.544	1.116	
Zn	Zn	Sn	HF	In	In	In	1.701	0.713	Mg	Zn	Zr	Zr	In	In	Y	Y	2.595	0.663	Be	Be	Be	Sr	Si	Sn	Zr	Zr	3.063	0.364	Be	Be	Be	Ca	Ge	Ti	HF	3.544	1.163		
Zn	Zn	Si	Ge	Ga	Ga	In	1.701	0.610	Cd	Cd	Zr	Zr	Al	Al	In	Sc	2.595	0.776	Mg	Ba	Si	Si	Al	Y	Y	Y	3.063	0.758	Ca	Ca	Ca	Ba	Sn	Ti	HF	3.544	1.255		
Sr	Sr	Si	Ti	Ga	Ga	Ga	1.701	0.721	Cd	Cd	Zr	Ti	HF	Ga	Ga	Y	2.595	0.852	Mg	Ca	Cd	Cd	Ti	Ti	HF	HF	3.063	0.898	Sr	Sr	Ba	Ba	Ge	Ti	Zr	3.544	1.233		
Ba	Ba	Ge	Ge	Al	Al	In	1.702	0.707	Ca	Ca	Ti	Ti	Ga	In	Y	Y	2.595	0.656	Mg	Cd	Si	Si	Al	Al	Ga	Ga	3.063	0.459	Zn	Cd	Si	Si	Sc	Sc	Sc	Y	3.544	1.225	
Sr	Ba	Ge	Ge	Al	Al	Ga	1.702	0.604	Ca	Sr	Zr	Zr	Ga	Ga	In	In	2.596	0.613	Mg	Sr	Ti	Ti	Al	Al	Y	Y	3.063	0.457	Mg	Mg	Zr	Zr	Al	Al	Ga	In	3.544	1.284	
Sr	Sr	Si	Ge	In	In	Y	1.703	0.971	Zn	Zn	Sn	Zn	Ge	Y	Y	Y	2.596	0.810	Mg	Sr	Si	Ge	Sc	Sc	Sc	Sc	3.063	0.680	Be	Cd	Ti	Ti	Al	Sc	Sc	Sc	3.544	1.010	
Sr	Zn	Zn	Cd	Sn	Sn	Zr	1.704	0.904	Ba	Ba	Zn	Zn	Ge	Ge	Ti	HF	2.596	0.654	Be	Sr	Zr	Zr	Al	Al	Al	Y	3.063	0.675	Ca	Ba	Ba	Si	Sn	Sn	Ti	3.544	1.032		
Be	Ba	Si	Zr	In	In	In	1.705	0.664	Sr	Ba	Ba	Cd	Ti	Ti	HF	HF	2.596	0.580	Mg	Sr	Cd	Cd	Ti	Ti	HF	3.063	0.770	Mg	Ba	Ba	Ba	Ti	Zr	HF	HF	3.544	1.036		
Mg	Mg	Si	Sn	Ga	In	In	1.705	0.873	Mg	Mg	Zn	Cd	Cd	Sn	Sn	Zr	2.596	0.800	Ca	Sr	Sr	Zn	Si	Si	Sn	3.064	1.013	Zn	Cd	Si	Zr	Al	Al	Al	3.544	1.272			
Sr	Sr	Sn	HF	Ga	Ga	In	1.705	0.885	Mg	Sr	HF	HF	Ga	Y	Y	Y	2.596	0.430	Ba	Cd	Si	Si	Sc	Sc	Y	Y	3.064	0.781	Mg	Ba	Ba	Ba	Si	Ge	HF	HF	3.544	1.149	
Be	Sr	Sn	Sn	Al	Al	Sc	1.705	0.634	Ca	Sr	Si	HF	Ti	Ga	Y	Ga	2.597	0.539	Be	Mg	Zr	Si	Si	Sc	Y	Y	3.064	0.580	Mg	Mg	Sr	Ba	Ge	Ge	HF	3.544	0.891		
Sr	Cd	Cd	Cd	Si	Sn	Sn	1.705	0.848	Ca	Ca	Sr	Cd	Sn	Sn	Sn	Ti	2.597	0.437	Mg	Mg	Si	HF	Al	Al	In	In	3.064	0.660	Be	Sr	Ca	Ba	Sn	Zr	Zr	3.545	1.449		
Cd	Cd	Ge	Zr	In	In	In	1.705	0.879	Mg	Ba	Ba	Zn	Ge	Ge	Ge	Sn	2.597	0.543	Mg	Sr	Ba	Ba	Si	Si	Sn	Sn	3.064	0.478	Ca	Sr	Ca	Ba	Si	Si	Ge	Sn	3.545	1.194	
Sr	Ba	Cd	Cd	Sn	Sn	HF	1.705	0.626	Sr	Zn	Zn	Cd	Ti	Zr	Zr	Zr	2.597	0.411	Mg	Mg	Sr	Cd	Ge	HF	HF	HF	3.064	0.449	Be	Ca	Ba	Sn	HF	HF	HF	3.545	0.940		
Be	Mg	Si	Sn	In	In	In	1.705	0.714	Be	Be	Ba	Ba	Zn	Sn	Sn	Ti	2.597	0.424	Zn	Cd	HF	HF	Ga	Sc	Sc	3.064	0.391	Mg	Mg	Mg	Ba	Si	Ge	HF	3.545	0.604			
Ca	Sr	Si	Si	In	In	In	1.705	0.732	Ca	Sr	HF	HF	Al	Al	In	In	2.597	0.547	Be	Be	Be	Cd	Ge	Ti	Ti	HF	3.064	0.309	Mg	Sr	Sr	Sr	Si	Ti	Zr	3.545	0.523		
Be	Sr	Ge	Ge	Ga	Ga	Y	1.706	0.657	Mg	Zn	HF	HF	Al	In	In	In	2.597	0.530	Be	Ba	Ba	Cd	Ge	Ti	Ti	HF	3.064	0.686	Mg	Mg	Mg	Zn	Si	Si	Sn	Zr	3.545	0.763	
Cd	Cd	Ge	HF	In	In	Y	1.706	0.693	Cd	Cd	Si	Ge	In	Sc	Sc	Sc	2.598	0.529	Ca	Sr	Zr	Zr	Al	Al	Sc	Sc	3.064	0.651	Mg	Sr	Ba	Ba	Ge	Zr	Zr	3.545	0.667		
Mg	Ba	Ge	Ge	Ga	Y	Y	1.707	0.720	Be	Sr	Sn	HF	Sc	Sc	Sc	Sc	2.598	0.817	Be	Ca	Cd	Cd	Ge	Zr	Zr	3.064	0.394	Zn	Zn	Si	Ti	Sc	Sc	Y	Y	3.545	0.499		
Cd	Cd	Sn	Sn	Ga	Y	Y	1.707	0.640	Be	Ba	Zn	Zn	Ge	Sn	Sn	Zr	2.598	0.725	Sr	Sr	Zn	Zn	Ge	Ge	Ti	HF	3.065	0.516	Be	Be	Zn	Zn	Ge	Ti	Ti	3.546	0.818		
Ba	Ba	Sn	HF	Ga	Ga	Sc	1.707	0.736	Be	Sr	Si	Si	Ga	Y	Y	Y	2.598	0.755	Sr	Ba	Ba	Zn	Si	HF	HF	HF	3.065	0.615	Sr	Sr	Sr	Ba	Ge	Ti	Ti	HF	3.546	1.541	
Ca	Ca	Sn	HF	Ga	Ga	In	1.708	0.741	Ca	Ba	Si	Ge	Al	Al	Al	Al	2.598	0.865	Be	Be	Ca	Cd	Ge	Ge	HF	HF	3.065	0.317	Be	Sr	Zn	Zn	Si	HF	HF	HF	3.546	1.395	
Sr	Sr	Cd	Cd	Si	Sn	HF	1.708	0.630	Zn	Zn	Cd	Cd	Si	Si	Sn	HF	2.598	0.659	Ca	Ca	Zr	HF	Al	Al	Ga	Ga	3.065	0.830	Be	Ba	Ba	Zn	Ti	Ti	HF	HF	3.546	1.388	
Cd	Cd	Si	Ti	Ga	Ga	In	1.708	1.111	Ca	Cd	Cd	Cd	Ge	Ge	Ti	HF	2.598	0.621	Ca	Ba	Ti	Ti	Ga	Sc	Sc	Sc	3.065	0.967	Be	Ba	Ba	Ba	Ge	Zr	HF	HF	3.546	0.747	
Be	Ba	Ba	Cd	Ge	Ge	Sn	1.709	1.044	Zn	Zn	Cd	Cd	Ge	Ge	Sn	Ti	2.599	0.982	Sr	Ba	Ba	Ba	Sn	HF	HF	HF	3.065	0.449	Be	Be	Ca	Zn	Si	Si	Zr	Zr	3.546	0.728	
Sr	Sr	Ge	HF	Ga	Ga	In	1.709	0.906	Zn	Zn	Zr	Zr	HF	In	In	In	2.599	0.923	Sr	Sr	Sr	Zn	Si	Ge	Ge	HF	3.065	0.764	Mg	Ca	Ge	Ti	Sc	Sc	Sc	Sc	3.546	1.175	
Ca	Zn	Ge	Ge	Ga	Ga	Y	1.709	1.003	Be	Be	Sn	Sn	Al	Sc	Sc	Y	Y	2.599	0.853	Sr	Ba	Ba	Ba	Zn	Ti	Zr	Zr	3.066	0.773	Mg	Mg	Mg	Cd	Si	Ti	Ti	Zr	3.547	0.839
Ba	Ba	Cd	Cd	Ge	Sn	Sn	1.709	1.027	Be	Ba	Zn	Zr	Zr	Al	In	In	In	2.599	0.928	Mg	Sr	Sr	Zn	Ge	Ge	Zr	Zr	3.066	0.587	Ca	Ca	Zn	Sn	Ti	Ti	HF	3.547	0.705	
Mg	Cd	Ge	Ge	Al	Al	In	1.710	0.878	Sr	Cd	Si	Sn	Y	Y	Y	Y	2.599	0.795	Be	Be	Zr	HF	Al	Al	Y	Y	3.066	0.573	Mg	Sr	Ba	Ba	Ge	HF	HF	HF	3.547	1.209	
Cd	Cd	Si	Zr	Ga	In	In	1.710	0.976	Sr	Zn	Zn	Cd	Ti	HF	HF	HF	2.599	0.814	Be	Be	Sn	Ti	Al	Al	In	In	3.066	0.679	Be	Be	Mg	Mg	Ge	Sn	HF	HF	3.547	0.824	
Ba	Ba	Sn	HF	Ga	Ga	Ga	1.711	1.021	Sr	Sr	Zn	Zn	Si	Ge	Ti	Ti	2.599	0.915	Mg	Ca	Ca	Zn	Sn	HF	HF	3.066	0.443	Sr	Ba	Ba	Ba	Si	Si	Sn	HF	3.548	1.020		
Zn	Zn	Sn	Ti	Ga	In	In	1.711	0.869	Ca	Ba	Si	Si	Al	Al	Ga	Ga	2.599	0.766	Be	Mg	Ba	Cd	Cd	Ti	Ti	Ti	3.066	0.888	Mg	Mg	Mg	Ba	Ti	Zr	HF	HF	3.548	1.455	
Ca	Ca	Ge	Sn	Al	Al	Ga	1.712	0.826	Sr	Ba	Zn	Cd	Ti	Ti	Ti	Ti	2.599	0.804	Mg	Cd	Ti	Ti	Ga	Y	Y	Y	3.067	1.003	Mg	Sr	Sr	Zn	Zr	Zr	Zr	HF	3.548	0.893	
Sr	Zn	Sn	Sn	Ga	Y	Y	1.713	0.856	Be	Be	Cd	Cd	Ge	Ge	Sn	Zr	2.599	0.986	Mg	Sr	HF	HF	Al	Sc	Sc	Sc	3.0												

Be	Ba	Si	Si	In	In	In	Sc	1.765	-0.188	Sr	Sr	Ti	Ti	Al	Al	Ga	Y	2.609	0.696	Be	Ba	Ba	Zn	Ge	Ge	Ge	HF	3.074	0.328	Mg	Ca	Ba	Zn	HF	HF	HF	HF	3.558	0.957	
Sr	Zn	Si	Si	Al	In	In	In	1.747	-0.263	Sr	Zn	Zr	Zr	Ga	Ga	Ga	In	2.609	0.505	Ca	Sr	Sr	Ba	Ge	Sn	Sn	Sn	3.074	0.653	Mg	Ca	Si	HF	Al	Al	Al	Al	3.558	1.147	
Be	Ca	Ge	Ge	Ga	Ga	Ga	In	1.748	0.074	Be	Mg	HF	HF	In	In	Y	Y	2.609	0.480	Mg	Mg	Sr	Cd	Sn	Sn	Ti	Ti	3.074	0.659	Mg	Ca	Ba	Ba	Si	Sn	Ti	Ti	3.558	1.137	
Zn	Zn	Ge	Sn	In	In	In	Sc	1.749	0.001	Ca	Cd	Cd	Cd	Si	Ti	Zr	Zr	2.609	0.706	Ca	Sr	Ti	Ti	Al	Al	Y	Y	3.074	0.458	Sr	Sr	Ba	Ba	Si	Ge	Ti	Ti	3.558	0.985	
Ba	Ba	Sn	Zn	Ga	In	Ga	In	1.750	-0.077	Cd	Cd	Si	Ge	Al	Al	Al	Ga	2.609	0.349	Be	Sr	Zr	HF	Sc	Sc	Sc	Sc	3.075	0.541	Mg	Sr	Sr	Ba	Sr	Ge	Sn	Sr	3.558	1.173	
Mg	Cd	Sn	Sn	In	Y	Y	Y	1.750	-0.004	Ca	Ba	Zr	Zr	Al	Al	In	In	2.610	0.431	Be	Ge	Ti	In	Y	Y	Y	Y	3.075	0.543	Mg	Ba	Ba	Ba	Ti	Zr	Zr	HF	3.558	1.064	
Cd	Sn	Ge	Ge	Al	In	In	In	1.750	-0.010	Zn	Zn	Sn	Ti	In	Y	Y	Y	2.610	0.705	Mg	Ca	Ba	Ba	Si	Si	Sn	Sn	3.075	0.311	Mg	Ba	Ba	Ba	Zn	Ti	Ti	HF	3.558	1.177	
Zn	Zn	Ge	Sn	Ga	Ga	Ga	Y	1.750	-0.086	Zn	Cd	Cd	Cd	Si	Si	Sn	HF	2.610	0.318	Mg	Ba	Si	Si	Al	Al	Al	HF	3.075	0.875	Mg	Mg	Sr	Zn	Ti	Ti	Zr	Zr	3.558	1.398	
Sr	Sr	Cd	Cd	Sn	Sn	Sr	HF	1.751	-0.023	Sr	Cd	Ge	Ge	Sc	Y	Y	Y	2.610	0.420	Be	Be	Be	Zn	Ge	Zr	HF	HF	3.075	0.847	Mg	Mg	Ca	Sr	Sn	Sn	HF	HF	3.558	1.158	
Be	Ca	Sr	Cd	Sn	Sn	Sn	Sn	1.751	-0.014	HF	HF	HF	HF	Ga	Sc	Y	Y	2.610	0.694	Be	Sr	Ba	Ba	Ge	Ge	Ge	Sn	3.075	0.376	Al	Ga	Ga	In	Sc	Y	Y	Y	3.558	1.202	
Zn	Zn	Sn	HF	Ga	Ga	Ga	In	1.751	-0.089	Ca	Zn	Ge	Ge	Al	Al	Sc	Sc	2.610	0.550	Be	Ba	Ti	Zr	Sc	Sc	Sc	Sc	3.075	0.546	Ca	Ca	Ca	Zn	Ge	Ti	HF	HF	3.558	1.441	
Sr	Ba	Sn	Sn	Al	Sc	Sc	Sc	1.751	0.248	Sr	Sr	HF	HF	Al	Ga	Sc	Sc	2.610	0.475	Ca	Ca	Ti	HF	In	Sc	Sc	Sc	3.075	0.614	Mg	Mg	Ba	Ba	Si	Sn	HF	HF	3.559	0.878	
Be	Cd	Ge	Ti	In	In	In	In	1.752	0.236	Sr	Sr	Sr	Cd	Ge	Ge	Sn	Ti	2.610	0.756	Ca	Sr	Si	Zr	Al	Al	Al	Al	3.075	0.571	Mg	Ca	Ba	Ba	Ti	Ti	HF	HF	3.559	0.885	
Cd	Cd	Cd	Cd	In	Sn	Sn	Zr	1.754	-0.022	Sr	Cd	Si	Sn	Sc	Sc	Sc	Sc	2.610	0.655	Ca	Sr	Zn	Cd	Si	Si	Si	Si	3.075	0.852	Mg	Zn	Ti	Ti	Al	Al	Ga	Ga	3.559	0.947	
Ca	Ca	Si	Sn	Al	Al	Al	In	1.755	0.174	Ba	Ba	Zr	HF	Ga	Ga	Sc	Sc	2.610	0.689	Be	Be	Zr	HF	Al	In	In	In	3.075	0.911	Ca	Ca	Ca	Sr	Ge	Zr	Zr	Zr	3.559	1.170	
Ba	Ba	Ge	HF	Ga	Ga	Ga	Y	1.755	0.220	Be	Ca	Ba	Zn	Ge	Ge	Sn	Sn	2.611	0.746	Mg	Ba	Ge	Ti	Y	Y	Y	Y	3.076	0.647	Be	Be	Si	Zr	Ga	Ga	Ge	Y	3.559	1.137	
Ba	Ba	Si	Sn	Al	Al	Al	Y	1.755	-0.047	Ca	Cd	Zr	Zr	Ga	Ga	Ga	In	2.611	0.646	Ba	Cd	Ti	Ti	Ga	Sc	Sc	Sc	3.076	0.709	Be	Sr	Sr	Sr	Ge	Sn	Ti	Ti	3.559	1.045	
Ca	Cd	Cd	Cd	Si	Ge	Sn	Sn	1.755	0.155	Sr	Cd	Cd	Cd	Si	Zr	HF	HF	2.611	0.479	Ca	Ca	Sr	Zn	Ge	Ge	Ge	Ge	3.076	0.765	Mg	Mg	Ge	Zr	Sc	Sc	Sc	Y	3.559	1.296	
Sr	Ba	Cd	Cd	Ge	Ge	Ge	Sn	1.756	0.215	Be	Mg	Ge	Ge	Al	Al	In	In	2.611	0.742	Mg	Ba	Ba	Ba	Zn	Ge	Ge	Ge	Ti	3.076	0.583	Be	Be	Be	Ca	Ge	Ge	Zr	HF	3.559	1.198
Ba	Ba	Si	Ge	In	In	In	Sc	1.756	-0.052	Cd	Cd	Cd	HF	In	Y	Y	Y	2.611	0.441	Be	Be	Be	Sr	Ge	Ti	Zr	HF	HF	3.076	0.445	Mg	Mg	Ba	Ba	Ge	Sn	Zr	Zr	3.559	1.050
Cd	Cd	Sn	Sn	Al	Sc	Y	Y	1.756	0.190	Sr	Ba	Ba	Cd	Ge	HF	HF	HF	2.611	0.640	Ca	Zn	Zn	Zn	Sn	Ti	Zr	Zr	3.076	0.430	Mg	Ba	Ba	Ba	Si	Sn	Sn	HF	3.559	1.091	
Sr	Sr	Cd	Cd	Sn	Sn	Sn	HF	1.756	0.182	Sr	Cd	Sn	HF	Y	Y	Y	Y	2.611	0.800	Mg	Ca	Zr	Zr	Zr	Al	Al	Y	Y	3.076	0.330	Mg	Mg	Si	Ge	Sc	Y	Y	Y	3.560	1.038
Ba	Zn	Cd	Cd	Sn	Sn	Sn	Ti	1.756	-0.085	Sr	Sr	HF	HF	Ga	Ga	Ga	Y	2.611	0.910	Be	Be	Ge	Ti	In	In	In	Sc	3.076	0.648	Mg	Mg	Sr	Zn	Si	Si	Sn	Sn	3.560	1.030	
Mg	Sr	Si	Si	Sn	Ga	In	In	1.757	0.177	Ca	Sr	Zn	Cd	Si	Si	Si	Ti	2.611	0.990	Ba	Ba	Zn	Si	HF	Sc	Sc	Sc	3.076	0.664	Be	Cd	HF	HF	Al	Al	Al	Sc	3.560	1.188	
Ca	Ba	Ge	Ge	Al	Al	Ga	Ga	1.757	0.172	Be	Be	Ba	Ba	Ge	Sn	Sn	Ga	2.611	0.776	Mg	Mg	Cd	Cd	Sn	Ti	Zr	Zr	3.076	0.370	Mg	Mg	Zn	Cd	Si	Si	Ti	Ti	3.560	1.092	
Sr	Ba	Si	Ge	Ga	Ga	Ga	Ga	1.757	-0.100	Ca	Ca	Ba	Ti	HF	Ga	Ga	Ga	2.611	0.741	Ca	Ca	Ca	Cd	Si	Si	Ge	Zr	3.076	0.556	Mg	Mg	Mg	Cd	Si	Si	Ge	Ge	Ti	3.560	1.063
Mg	Ca	Cd	Cd	Ge	Sn	Sn	Sn	1.757	0.329	Ca	Ba	Ti	Ti	Al	Al	In	In	2.612	0.948	Cd	Cd	Ti	Zr	Sc	Y	Y	Y	3.076	0.594	Zn	Zn	Ti	Zr	Al	Al	Al	Ga	3.560	1.315	
Zn	Zn	Sn	Zr	In	In	In	Y	1.758	0.329	Mg	Ca	Si	Si	In	In	Sc	Sc	2.612	0.769	Be	Be	Si	HF	Ga	Y	Y	Y	3.076	0.287	Mg	Zn	Zn	Zn	Si	Sn	Ti	Ti	3.560	1.231	
Sr	Cd	Sn	Ti	Ga	Ga	Ga	Ga	1.758	-0.088	Ba	Ba	Ba	Cd	Ge	Zr	Zr	HF	2.612	0.706	Be	Be	Sn	HF	Ga	Ga	Ga	In	3.077	0.866	Mg	Sr	Sr	Sr	Ge	Sn	Sn	HF	3.560	1.167	
Ca	Cd	Sn	Ga	Ga	Y	Y	Y	1.759	0.310	Be	Cd	Ge	Ge	Al	Al	Al	In	2.612	0.937	Mg	Mg	Mg	Cd	Sn	Ti	Ti	Zr	3.077	0.900	Mg	Ca	Si	HF	Sc	Sc	Sc	Sc	3.560	1.152	
Ca	Ca	Sn	Zr	In	In	Y	Y	1.759	0.304	Ca	Sr	Sn	Ti	Al	Al	Al	Al	2.612	0.660	Be	Mg	Ba	Ba	Sn	Sn	HF	HF	3.077	0.367	Be	Ca	Ba	Ba	Sn	Ti	Ti	Ti	3.561	1.056	
Sr	Sn	Zr	Ga	Ga	Ga	In	Y	1.759	0.122	Be	Be	Sr	Zr	Al	Y	Y	Y	2.612	0.562	Zn	Zn	Cd	Ge	Ti	HF	HF	3.077	0.690	Ca	Ca	Ca	Sr	Ge	Ge	Sn	HF	3.561	1.110		
Sr	Cd	Ge	HF	Ga	Ga	Ga	Ga	1.759	0.218	Ba	Zn	Zn	Zn	Sn	Ti	HF	HF	2.612	0.574	Ca	Ca	Zr	Zr	Al	Ga	Sc	Sc	3.077	0.702	Ca	Ba	Ba	Ba	Ge	Sn	HF	HF	3.561	1.278	
Mg	Ca	Cd	Cd	Si	Sn	Sn	Sn	1.760	0.284	Cd	Cd	Ge	HF	Al	Al	Al	Y	2.612	0.661	Zn	Zn	Cd	Ge	Ge	Ti	HF	HF	3.077	0.501	Be	Mg	Mg	Zn	Sn	HF	HF	HF	3.561	1.106	
Be	Ba	Sn	Sn	Sc	Y	Y	Y	1.760	0.091	Sr	Sr	Zn	Zn	Cd	Si	HF	HF	2.612	0.541	Sr	Ba	Si	Si	Ge	Al	Al	Al	3.077	0.587	Be	Ba	Ba	Ba	Ge	Zr	Zr	HF	3.561	1.126	
Cd	Cd	Si	Ti	Al	Al	In	In	1.760	0.197	Ca	Sr	Cd	Cd	Si	Si	Si	Ge	2.612	0.560	Be	Be	Cd	Cd	Ge	Ti	HF	HF	3.077	0.574	Mg	Mg	Sr	Ba	Ge	Ge	Ge	Zr	3.561	1.175	
Ba	Ba	Si	Sn	Al	Al	Al	In	1.761	0.279	Sr	Zn	Cd	Cd	Si	Si	HF	HF	2.612	0.665	Mg	Mg	Si	Ge	Ga	Ga	Sc	Sc	3.077	0.352	Ca	Ca	Sr	Sr	Sn	Ti	Ti	HF	3.561	1.228	
Sr	Sr	Si	Sn	Ga	Ga	Ga	Y	1.761	0.084	Ba	Ba	Ba	Cd	Si	Ge	Ge	HF	2.612	0.650	Be	Mg	HF	HF	Ga	Ga	In	In	3.077	0.901	Be	Be	Be	Be	Si	Sn	Zr	HF	3.561	1.351	
Be	Ca	Sn	Sn	In	Sc	Sc	Sc	1.761	0.213	Be	Mg	Sr	Ba	Sn	Sn	Sn	Sn	2.613	0.650	Zn	Zn	Ti	Zr	Al	Ga	Ga	Ga	3.077	0.854	Be	Mg	Sn	Zr	Sc	Sc	Sc	Sc	3.561	1.281	
Ba	Zn	Zn	Cd	Si	Si	Sn	Sn	1.761	0.218	Ba	Ba	Ba	Cd	Zr	Zr	Zr	HF	2.613	0.280	Ba	Zn	Ti	Ti	In	Sc	Sc	Sc	3.077	0.396	Mg	Mg	Sr	Sr	Sn	Sn	Ti	HF	3.561	1.275	
Ba	Cd	Ge	Ge	Al	Al	Al	In	1.762	0.035	Sr	Cd	Si	Si	In	Y	Y	Y	2.613	0.158	Ba	Zn	Zr	Zr	Zr	Sc	Sc	Y	Y	3.077	0.566	Be	Be	Ba	Ba	Si	Ge	HF	HF	3.562	1.369
Ba	Cd	Cd	Cd	Ge	Ge	Sn	Zr	1.762	0.196	Mg	Mg	Ba	Cd	Sn	Sn	Sn	Ti	2.613	0.233	Ca	Ba	Zr	Zr	Zr	Sc	Y	Y	Y	3.077	0.612	Ca	Zn	Ti	Ti	Sc	Y	Y	Y	3.562	1.043
Sr	Sr	Ge	Zr	Ga	In	In	In	1.762	0.208	Be	Be	Be	Zn	Si	Sn	Sn	HF	2.613	0.398	Mg	Mg	Sn	Zr	Zr	Al	Al	Y	Y	3.077	0.578	Be	Be	Sn	Zr	Al	Al	Y	Y	3.562	1.060
Sr	Sr	Sn	Ti	In	In	Y	Y	1.762	0.019	Be	Sr	Cd	Cd	Si	Ge	Ge	Ge	2.613	0.068	Be	Be	Zr	Zr	Ga	In	In	Y	Y	3.078	0.855	Be	Mg	Ge	Ge	Al	Sc	Sc	Sc	3.562	1.083
Ca	Ca	Sn	Zr	In	Ga	In	In	1.762	0.343	Sr	Ba	Cd	Ti	Ti	Al	Al	Ga	Ga	2.613	0.195	Sr	Sr	Sr	Zn	Ge	Ge	Ti	Zr	3.078	0.886	Mg	Ca	Ca	Zn	Ge	Ge				

Mg	Zn	Sn	Zr	In	In	In	In	1.789	0.879	Ca	Ca	Si	Ti	Ga	Ga	In	2.622	0.166	Sr	Zn	Si	Zr	Al	Al	Al	Al	3.086	0.308	Ca	Sr	Sr	Sr	Si	Sn	Ti	Ti	3.571	1.065		
Cd	Cd	Ge	Sn	Al	Al	Al	Y	1.790	0.692	Ba	Ba	Ba	Zr	In	Sn	Sc	Y	2.622	0.166	Ca	Ca	Si	Zr	In	Sc	Sc	Sc	3.086	0.360	Sr	Sr	Sr	Ba	Si	Si	Ti	HF	3.571	0.735	
Ca	Ca	Sn	Ti	Al	In	In	In	1.791	0.956	Be	Be	Be	Be	Zn	Ge	Sn	Sn	2.622	0.220	Sr	Sr	Sr	Sn	Si	Ge	Ge	Zr	3.086	0.310	Mg	Mg	Sr	Sr	Sn	Sn	Ti	Zr	3.571	0.975	
Ca	Cd	Sn	Sn	Al	Al	Al	Sc	1.791	0.868	Mg	Mg	Cd	Cd	Ge	Sn	HF	HF	2.622	0.086	Be	Ba	Ba	Zn	Ge	Ge	Ge	Ti	3.086	0.142	Mg	Mg	Zr	HF	In	Sc	Sc	Sc	3.571	1.105	
Sr	Cd	Ti	HF	In	Al	In	Sn	1.791	1.092	Sr	Zn	Cd	Cd	Si	Zr	Zr	Zr	2.622	0.066	Mg	Mg	Ba	Cd	Ti	Zr	Zr	Zr	3.086	0.368	Be	Ba	Zn	Zn	Ti	Ti	Zr	Zr	3.571	0.446	
Zn	Zn	Ge	HF	Ge	Ge	Ge	In	1.791	1.235	Mg	Ca	Zn	Zn	Sn	Sn	Sn	HF	2.622	0.441	Mg	Zn	Zn	Cd	Ge	Ge	Ge	Zr	3.086	0.524	Mg	Mg	Sr	Ba	Si	Si	Si	Sn	3.572	0.476	
Ba	Ba	Cd	Cd	Ge	Ge	Sn	Zr	1.792	0.988	Mg	Ca	Ca	Cd	Sn	Sn	Sn	HF	2.622	0.080	Ca	Cd	Si	Si	Al	Al	Al	Ga	3.086	0.340	Mg	Mg	Sr	Zn	Ti	HF	HF	HF	3.572	0.368	
Cd	Cd	Ge	HF	Ge	Ga	Ga	In	1.792	0.895	Ca	Zn	Zr	Zr	Ga	Ga	Y	2.622	0.008	Mg	Mg	Ge	Zr	Ga	Y	Y	Y	3.086	0.556	Be	Ba	Ba	Ba	Si	Sn	Sn	Zr	3.572	1.206		
Be	Ba	Cd	Cd	Ge	Ge	Sn	Sn	1.792	1.186	Ca	Ba	Cd	Cd	Ge	Ti	Ti	2.622	0.280	Mg	Mg	Ge	Sn	Al	Sc	Sc	Sc	3.086	0.638	Be	Be	Be	Ca	Ge	Ti	Zr	Zr	3.572	1.062		
Ca	Ca	Sn	Ti	Al	In	In	In	1.793	0.929	Be	Ba	HF	HF	Al	Al	Y	2.622	-0.018	Be	Sr	Sr	Zn	Sn	HF	HF	HF	3.086	0.113	Mg	Mg	Mg	Sr	Sn	Ti	Zr	Zr	3.572	0.824		
Sr	Sr	Sn	Ti	Ga	Ga	Ga	In	1.794	0.857	Be	Be	Be	Cd	Ge	Ge	Sn	Zr	2.623	0.003	Ca	Ca	Zr	HF	Al	Y	Y	In	3.086	0.171	Ca	Ca	Ca	Zn	Ti	Zr	Zr	HF	3.572	1.478	
Zn	Zn	Sn	Sn	Al	In	Sc	Sc	1.794	1.175	Sr	Sr	HF	HF	In	Sc	Sc	Y	2.623	0.402	Mg	Ba	Ti	Zr	Y	Y	Y	Y	3.086	0.138	Be	Be	Zn	Cd	Si	Si	Ge	Ge	3.572	1.299	
Mg	Mg	Si	Sn	In	In	Y	Y	1.794	0.916	Sr	Sr	Ba	Cd	Ti	Ti	HF	HF	-0.133	Be	Zn	Ge	Ti	Ga	Ga	Ga	Ga	3.086	0.247	Be	Mg	Zr	Zr	Ga	Sc	Sc	Sc	3.573	0.891		
Ca	Ca	Si	Ge	In	In	Y	Y	1.794	0.873	Be	Sr	Sr	HF	Al	Al	Al	Al	-0.044	Sr	Cd	Zr	Zr	Sc	Sc	Sc	Y	Y	3.086	0.186	Mg	Zn	Ti	Ti	Ti	Al	Al	Ga	Ga	3.573	0.682
Mg	Ba	Si	Ti	Ge	Al	In	Ga	1.794	0.942	Zn	Zn	Cd	Cd	Si	Si	Sn	Zr	2.623	0.425	Mg	Mg	Sr	Zn	Sn	Sn	Sn	Ti	3.087	0.093	Mg	Mg	Zn	Zn	Si	Ti	HF	HF	3.573	0.762	
Ba	Ba	Si	Ge	Al	Ga	Ga	Ga	1.794	0.731	Zn	Zn	Ge	Ti	In	In	Sc	Sc	-0.151	Mg	Mg	Mg	Ga	Ca	Si	Sn	Sn	HF	3.087	0.451	Mg	Mg	Mg	Ca	Si	Sn	Sn	HF	3.573	0.617	
Ca	Ba	Cd	Cd	Sn	Sn	HF	HF	1.795	0.841	Ca	Ba	Cd	Cd	Ge	HF	HF	HF	-0.051	Be	Cd	Si	Sn	Sc	Sc	Sc	Sc	3.087	0.352	Be	Sr	Sr	Sr	Ge	Sn	Zr	Zr	3.573	0.892		
Mg	Cd	Sn	Sn	Al	Al	Y	Y	1.795	0.925	Mg	Ba	Ba	Cd	Sn	Sr	Zr	Zr	2.623	0.466	Ca	Ca	Ca	Cd	Ge	Ti	Ti	HF	3.087	0.163	Be	Be	Ba	Ba	Si	Ge	Ti	Ti	3.573	0.980	
Mg	Ca	Ge	Ge	In	In	Sc	Sc	1.796	0.710	Be	Sr	Cd	Cd	Si	Si	Si	Sn	2.623	0.239	Be	Be	Sr	Cd	Ti	HF	HF	HF	3.087	0.153	Mg	Mg	Mg	Ba	Ge	Ti	Zr	Zr	3.573	0.673	
Ba	Ba	Cd	Cd	Si	Si	Ge	Sn	1.796	0.963	Sr	Sr	Ti	Ti	Al	Ga	Ga	Sc	2.624	0.192	Ca	Ca	Ca	Cd	Sn	Ti	Ti	Zr	3.087	0.200	Sr	Ba	Ba	Ba	Si	Si	Ti	HF	3.573	1.604	
Be	Ca	Sn	Sn	Al	Al	Y	Y	1.796	0.973	Sr	Sr	Sr	Cd	Sn	Ti	HF	HF	2.624	0.312	Zn	Zn	Ge	Ti	Al	Al	Al	In	3.087	0.114	Be	Ca	Ca	Sr	Sn	Sn	HF	HF	3.574	1.555	
Cd	Cd	Ge	Ge	Al	Ga	Y	Y	1.796	0.633	Ba	Cd	Ge	Ti	Al	Al	Al	Al	2.624	0.173	Ca	Sr	Sr	Zn	Si	Ge	Ge	Ge	3.087	0.347	Be	Sr	Sr	Zn	Si	Si	HF	HF	3.574	1.372	
Ba	Zn	Si	Ge	Ga	Ga	Ga	Ga	1.796	1.175	Mg	Sr	Cd	Cd	Ge	Ge	Ti	Ti	2.624	0.220	Be	Be	Sr	Cd	Si	Ti	Ti	Ti	3.087	0.406	Mg	Mg	Ca	Ba	Sn	HF	HF	HF	3.574	0.814	
Ba	Zn	Zn	Cd	Sn	Sn	Sn	Ti	1.797	1.317	Ca	Cd	Cd	Cd	Sn	Ti	Ti	HF	2.624	0.428	Mg	Ba	Ba	Zn	Si	Si	HF	HF	3.087	0.242	Mg	Mg	Ca	Ba	Ti	Zr	Zr	Zr	3.574	0.987	
Zn	Cd	Ge	Ge	Ga	Ga	Ga	Y	1.797	1.157	Sr	Ba	Ba	Cd	Si	HF	HF	HF	2.624	0.053	Be	Mg	Sn	HF	Y	Y	Y	Y	3.088	0.511	Mg	Zn	Ge	Ti	Y	Y	Y	Y	3.574	1.034	
Ca	Ca	Sn	Sn	Al	Al	Al	In	1.797	0.969	Be	Ba	Zn	Zn	Si	Si	Sn	Sn	2.624	0.183	Mg	Cd	Cd	Cd	Ge	Zr	Sc	Zr	3.088	0.458	Mg	Zn	Zn	Zn	Si	Ti	Zr	Zr	3.574	1.032	
Ba	Ba	Sn	Zr	Zr	Al	Ga	Ga	1.798	1.269	Ba	Ba	Sn	Ti	Al	Sc	Sc	Sc	2.624	0.450	Mg	Sr	Cd	Cd	Si	Si	Si	Zr	3.088	0.352	Ca	Sr	Sr	Sr	Ge	Ge	Sn	Zr	3.574	1.184	
Ca	Ca	Sn	HF	Ga	Ga	Ga	Y	1.798	1.096	Be	Sr	Si	Ti	Ga	Ga	Ga	Ga	2.624	0.032	Ca	Zn	Zn	Zn	Si	Ge	Ge	Ti	3.088	0.212	Be	Be	Mg	Mg	Si	Sn	Sn	Zr	3.574	1.052	
Mg	Ca	In	In	Sc	Sc	Sc	Sc	1.798	0.928	Zn	Zn	Si	Ti	Al	In	In	In	2.624	0.177	Zn	Cd	Cd	HF	Sn	Ti	Ti	Zr	3.088	0.266	Mg	Ca	Ba	Si	Si	Ge	Ge	Ga	3.575	0.886	
Ca	Ca	Ge	Ge	Al	Al	In	Y	1.799	1.257	Zn	Zn	Zn	Zn	Ge	Ti	Zr	Zr	2.624	0.295	Mg	Mg	HF	HF	In	Sc	Y	3.088	0.253	Mg	Ba	Si	HF	Al	Al	Ga	Ga	3.575	1.184		
Ba	Ba	Cd	Cd	Sn	Ti	Ti	HF	1.799	1.082	Cd	Cd	Sn	HF	Ge	Sc	Sc	Sc	2.624	0.478	Ca	Ca	Ti	Zr	Al	Al	Ga	Ga	3.088	0.421	Be	Be	Be	Be	Ge	Sn	Zr	Zr	3.575	1.395	
Zn	Cd	Ge	Ge	In	In	Sc	Sc	1.799	0.930	Ba	Ba	Ge	HF	Ga	Y	Y	Y	2.624	0.520	Be	Be	Sr	HF	Ga	Ga	In	In	3.088	0.457	Mg	Mg	Zn	Zn	Sn	Zr	Zr	HF	3.575	1.075	
Ba	Ba	Ge	Ti	Ga	In	In	In	1.800	1.008	Be	Be	Be	Cd	Si	Sn	Sn	Ti	2.624	0.403	Ba	Cd	Si	Si	Sc	Sc	Sc	Y	3.088	0.357	Mg	Mg	Mg	Ba	Si	Zr	HF	HF	3.575	1.376	
Sr	Sr	Sn	Zr	Ga	Ga	Ga	Sc	1.801	0.887	Ba	Ba	Sn	HF	Sc	Y	Y	Y	2.625	0.381	Ba	Zn	HF	HF	Sc	Y	Y	Y	3.088	0.266	Be	Be	Ca	Sr	Sn	Sn	Ti	Ti	3.575	1.426	
Be	Cd	Ge	Ge	Ga	Ga	Ga	In	1.801	0.896	Cd	Cd	Ge	Ge	Al	Al	Al	Y	2.625	0.486	Mg	Mg	Cd	Cd	Si	Si	Ge	HF	3.088	0.443	Ca	Ca	Ca	Ba	Si	Ti	Zr	Zr	3.576	0.800	
Ba	Cd	Si	Si	Ga	Ga	Ga	In	1.801	0.991	Ba	Zn	Sn	Ti	Ti	Al	Al	Al	2.625	0.424	Mg	Ba	Si	Si	Al	Al	Y	Y	3.088	0.532	Mg	Sr	Sr	Ba	Ti	Ti	HF	HF	3.576	0.869	
Be	Cd	Ge	Ge	Al	Al	In	In	1.802	0.865	Mg	Zn	Ti	Ti	In	In	In	Y	2.625	0.363	Be	Be	Be	Sr	Ti	Zr	Zr	HF	3.088	0.446	Ca	Ca	Ca	Sr	Ge	Ge	Sn	Zr	3.576	0.763	
Zn	Zn	Sn	Sn	Al	Ga	Ga	Sc	1.803	1.013	Ba	Ba	Ba	Cd	Si	Si	Ti	Zr	2.626	0.480	Be	Ba	Ba	Zn	Si	Ti	Ti	Ti	3.088	0.625	Mg	Zn	Ti	Zr	Y	Y	Y	Y	3.576	0.667	
Ca	Ca	Ge	Ge	Al	Ga	Ga	Sc	1.804	1.026	Ba	Ba	Ti	Ti	Ga	Ga	Sc	Y	2.626	0.238	Be	Be	Sr	Zn	Si	Zr	Zr	Zr	3.088	0.651	Be	Mg	Mg	Cd	Zr	Zr	HF	HF	3.576	0.601	
Be	Ca	Cd	Cd	Ge	Sn	Sn	Sn	1.804	0.772	Zn	Cd	Ge	Ge	Ga	Sc	Sc	Sc	2.626	0.062	Cd	Cd	Ti	Zr	Al	Al	Sc	Sc	3.089	0.284	Ca	Ba	Ba	Ba	Si	Ge	Ti	Ti	3.576	0.913	
Zn	Zn	Ge	HF	Al	In	In	In	1.804	0.976	Sr	Zn	Zn	Cd	Si	Zr	Zr	Zr	2.626	0.087	Zn	Zn	Ti	Ti	Ga	In	Sc	Sc	3.089	0.354	Sr	Sr	Ba	Ba	Si	Ti	HF	HF	3.576	0.403	
Be	Cd	Sn	Sn	Ga	Ga	Ga	Sc	1.804	1.050	Mg	Ba	Cd	Cd	Si	Si	Ge	Ge	2.626	0.262	Ca	Ca	Si	HF	Al	Al	Sc	Sc	3.089	0.326	Sr	Sr	Ba	Ba	Si	Si	Ti	HF	3.576	0.822	
Be	Sr	Si	Zr	In	In	In	In	1.805	1.144	Ca	Ba	Zr	Zr	Ga	Ga	Ga	In	2.626	0.074	Be	Be	Sr	Sr	Si	Ge	Ge	Sn	3.089	0.260	Sr	Sr	Sr	Ba	Si	Si	Sn	Ti	3.576	0.449	
Be	Ba	Ge	Ge	Al	Al	Ga	Ga	1.805	0.942	Zn	Zn	Ti	HF	Ga	Ga	Y	Y	2.626	0.058	Mg	Cd	Zr	Zr	Al	Y	Y	Y	3.089	0.203	Mg	Mg	Mg	Ba	Ge	Ge	Zr	HF	3.576	0.447	
Mg	Sr	Sr	Cd	Si	Sn	Sn	Sn	1.805	1.033	Cd	Cd	Zr	HF	Al	Al	Ga	Ga	2.626	0.215	Zn	Zn	Ge	HF	Al	Al	Al	Ga	3.089	0.118	Zn	Zn	Si	HF	Al	Al	Al	Sc	3.576	0.471	
Ba	Ba	Sn	HF	Al	Al	Al	Y	1																																

Zn	Zn	Sn	Zr	In	In	Y	Y	1.832	0.268	Ca	Ca	Si	Zr	Ga	Ga	Ga	Sc	2.636	0.706	Ca	Zn	Hf	Hf	Al	Y	Y	Y	3.096	0.672	Mg	Mg	Si	Hf	In	Sc	Sc	Sc	3.585	0.795	
Mg	Sr	Sr	Cd	Ge	Al	Ga	Sn	1.833	0.297	Be	Ba	Ba	Cd	Si	Si	Si	Ge	2.636	0.337	Be	Ca	Sn	Zr	Al	Al	Al	Al	3.096	0.758	Mg	Mg	Ba	Ba	Si	Zr	Zr	Hf	3.585	0.654	
Sr	Sr	Cd	Sn	Zr	Al	Ga	Ga	1.834	-0.114	Cd	Cd	Si	Zr	Ga	Ga	Ga	Sc	2.636	0.226	Be	Zn	Ge	Ge	Sc	Sc	Y	Y	3.096	0.162	Be	Be	Zr	Zr	Al	In	Sc	Sc	3.585	0.357	
Ba	Ba	Sn	Ti	Ga	Ga	Ga	Sc	1.835	0.263	Be	Ca	Ge	Zr	Ga	Ga	Ga	Sc	2.636	0.242	Be	Be	Sr	Cd	Si	Si	Zr	Zr	3.096	0.246	Mg	Mg	Ca	Zn	Ge	Ge	Hf	Hf	3.585	1.081	
Ca	Cd	Sn	In	Sn	Sc	Sc	Sc	1.835	0.296	Cd	Cd	Ge	Hf	Al	Al	Sc	Sc	2.636	0.345	Ca	Ba	Zn	Cd	Hf	Hf	Hf	Hf	3.097	0.222	Be	Mg	Ba	Ba	Ge	Zr	Zr	Zr	3.585	0.865	
Zn	Zn	Si	Ge	In	In	In	Y	1.835	-0.116	Ca	Cd	Sn	Zr	Al	Al	Al	Al	2.637	0.210	Be	Sr	Cd	Cd	Si	Si	Si	Ge	3.097	0.358	Ca	Sr	Sr	Ba	Ge	Ge	Ti	Ti	3.586	0.409	
Sr	Sr	Cd	Cd	Sn	Sn	Sn	Ti	1.836	0.232	Ca	Ca	Ti	Ti	Ga	Ga	In	Y	2.637	0.232	Be	Mg	Ba	Ba	Sn	Sn	Sn	Ti	3.097	0.279	Be	Be	Zr	Hf	Ga	Ga	Ga	In	3.586	0.167	
Ca	Ca	Si	Si	In	In	In	Y	1.836	0.199	Sr	Sr	Zr	Zr	Ga	Ga	Sc	Y	2.637	0.292	Ca	Ca	Ba	Cd	Si	Si	Ti	Ti	3.097	0.193	Be	Mg	Sr	Ba	Hf	Hf	Hf	Hf	3.586	0.162	
Mg	Mg	Sn	Sn	Al	Al	Al	Y	1.836	-0.206	Sr	Sr	Ti	Ti	Zr	Al	Ga	Ga	2.637	0.272	Ca	Ba	Ba	Zn	Zn	Sn	Ti	Ti	3.097	0.552	Be	Mg	Ba	Ba	Ge	Hf	Hf	Hf	3.586	0.088	
Sr	Sr	Cd	Cd	Ge	Ge	Sn	Hf	1.836	0.231	Ba	Ba	Si	Ti	Al	Al	Al	Y	2.637	0.272	Be	Be	Be	Sr	Si	Zr	Zr	Hf	3.097	0.446	Mg	Mg	Sr	Cd	Si	Si	Si	Ge	3.586	0.408	
Ca	Ca	Si	Ge	Ga	Ga	In	Y	1.836	0.195	Ca	Ca	Ge	Hf	In	Y	Y	Y	2.637	0.405	Mg	Ba	Ba	Zn	Ge	Zr	Zr	Zr	3.097	0.272	Be	Mg	Ca	Ba	Ge	Ge	Ge	Ge	3.586	0.346	
Sr	Cd	Ti	Zr	In	In	In	In	1.837	-0.214	Mg	Sr	Sn	Zr	Al	Al	Al	Al	2.637	0.282	Sr	Sr	Ba	Ba	Zn	Sn	Hf	Hf	3.097	0.210	Ca	Ca	Sr	Si	Sn	Ti	Ti	Ti	3.586	0.132	
Ba	Cd	Ge	Ge	Al	Al	Y	Y	1.837	0.445	Ba	Zn	Hf	Hf	Al	Ga	Ga	Ga	2.637	0.269	Mg	Sr	Sr	Cd	Zr	Zr	Zr	Hf	3.098	0.301	Be	Ba	Ba	Ba	Ge	Ti	Zr	Zr	3.586	1.193	
Be	Ca	Cd	Cd	Si	Sn	Sn	Sn	1.838	0.440	Ca	Ca	Zn	Ti	Ti	Ga	Ga	Y	Y	2.638	0.609	Be	Sr	Zr	Zr	Al	Al	Al	Al	3.098	0.223	Ca	Ca	Ba	Ba	Ge	Ge	Ti	Zr	3.586	1.104
Zn	Zn	Ge	Ge	In	In	Sc	Y	1.838	-0.180	Sr	Ba	Si	Si	Al	Al	Al	Y	2.638	0.264	Be	Be	Be	Zn	Si	Si	Sn	Hf	3.098	0.373	Ca	Ca	Ca	Sr	Ge	Sn	Sn	Ti	3.586	0.932	
Mg	Sr	Sn	Sn	Al	Sc	Sc	Sc	1.838	0.333	Be	Zn	Hf	Hf	In	In	In	Y	2.638	0.199	Ca	Ba	Ba	Ba	Zn	Si	Si	Ge	3.098	0.503	Ca	Sr	Sr	Sr	Si	Zr	Zr	Hf	3.586	0.292	
Ba	Zn	Ge	Hf	Ga	Ga	Ga	Ga	1.838	0.352	Sr	Ba	Ba	Cd	Si	Zr	Zr	Zr	2.638	0.485	Zn	Zn	Zn	Cd	Sn	Ti	Ti	Hf	3.098	0.357	Mg	Mg	Mg	Ba	Si	Ge	Hf	Hf	3.586	0.373	
Ca	Sr	Ge	Ge	Ga	Ga	Ga	Y	1.839	0.075	Be	Ca	Ti	Ti	In	Y	Y	Y	2.638	0.171	Be	Sr	Sr	Zn	Sn	Zr	Zr	Zr	3.098	0.607	Mg	Ca	Sr	Sr	Si	Si	Zr	Hf	3.586	0.550	
Ba	Ba	Ge	Hf	In	In	In	Y	1.839	0.305	Ca	Ba	Hf	Hf	Al	In	In	Sc	2.638	0.189	Sr	Sr	Ba	Zn	Si	Hf	Hf	Hf	3.098	0.565	Mg	Ca	Ti	Ti	Sc	Sc	Sc	Y	3.587	0.543	
Mg	Ca	Ge	Zr	In	In	In	In	1.839	0.342	Ca	Ba	Zn	Hf	Hf	Ga	Ga	Ga	Sc	2.638	0.588	Be	Ca	Ti	Hf	Ga	Ga	Ga	Ga	3.098	0.466	Mg	Sr	Ba	Ba	Zr	Hf	Hf	Hf	3.587	0.538
Be	Ca	Ge	Ge	In	In	Sc	Sc	1.839	0.055	Mg	Ca	Ca	Cd	Sn	Sn	Sn	Zr	2.638	0.030	Ba	Cd	Zr	Zr	Al	Sc	Sc	Sc	3.098	0.262	Be	Mg	Ba	Ba	Sn	Ti	Ti	Ti	3.587	0.555	
Ca	Cd	Si	Ge	Al	Ga	Ga	Ga	1.839	0.298	Ca	Ca	Si	Si	Al	Al	In	Y	2.638	0.124	Be	Be	Zn	Cd	Ge	Ge	Zr	Zr	3.098	0.381	Mg	Sr	Sr	Sr	Si	Sn	Sn	Zr	3.587	0.383	
Ba	Zn	Ge	Ge	Al	Al	Ga	Ga	1.839	0.340	Ca	Ca	Si	Zr	Ga	Ga	Y	Y	2.638	0.607	Mg	Ba	Ba	Ba	Zn	Sn	Zr	Zr	3.099	0.369	Be	Mg	Sr	Sr	Sn	Sn	Zr	Zr	3.587	0.628	
Sr	Ba	Sn	Hf	Ga	Ga	Ga	Ga	1.840	0.051	Ca	Ca	Si	Ge	In	Sc	Sc	Sc	2.638	0.007	Be	Be	Sr	Zn	Ge	Zr	Zr	Zr	3.099	0.440	Be	Ba	Ba	Ba	Si	Sn	Sn	Hf	3.587	0.955	
Ba	Cd	Cd	Cd	Si	Si	Sn	Zr	1.840	0.255	Be	Ba	Zn	Zn	Sn	Sn	Ti	Ti	2.638	0.114	Mg	Ca	Si	Si	Al	Ga	Sc	Sc	3.099	0.568	Mg	Ca	Zn	Zn	Si	Hf	Hf	Hf	3.587	0.606	
Sr	Cd	Cd	Cd	Ge	Sn	Sn	Hf	1.841	0.231	Ca	Ca	Zn	Zr	Al	In	Y	Y	2.638	0.648	Cd	Cd	Zr	Hf	Al	Sc	Sc	Sc	3.099	0.479	Sr	Sr	Sr	Ba	Si	Ti	Ti	Zr	3.587	0.787	
Sr	Sr	Ge	Zr	Ga	Ga	Ga	Y	1.841	-0.031	Cd	Cd	Ge	Zr	Ga	Y	Y	Y	2.638	0.425	Ca	Sr	Zr	Zr	Sc	Sc	Sc	Y	3.099	0.318	Be	Sr	Ba	Ba	Ge	Zr	Zr	Zr	3.588	0.973	
Sr	Zn	Ge	Zr	Ga	Ga	Ga	Sc	1.841	0.251	Be	Ba	Si	Si	Ga	Ga	Sc	Sc	2.639	0.380	Mg	Mg	Cd	Cd	Ge	Ti	Ti	Hf	3.099	0.548	Mg	Mg	Ge	Ti	In	Sc	Sc	Sc	3.588	0.365	
Mg	Zn	Sn	Ti	In	In	In	In	1.841	0.227	Ba	Zn	Cd	Cd	Ge	Ti	Ti	Ti	2.639	0.531	Zn	Zn	Zr	Hf	Sc	Sc	Sc	Y	3.099	0.632	Mg	Cd	Ge	Ti	Al	Al	Al	Al	3.588	0.371	
Be	Zn	Sn	Sn	In	Y	Y	Y	1.841	-0.041	Ca	Ca	Sr	Cd	Ge	Ge	Hf	Hf	2.639	0.363	Be	Mg	Cd	Cd	Ge	Ge	Y	Y	3.099	0.467	Be	Mg	Ca	Sn	Sn	Sn	Hf	3.588	0.287		
Ba	Ba	Si	Zr	In	In	In	Y	1.841	0.463	Sr	Zn	Ge	Ge	Sc	Sc	Y	Y	2.639	0.494	Mg	Mg	Sn	Ti	Al	Ga	Ga	Ga	3.099	0.727	Be	Be	Ba	Ba	Ge	Ge	Zr	Hf	3.588	1.100	
Be	Zn	Ge	Ge	In	Y	Y	Y	1.841	0.460	Mg	Cd	Si	Si	Ga	Ga	Y	Y	2.639	0.617	Ca	Sr	Sr	Zn	Si	Si	Hf	Hf	3.100	0.757	Mg	Mg	Mg	Ba	Si	Zr	Zr	Hf	3.588	0.943	
Cd	Cd	Ti	Hf	Al	Al	In	In	1.842	-0.014	Sr	Sr	Cd	Cd	Si	Si	Sn	Ti	2.639	0.216	Ca	Ca	Ca	Cd	Cd	Si	Ti	Ti	3.100	0.320	Be	Mg	Ca	Zn	Ge	Ge	Ge	Ge	3.588	0.649	
Be	Ca	Sn	Sn	Al	Y	Y	Y	1.842	0.320	Be	Cd	Cd	Cd	Si	Sn	Sn	Ti	2.639	0.349	Be	Cd	Hf	Hf	Ga	Sc	Sc	Sc	3.100	0.417	Ca	Ca	Ca	Sr	Ge	Zr	Zr	Hf	3.588	1.378	
Ba	Cd	Cd	Cd	Sn	Sn	Zr	Hf	1.842	0.299	Be	Cd	Ti	Ti	Ti	Al	In	In	2.639	0.644	Zn	Cd	Hf	Hf	Sc	Sc	Sc	Y	3.100	0.397	Ca	Ca	Ca	Sr	Zr	Zr	Hf	Hf	3.588	1.154	
Ca	Sr	Cd	Cd	Sn	Sn	Sn	Zr	1.842	0.392	Cd	Cd	Ti	Hf	Al	Al	Y	Y	2.640	0.191	Be	Ba	Si	Zr	Sc	Sc	Sc	Sc	3.100	0.369	Mg	Ca	Zn	Zn	Ti	Ti	Hf	Hf	3.588	0.706	
Mg	Cd	Si	Sn	Ga	Ga	Ga	Ga	1.842	0.316	Zn	Cd	Hf	Hf	Al	Ga	Y	Y	2.640	0.339	Sr	Sr	Ge	Ti	Sc	Sc	Sc	Y	3.100	0.294	Be	Mg	Mg	Cd	Sn	Ti	Ti	Ti	3.588	0.408	
Ca	Ba	Si	Sn	In	In	In	Sc	1.842	0.294	Mg	Sr	Zn	Cd	Ge	Ge	Ge	Ge	2.640	0.533	Be	Cd	Sn	Zr	Sc	Sc	Sc	Sc	3.100	0.216	Be	Be	Ge	Hf	Sc	Sc	Sc	Sc	Y	3.589	0.439
Sr	Cd	Sn	Sn	Al	Y	Y	Y	1.842	0.382	Zn	Zn	Zn	Hf	Hf	Ga	Ga	In	Y	2.640	0.682	Zn	Zn	Zn	Cd	Ge	Ge	Ti	Zr	3.100	0.558	Mg	Ca	Sr	Cd	Si	Si	Si	Si	3.589	0.376
Ba	Cd	Sn	Sn	Al	Sc	Sc	Sc	1.842	0.508	Sr	Cd	Zr	Zr	Al	Y	Y	Y	2.640	0.716	Be	Be	Be	Cd	Ge	Ti	Ti	Zr	3.100	0.458	Ca	Ba	Ba	Ba	Ge	Ge	Sn	Ti	3.589	0.607	
Cd	Cd	Ti	Hf	Ga	Ga	In	In	1.842	0.505	Sr	Sr	Cd	Zn	Si	Si	Ge	Hf	2.640	0.619	Be	Be	Ti	Hf	Al	In	In	In	3.101	0.293	Ca	Ba	Ba	Ba	Ge	Ti	Ti	Zr	3.589	0.608	
Be	Zn	Sn	Hf	In	In	In	Sc	1.842	0.408	Mg	Mg	Si	Hf	Ga	Ga	In	In	2.640	0.559	Be	Mg	Hf	Hf	Al	Al	Y	Y	3.101	0.242	Ca	Ba	Ba	Ba	Ge	Ti	Ti	Hf	3.589	0.404	
Sr	Sr	Sn	Ti	In	In	Sc	Sc	1.842	0.487	Sr	Zn	Zn	Cd	Si	Si	Ge	Ge	2.640	0.664	Be	Zn	Zr	Zr	Sc	Y	Y	Y	3.101	0.333	Be	Zn	Zr	Hf	Sc	Sc	Sc	Sc	3.589	1.515	
Be	Zn	Ge	Ge	Ga	Ga	In	In	1.843	0.479	Ca	Ca	Sn	Hf	Ga	Sc	Sc	Sc	2.640	0.635	Mg	Zn	Si	Sn	Y	Y	Y	Y	3.101	0.253	Mg	Sr	Ba	Ba	Ti	Hf	Hf	Hf	3.589	1.423	
Ca	Cd	Sn	Hf	Ga	Ga	Ga	Ga	1.843	0.311	Sr	Cd	Si	Si	Al	Al	Y	Y	2.641	0.536	Be	Ba	Ba	Zn	Ti	Ti	Hf	Hf	3.101	0.401	Mg	Mg	Zr	Zr	Al	Sc	Sc	Y	3.589	1	

Cd	Cd	Si	Zr	In	In	In	Y	1.870	-0.010	Sr	Zn	Cd	Cd	Si	Si	Si	Zr	2.649	1.135	Cd	Cd	Ti	Zr	Al	Al	Al	Y	3.110	0.359	Mg	Mg	Si	Si	Al	Ga	Ga	Sc	3.600	0.854	
Cd	Ca	Sn	Sn	Al	Sc	Sc	Y	1.871	-0.382	Ca	Sr	Sr	Cd	Si	Si	Si	Sn	2.649	1.372	Ca	Ba	Ba	Zn	Sn	HF	HF	HF	3.110	0.694	Mg	Be	Ca	Sr	Sn	Ti	Ti	Ti	3.600	0.649	
Zn	Ca	Sn	HF	In	In	In	Y	1.871	0.008	Cd	Sr	Sr	Cd	Si	Si	Si	HF	2.650	1.289	Mg	Zn	Ge	Sn	Al	Al	Al	Al	3.110	0.597	Be	Mg	Ca	Ca	Sn	Sn	Sn	Zr	3.600	1.027	
Ca	Sr	Sn	Sn	Al	Y	Y	Y	1.871	-0.014	Ba	Cd	Si	Si	Al	Al	Al	Y	2.650	1.059	Mg	Mg	Zn	Zn	Cd	Sn	Ti	HF	3.110	0.431	Mg	Ba	Ba	Ba	Si	Zr	Zr	HF	3.600	1.028	
Sr	Sr	Sn	HF	Al	Al	Al	Y	1.871	-0.392	Zn	Zn	Si	Si	Al	Al	Ga	In	2.651	1.269	Zn	Ba	Zn	Cd	Sn	Si	Ge	Zr	3.110	0.340	Mg	Mg	Ca	Zn	Ge	HF	HF	HF	3.601	0.663	
Ca	Ca	Sn	HF	Ga	In	In	In	1.872	0.215	Ba	Ba	Sn	Zr	Y	Y	Y	Y	2.651	1.275	Mg	Sr	Zn	Zn	Ge	Ge	Ge	HF	3.111	0.474	Mg	Zn	Cd	Cd	Si	Si	Si	Zr	3.601	1.118	
Mg	Mg	Si	Sn	In	In	In	In	1.872	0.212	Ba	Ba	Si	HF	Al	Al	Al	Ga	2.651	1.042	Mg	Ba	Ba	Zn	Zn	Si	Si	Zr	3.111	0.386	Be	Mg	Ge	Sn	Al	Al	Al	Al	3.601	1.108	
Ba	Ba	Sn	Zr	Al	Al	Al	Y	1.872	-0.368	Be	Zn	Sn	Al	Al	Al	Al	Y	2.651	1.241	Ba	Ba	Ti	Zr	Zr	Sc	Sc	Y	3.111	0.462	Mg	Be	Si	Ge	Ga	Ga	Ga	Sc	3.601	0.926	
Mg	Ba	Ge	Ge	In	Y	Y	Y	1.872	0.142	Mg	Ba	Sn	Zr	Sc	Sc	Sc	Sc	2.651	1.268	Ca	Sr	Zn	Zn	Ti	Ti	HF	HF	3.111	0.662	Mg	Mg	Ba	Ba	Si	Ge	Ge	Ti	3.601	0.843	
Mg	Mg	Sn	Al	Ga	Ga	Ga	Y	1.873	0.125	Ba	Ba	Ge	Ti	In	Y	Y	Y	2.651	0.832	Mg	Mg	Zn	Zn	Si	Sn	Zr	Zr	3.111	0.508	Mg	Mg	Sr	Ba	Ge	Zr	Zr	Zr	3.602	0.802	
Be	Cd	Sn	Sn	Ga	Sc	Sc	Sc	1.873	-0.100	Cd	Sr	Ge	HF	Ga	Y	Y	Y	2.651	0.827	Be	Be	Be	Sr	Ge	Ti	HF	HF	3.111	0.732	Mg	Ca	Zn	Zn	Si	Zr	Zr	Zr	3.602	0.725	
Ca	Ca	Sn	HF	In	In	Sc	Sc	1.873	-0.140	Sr	Cd	Gd	Zr	Al	Ga	Ga	Y	2.652	0.813	Be	Mg	Sr	Cd	Zr	Zr	Zr	Zr	3.111	0.706	Mg	Mg	Cd	Cd	Ge	Ti	Ti	Ti	3.602	1.046	
Ca	Ca	Ge	Ge	Ga	Ga	Sc	Y	1.873	-0.113	Ca	Ca	Zn	Zn	Si	Si	Sn	HF	2.652	0.823	Be	Be	Zn	Zn	Si	Sn	Zr	Zr	3.111	0.605	Ca	Ca	Ca	Sr	Si	Sn	HF	3.603	0.954		
Ca	Zn	Cd	Cd	Sn	Sn	HF	HF	1.873	-0.165	Sr	Ba	Zr	Zr	Al	Al	Ga	Ga	2.652	0.812	Zn	Zn	Si	Zr	Zr	Ga	Ga	Sc	3.111	0.375	Be	Be	Mg	Ba	Ge	Ti	Ti	Ti	3.603	0.703	
Zd	Cd	Sn	Sn	Al	Y	Y	Y	1.874	0.091	Ba	Ba	Zn	Sn	Zr	Sc	Sc	Sc	2.652	0.802	Sr	Cd	HF	HF	Al	Sc	Sc	Sc	3.111	0.543	Be	Cd	Ti	Ti	Al	Al	Al	Ga	3.603	0.859	
Be	Sr	Cd	Cd	Ge	Ge	Sn	Sn	1.874	0.111	Ba	Zn	HF	HF	Al	Y	Y	Y	2.652	0.821	Be	Be	Sn	HF	HF	Sc	Y	Y	Y	3.111	0.512	Mg	Mg	Si	Ge	Sc	Sc	Y	Y	3.603	0.903
Sr	Sr	Cd	Cd	Sn	Sn	Ti	HF	1.874	-0.169	Sr	Ba	HF	HF	Ga	Y	Y	Y	2.652	0.818	Sr	Ba	Si	HF	Y	Y	Y	Y	3.112	0.513	Be	Be	Ca	Cd	Si	Si	Si	Ti	3.603	0.992	
Ba	Cd	Ge	Sn	Al	Al	Al	Al	1.874	0.025	Sr	Zn	Ge	HF	Al	Al	Al	Al	2.652	0.816	Zn	Cd	Cd	Cd	Ge	Zr	HF	HF	3.112	0.717	Be	Be	Sn	Zr	Al	Al	Al	In	3.603	1.037	
Sr	Cd	Si	Si	Ga	Ga	Ga	In	1.874	0.012	Zn	Cd	Ge	Sn	Sc	Sc	Sc	Sc	2.652	0.805	Be	Be	Sr	Zn	Zr	Zr	Zr	HF	3.112	0.611	Ca	Ca	Ca	Sr	Ti	Zr	Zr	HF	3.603	1.052	
Ba	Ba	Si	Si	Al	In	In	Y	1.874	-0.216	Be	Be	Be	Sn	Si	Sn	Sn	Zr	2.652	0.722	Zn	Zn	Ti	Ti	Ti	Al	Al	In	Sc	3.112	0.414	Mg	Ca	Ba	Ba	Zr	HF	HF	HF	3.603	0.982
Ca	Ca	Si	Ge	Ga	Ga	Ga	In	1.875	0.019	Be	Mg	Ge	Ca	Ga	Ga	Ga	Y	2.652	0.700	Be	Zn	Ge	HF	Y	Y	Y	Y	3.112	0.675	Zn	Cd	Ti	Zr	Al	Al	Al	Al	3.604	0.948	
Sr	Sr	Sn	Ti	Ga	Ga	Ga	Sc	1.875	0.007	Mg	Ca	Cd	Cd	Sn	Sn	Zr	Zr	2.652	0.898	Mg	Ca	Cd	Cd	Si	HF	HF	HF	3.112	0.743	Mg	Mg	Mg	Sr	Ge	Zr	HF	HF	3.604	0.998	
Mg	Zn	Ge	HF	In	In	In	In	1.875	-0.227	Sr	Sr	Sr	Cd	Si	Ge	Ti	Ti	2.652	0.678	Be	Be	Cd	Cd	Si	Ge	Zr	Zr	3.112	0.524	Be	Mg	Si	Zr	Y	Y	Y	Y	3.604	0.884	
Be	Sr	Si	Si	Al	In	In	In	1.876	0.225	Ba	Ba	Zn	Cd	Ti	Zr	Zr	Zr	2.653	0.571	Be	Ca	Sn	Cd	Ga	Ga	Sc	Sc	3.112	0.840	Mg	Mg	Zn	Zn	Y	Si	Ge	Zr	3.604	0.969	
Ba	Ba	Cd	Cd	Si	Si	Sn	Zr	1.876	0.223	Ba	Ba	Zr	HF	Al	Al	Ga	Ga	2.653	0.930	Be	Be	Be	Cd	Ge	Ge	Ti	HF	3.112	0.857	Be	Zn	Sn	Zr	Al	Al	Al	Al	3.604	0.957	
Be	Sr	Si	Si	In	In	In	Sc	1.876	-0.209	Ca	Zn	Zn	Zn	Si	Si	Sn	HF	2.653	0.752	Zn	Zn	Sn	Si	Ti	Al	Al	Ga	3.112	0.391	Ca	Ba	Ba	Ba	Si	Si	Sn	HF	3.604	0.815	
Ba	Ba	Sn	HF	Ga	Ga	Ga	Ga	1.876	0.031	Mg	Mg	Cd	Cd	Si	Sn	HF	HF	2.653	0.754	Mg	Ba	Ge	Ti	Sc	Sc	Sc	Sc	3.112	0.515	Mg	Mg	Ca	Ba	Zr	Zr	HF	HF	3.605	1.126	
Zn	Zn	Sn	Ti	Ga	Ga	In	In	1.876	0.017	Ba	Ba	HF	HF	In	Y	Y	Y	2.653	0.904	Mg	Cd	Sn	HF	Sc	Sc	Sc	Sc	3.113	0.496	Be	Be	Mg	Ba	Ge	Ge	Zr	Zr	3.605	1.127	
Ba	Ba	Ge	Sn	Al	Al	Sc	Sc	1.876	0.135	Ca	Ti	Ti	Ti	Al	In	In	Sc	2.653	0.568	Be	Ba	Si	Si	Sc	Y	Y	Y	3.113	0.350	Be	Mg	Ti	Ti	Ga	Ga	Ga	Y	3.605	0.812	
Mg	Sr	Si	Si	In	In	In	Sc	1.876	0.025	Ca	Cd	HF	HF	Ga	Ga	Ga	Y	2.654	0.698	Sr	Sr	Sr	Zn	Si	Ti	Zr	Zr	3.113	0.298	Be	Ca	Ba	Ba	Si	Si	Si	Ge	3.605	0.880	
Mg	Ba	Ba	Cd	Ge	Ge	Sn	Sn	1.877	0.012	Be	Sr	Sr	Cd	Sn	HF	HF	HF	2.654	0.898	Ca	Ba	Ti	HF	Y	Y	Y	Y	3.113	0.198	Be	Zn	Zn	Zn	Si	Ge	HF	HF	3.605	0.896	
Sr	Ba	Si	Si	Al	In	In	In	1.877	0.125	Ba	Ba	Ti	Ti	Al	Ga	Ga	Ga	2.654	0.532	Be	Ca	Ti	HF	Y	Y	Y	Y	3.113	0.533	Be	Mg	Si	Zr	Ga	Ga	Ga	Ga	3.605	0.688	
Ca	Zn	Sn	Sn	Ga	Y	Y	Y	1.877	0.213	Zn	Zn	Si	Zr	Ga	Ga	Ga	In	2.654	0.687	Ba	Ba	Ti	Zr	Sc	Y	Y	Y	3.113	0.458	Sr	Ba	Ba	Ba	Si	Si	Sn	Ti	3.605	1.064	
Sr	Zn	Sn	Zr	Ga	Ga	Ga	In	1.877	0.211	Mg	Mg	Ca	Cd	Sn	Sn	Sn	Zr	2.654	0.975	Mg	Mg	Cd	Cd	Sn	Zr	Zr	HF	3.113	0.236	Be	Be	HF	HF	Al	Ga	Ga	Y	3.605	1.066	
Mg	Sr	Si	Ti	Ga	In	Ga	In	1.877	0.144	Mg	Mg	Sr	Zn	Zn	Sn	Sn	Ti	2.654	0.834	Be	Be	Si	Ge	In	In	Sc	Sc	3.113	0.242	Be	Be	Mg	Ca	Sn	Sn	HF	HF	3.605	0.699	
Ba	Ba	Ge	Sn	Ga	Sc	Sc	Sc	1.878	0.128	Ba	Zn	Ti	Ti	Ga	Ga	Ga	Sc	2.654	0.761	Be	Be	Sr	Zn	Ti	Ti	HF	HF	3.113	0.295	Mg	Ca	Ba	Ba	Ge	Ge	HF	HF	3.605	1.123	
Ba	Ba	Si	Ti	In	In	In	Y	1.879	0.121	Ba	Ba	Zn	Zn	Ti	Ti	Zr	HF	2.654	0.997	Be	Ca	Ba	Ba	Ge	Ge	Ge	Sn	3.113	0.171	Be	Cd	Si	Ge	Al	Al	Al	Al	3.606	1.116	
Ca	Zn	Si	Sn	Al	In	In	In	1.879	-0.045	Ca	Ba	Zr	Zr	Zr	Ga	Ga	Y	Y	2.654	0.910	Mg	Mg	Zr	HF	Ga	Ga	In	In	3.113	0.411	Mg	Mg	Zn	Zr	Al	Al	Sc	Sc	3.606	0.935
Ba	Ba	Sn	HF	Al	Al	Ga	Ga	1.879	0.297	Mg	Zn	Zr	Zr	Al	In	In	In	2.654	0.979	Mg	Zn	Ti	Ti	In	Y	Y	Y	3.113	0.478	Mg	Sr	Zn	Zn	Si	Si	Si	HF	3.606	0.880	
Ca	Sr	Cd	Cd	Sn	Sn	Zr	Zr	1.879	0.229	Mg	Ba	Sn	Zr	Y	Y	Y	Y	2.654	0.953	Be	Be	Si	Si	Al	In	Y	Y	3.113	0.256	Mg	Zn	Cd	Cd	Si	Si	Si	Ti	3.606	0.831	
Ca	Ca	Cd	Cd	Si	Sn	Sn	HF	1.880	0.107	Sr	Sr	Cd	Cd	Ti	Zr	HF	HF	2.654	0.706	Mg	Ca	Ca	Cd	Si	Zr	Zr	Zr	3.113	0.568	Ca	Zn	Ti	Ti	Al	Al	Sc	Sc	3.607	0.746	
Be	Mg	Ba	Cd	Sn	Sn	Sn	Sn	1.881	0.264	Sr	Ba	Ti	Zr	Ga	Ga	Ga	Ga	2.654	0.935	Be	Mg	Si	Si	In	Y	Y	Y	3.114	0.529	Ca	Sr	Ba	Si	Si	Si	Sn	3.607	1.078		
Mg	Ca	Ba	Cd	Sn	Sn	Sn	Sn	1.881	0.267	Be	Be	Mg	Ba	Si	Sn	Sn	Sn	2.654	0.944	Ba	Ba	Ba	Zn	Si	Si	Ge	Zr	3.114	0.397	Ba	Zn	Cd	Cd	Si	Si	Zr	Zr	3.607	0.980	
Ca	Ca	Ge	HF	Al	In	In	In	1.881	0.142	Ba	Zn	Si	Sn	Sc	Sc	Sc	Sc	2.655	0.666	Be	Mg	Sn	Zr	Ga	Ga	Ga	Ga	3.114	0.284	Mg	Mg	Zn	Zn	Sn	Ti	Ti	HF	3.607	0.722	
Cd	Cd	Si	Zr	Ga	Ga	In	In	1.881	0.173	Mg	Ca	Ge	Ge	Al	Y	Y	Y	2.655	0.924	Zn	Cd	Cd	Cd	Ge	Ti	Zr	Zr	3.114	0.325	Mg	Mg	Ca	Ba	Zr	Zr	Zr	HF	3.607	0.892	

Sr	Cd	Cd	Cd	Ge	Sn	Sn	Ti	1.906	0.240	Ca	Ba	Ba	Cd	Ti	Ti	Hf	Hf	2.663	0.797	Sr	Ba	Ba	Zn	Ge	Ge	Ge	Zr	3.123	0.305	Be	Mg	Mg	Zn	Sn	Sn	Ti	Ti	3.618	1.626	
Ba	Cd	Ti	Ti	Al	In	In	In	1.907	0.800	Sr	Sr	Zr	Zr	Al	Al	Ga	Ga	2.663	0.807	Be	Be	Cd	Cd	Ti	Zr	Hf	Hf	3.123	0.274	Be	Zn	Ti	Ti	Ga	Sc	Sc	Sc	3.618	0.950	
Cd	Cd	Cd	Cd	Ge	Ge	Ge	Sn	1.907	0.769	Sr	Sr	Ti	Hf	Al	Al	Y	Y	2.663	0.798	Be	Be	Be	Ca	Ge	Ge	Sn	Hf	3.123	0.537	Mg	Mg	Sr	Sr	Ti	Zr	Hf	Hf	3.618	1.109	
Ca	Ba	Cd	Cd	Sn	Sn	Sn	Ti	1.907	0.513	Zn	Zn	Cd	Cd	Sn	Sn	Ti	Zr	2.663	0.661	Mg	Mg	Cd	Cd	Si	Si	Ge	Zr	3.123	1.095	Mg	Zn	Zn	Cd	Si	Ti	Ti	Ti	3.618	1.416	
Mg	Zn	Sn	Sn	Sn	Ga	Ga	Sc	1.907	0.722	Mg	Zn	Ge	Ge	Al	Al	Ga	Ga	2.663	0.779	Ca	Ca	Sr	Cd	Si	Si	Si	Hf	3.123	0.972	Mg	Zn	Sn	Sn	Sn	Sn	Sc	Sc	3.618	0.950	
Ba	Ba	Ge	Hf	Ga	Ga	Ga	Sc	1.908	0.751	Zn	Zn	Zn	Cd	Ge	Sn	Hf	Hf	2.663	0.799	Ca	Ba	Ba	Zn	Ge	Zr	Zr	3.123	0.971	Be	Be	Ge	Ge	Sc	Sc	Y	Y	3.618	1.096		
Sr	Sr	Sn	Ti	Al	Ga	Ga	Ga	1.908	0.483	Mg	Ba	Ba	Cd	Si	Si	Hf	Hf	2.664	0.635	Mg	Sr	Ti	Ti	Ti	Ga	Sc	Sc	3.124	0.416	Ca	Ca	Ca	Sr	Si	Sn	Zr	3.619	1.453		
Be	Sr	Ge	Ge	Ga	Y	Y	Y	1.908	0.705	Sr	Cd	Hf	Hf	In	Y	Y	Y	2.664	0.773	Be	Sr	Cd	Cd	Ti	Ti	Zr	Zr	3.124	0.468	Be	Mg	Mg	Zn	Ge	Ge	Hf	Hf	3.619	1.004	
Cd	Cd	Si	Ti	Ge	Ga	In	In	1.908	0.746	Mg	Mg	Cd	Cd	Si	Si	Ge	Sn	2.664	0.840	Sr	Cd	Zr	Hf	Y	Y	Y	Y	3.124	0.757	Ca	Sr	Sr	Sr	Si	Si	Sn	Zr	3.619	1.336	
Ca	Sr	Cd	Cd	Ge	Ge	Ge	Sn	1.908	0.477	Mg	Mg	Ca	Cd	Si	Si	Sn	Sn	2.664	1.109	Be	Mg	Sr	Cd	Hf	Hf	Hf	Hf	3.124	0.449	Zn	Zn	Si	Zr	Al	Sc	Sc	Sc	3.619	1.657	
Ba	Ba	Cd	Cd	Si	Sn	Ti	Ti	1.908	0.611	Be	Zn	Zn	Cd	Si	Si	Sn	Sn	2.664	1.067	Be	Be	Ti	Hf	Al	Y	Y	Y	3.124	0.453	Mg	Mg	Mg	Zn	Si	Ge	Hf	Hf	3.619	0.980	
Zn	Cd	Zr	Hf	In	In	In	In	1.910	0.631	Ba	Cd	Zr	Zr	In	Y	Y	Y	2.664	0.830	Mg	Mg	Ge	Ti	In	Y	Y	Y	3.124	0.802	Ca	Sr	Sr	Sr	Ge	Ti	Hf	Hf	3.619	1.320	
Ba	Cd	Hf	Hf	In	In	In	Y	1.910	0.449	Ba	Ba	Si	Si	In	Sc	Sc	Y	2.664	0.996	Mg	Sr	Ti	Hf	Y	Y	Y	Y	3.124	0.466	Mg	Ca	Ca	Sr	Sn	Sn	Ti	Ti	3.619	1.712	
Mg	Ba	Ge	Ge	Al	Al	Al	In	1.910	0.596	Ba	Ba	Hf	Hf	Ga	Ga	Sc	Y	2.664	1.047	Mg	Ba	Ba	Zn	Si	Hf	Hf	Hf	3.124	0.700	Ca	Sr	Sr	Sr	Ge	Ge	Sn	Ti	3.619	0.627	
Sr	Sr	Sn	Ti	Al	Al	Y	In	1.910	0.623	Sr	Ba	Ge	Ge	Sc	Sc	Y	Y	2.664	0.831	Be	Mg	Si	Ge	Ga	Ga	Ga	Ga	3.124	0.985	Ca	Ca	Ca	Ba	Si	Sn	Ti	Ti	3.619	0.703	
Cd	Cd	Si	Sn	In	Y	Y	Y	1.910	0.436	Sr	Zn	Si	Si	Al	Al	Ga	Ga	2.664	0.973	Ca	Sr	Ti	Ti	Al	Al	Al	Ga	3.125	0.478	Mg	Sr	Sr	Sr	Si	Sn	Ti	Ti	3.620	0.821	
Ca	Zn	Zn	Cd	Sn	Sn	Sn	Hf	1.910	0.752	Ba	Zn	Zr	Hf	Ga	Ga	Ga	Ga	2.664	1.042	Be	Be	Ge	Zr	In	In	Sc	Sc	3.125	0.682	Mg	Mg	Mg	Sr	Ge	Zr	Zr	Hf	3.620	0.734	
Sr	Sr	Ge	Sn	Al	Al	Sc	Sc	1.910	0.757	Mg	Sr	Zr	Ti	In	Y	Y	Y	2.664	0.532	Be	Be	Be	Cd	Si	Sn	Ti	Ti	3.125	1.048	Be	Ca	Ti	Ti	Al	Al	Al	Ga	3.620	0.661	
Cd	Cd	Si	Ge	Ga	Ga	Y	Y	1.912	0.425	Mg	Mg	Ge	Hf	In	In	Sc	Sc	2.664	0.452	Sr	Sr	Sr	Zn	Ge	Ti	Zr	Zr	3.125	0.173	Be	Be	Be	Ca	Ge	Sn	Ti	Ti	3.620	0.538	
Mg	Cd	Ge	Ge	Ga	Ga	Y	Y	1.912	0.671	Ca	Cd	Ti	Ti	Ga	Ga	Ga	Y	2.665	0.479	Ca	Sr	Zr	Zr	Al	Sc	Sc	Sc	3.125	0.200	Be	Mg	Sr	Sr	Sn	Hf	Hf	Hf	3.620	0.889	
Ca	Zn	Cd	Cd	Ge	Ge	Sn	Sn	1.912	0.692	Zn	Zn	Sn	Ti	Ga	Ga	Ga	Sc	2.665	0.536	Mg	Mg	Mg	Zn	Si	Sn	Sn	Zr	3.125	0.323	Be	Be	Mg	Sr	Ge	Ge	Ge	Ti	3.620	0.732	
Be	Ca	Sn	Cd	Al	Al	Al	Y	1.912	0.845	Zn	Zn	Sn	Zr	Al	Al	Al	In	2.665	0.437	Mg	Mg	Mg	Ba	Si	Sn	Zr	Zr	3.125	1.005	Mg	Mg	Sr	Zn	Zr	Zr	Hf	3.620	0.560		
Sr	Ba	Ba	Cd	Si	Sn	Sn	Sn	1.913	0.656	Ba	Sr	Zr	Al	Al	Al	Ga	Sc	2.665	0.470	Mg	Mg	Ba	Cd	Si	Si	Hf	Hf	3.126	0.924	Mg	Mg	Sr	Sr	Ge	Sn	Hf	Hf	3.620	0.427	
Cd	Cd	Sn	Ti	Ga	Ga	Y	Y	1.914	0.684	Sr	Sr	Ba	Cd	Ge	Zr	Zr	Zr	2.665	0.462	Mg	Sr	Zr	Zr	Sc	Sc	Y	Y	3.126	0.802	Mg	Zn	Si	Zr	Y	Y	Y	Y	3.620	0.412	
Be	Ba	Ba	Zn	Si	Sn	Sn	Sn	1.914	0.833	Be	Be	Ba	Cd	Si	Hf	Hf	Hf	2.665	0.447	Zn	Cd	Ti	Cd	Zr	Y	Y	Y	Y	3.126	1.141	Be	Mg	Mg	Ba	Sn	Sn	Ti	Ti	3.620	0.457
Sr	Sr	Ge	Sn	Ga	Ge	Sc	Sc	1.914	0.792	Ca	Ca	Ti	Hf	Ga	Ga	Y	Y	2.665	0.448	Mg	Mg	Ba	Cd	Zr	Zr	Zr	Hf	3.126	0.956	Ca	Sr	Sr	Ba	Ge	Ti	Ti	Ti	3.620	0.503	
Ca	Ca	Zn	Cd	Sn	Sn	Sn	Hf	1.915	0.797	Ca	Zn	Cd	Cd	Ti	Ti	Hf	Hf	2.665	0.508	Ba	Zn	Hf	Hf	Al	Sc	Sc	Sc	3.127	0.846	Ca	Ca	Ba	Ba	Ti	Ti	Ti	Hf	3.620	0.460	
Sr	Sr	Ge	Sn	Al	Al	Y	Y	1.915	0.820	Ba	Cd	Cd	Si	Si	Al	Al	Al	Y	2.665	0.372	Sr	Sr	Ge	Ti	Al	Al	Al	Al	3.127	0.513	Mg	Sr	Sr	Ba	Zr	Zr	Hf	Hf	3.620	0.506
Sr	Cd	Ge	Ti	Ga	Ga	Ga	Ga	1.916	0.707	Sr	Sr	Sr	Cd	Si	Ge	Ge	Hf	2.665	0.345	Ba	Ba	Si	Hf	Sc	Y	Y	Y	3.127	0.508	Mg	Ba	Ba	Ba	Si	Ge	Ti	Ti	3.621	0.917	
Ca	Ca	Cd	Cd	Ge	Sn	Sn	Hf	1.917	0.706	Mg	Sr	Sr	Ti	Ti	Ga	Ga	Y	2.665	0.720	Cd	Cd	Si	Hf	Sc	Y	Y	Y	3.127	0.682	Ca	Zn	Ti	Ti	Sc	Sc	Sc	Y	3.621	0.816	
Sr	Sr	Ge	Ti	Ga	Ga	In	Y	1.917	0.592	Ca	Ba	Sn	Hf	Y	Y	Y	Y	2.666	0.364	Be	Ca	Ca	Cd	Sn	Ti	Ti	Ti	3.127	0.501	Mg	Cd	Ti	Ti	Al	Al	Al	Al	3.621	0.757	
Ba	Ba	Sn	Hf	Ga	Ga	Y	Y	1.917	0.007	Sr	Zn	Si	Si	In	Y	Y	Y	2.666	0.286	Mg	Mg	Ti	Zr	Ga	Ga	In	In	3.127	0.495	Mg	Ba	Ba	Ba	Ge	Ge	Sn	Hf	3.621	0.493	
Be	Cd	Si	Si	Ga	In	In	In	1.918	-0.057	Be	Sr	Sn	Zr	Sc	Sc	Sc	Sc	2.666	0.511	Ca	Ca	Zr	Zr	Al	Sc	Sc	Y	3.127	0.733	Be	Be	Ca	Ca	Si	Ge	Ge	Zr	3.621	0.483	
Ca	Sr	Si	Hf	In	Ge	In	In	1.918	-0.170	Sr	Sr	Ti	Ti	Ga	Ga	Sc	Y	2.666	0.235	Be	Be	Zn	Zn	Sn	Sn	Ti	Zr	3.127	1.211	Be	Ba	Ba	Ba	Ge	Ge	Zr	Hf	3.621	0.616	
Ba	Ba	Cd	Cd	Si	Ge	Ge	Hf	1.918	0.013	Zn	Zn	Sn	Ti	Al	Al	Ga	Ga	2.666	0.281	Sr	Ba	Si	Si	Al	Y	Y	Y	3.127	1.095	Mg	Mg	Mg	Cd	Si	Ge	Ti	Ti	3.621	0.601	
Sr	Cd	Zr	Hf	In	In	In	In	1.919	-0.028	Ca	Sr	Cd	Cd	Ge	Zr	Zr	Zr	2.666	0.594	Sr	Sr	Ti	Hf	Sc	Y	Y	Y	3.127	1.097	Be	Ca	Ca	Ti	Ti	Hf	Hf	Hf	3.621	0.530	
Sr	Ba	Cd	Cd	Sn	Sn	Ti	Ti	1.919	-0.145	Ba	Ba	Si	Ge	Al	Y	Y	Y	2.666	0.093	Be	Ca	Zr	Hf	Ga	Ga	Ga	Ga	3.127	0.620	Be	Cd	Cd	Cd	Si	Si	Ti	Hf	3.621	0.649	
Mg	Cd	Ge	Ge	Al	Al	Al	Y	1.919	-0.058	Mg	Mg	Ge	Ge	In	Sc	Y	Y	2.666	0.227	Be	Ba	Si	Si	Al	Al	Al	Sc	3.127	0.652	Mg	Mg	Sr	Sr	Ti	Zr	Zr	Hf	3.621	0.509	
Ba	Mg	Ge	Sn	Ga	Ga	Y	Y	1.920	-0.056	Sr	Sr	Zn	Zn	Si	Si	Ge	Zr	2.666	0.612	Mg	Ba	Cd	Cd	Ti	Zr	Zr	Zr	3.128	0.907	Mg	Mg	Zn	Zn	Si	Zr	Zr	Hf	3.621	0.670	
Cd	Cd	Sn	Ti	Al	Al	Ga	Ga	1.920	-0.171	Be	Be	Ca	Sr	Ge	Sn	Sn	Sn	2.666	0.070	Be	Sr	Ge	Ti	Sc	Sc	Sc	Sc	3.128	0.638	Be	Be	Be	Ca	Si	Si	Ge	Hf	3.621	0.855	
Sr	Sr	Cd	Cd	Si	Ge	Zr	Zr	1.921	-0.071	Sr	Sr	Si	Ti	Ga	Ga	Y	Y	2.666	0.218	Cd	Cd	Ge	Ti	Sc	Sc	Sc	Y	3.128	0.630	Ca	Sr	Sr	Sr	Ge	Ge	Ti	Zr	3.622	0.594	
Ba	Ba	Ge	Sn	Al	Al	Y	Y	1.921	-0.061	Ca	Sr	Cd	Cd	Ti	Ti	Ti	Hf	2.667	0.745	Mg	Mg	Sr	Cd	Si	Ge	Ge	Ge	3.128	0.951	Be	Be	Be	Ca	Si	Ti	Ti	Zr	3.622	0.712	
Be	Ba	Sn	Zr	Ga	Ga	Ga	Ga	1.922	-0.175	Ca	Ba	Hf	Hf	Ga	Ga	Y	Y	2.667	0.526	Mg	Ca	Ca	Cd	Ge	Ge	Ge	Hf	3.128	0.671	Mg	Mg	Ba	Ba	Ge	Ti	Zr	Zr	3.622	0.905	
Be	Ba	Ba	Cd	Ge	Sn	Sn	Sn	1.922	0.280	Cd	Cd	Zr	Zr	Ga	Ga	Sc	Y	2.667	0.481	Mg	Ca	Cd	Cd	Ge	Ti	Ti	Ti	3.128	0.880	Mg	Sr	Zn	Zn	Ti	Ti	Ti	Hf	3.622	0.337	
Sr	Cd	Ti	Ti	In	In	In	Y	1.922	0.259	Cd	Cd	Hf	Hf	Al	In	Sc	Sc	2.667	0.548	Sr	Zn	Si	Hf	Y	Y	Y	Y	3.128	1.130	Be	Mg	Sr	Sr	Sn	Zr	Zr	Zr	3.622		

Sr	Cd	Sn	Sn	Sc	Sc	Y	1.942	0.832	Be	Be	Zr	Hf	In	In	Y	Y	2.676	0.563	Sr	Ba	Ti	Ti	Al	Sc	Sc	Sc	3.136	0.435	Mg	Mg	Mg	Ba	Ge	Ti	Ti	Hf	3.632	0.476	
Sr	Sr	Si	Hf	In	In	In	1.942	0.975	Be	Be	Mg	Mg	Cd	Sn	Sn	Sn	2.676	0.758	Be	Be	Ge	Sn	Al	Ga	Ga	Ga	3.136	0.499	Be	Be	Si	Sn	Al	Al	Al	In	3.632	0.705	
Ba	Zn	Ti	Zr	In	In	In	1.942	0.849	Be	Be	Zr	Cd	Sn	Sn	Sn	Hf	2.676	0.390	Ba	Zn	Zn	Cd	Si	Ti	Hf	Hf	3.136	0.487	Ca	Zn	Si	Ti	Al	Al	Al	In	3.632	1.101	
Ba	Zn	Sn	Ti	In	In	In	1.943	0.737	Ba	Ba	Ba	Zn	Ge	Sn	Sn	Hf	2.676	0.543	Sr	Sr	Sr	Zn	Sn	Zr	Hf	Hf	3.136	0.464	Be	Ca	Sr	Sr	Sn	Zr	Zr	Zr	3.633	0.508	
Zn	Zn	Ge	Ti	Al	In	In	1.943	0.808	Ba	Ca	Ge	Sn	Sc	Sc	Sc	Sc	2.676	0.959	Be	Sr	Cd	Cd	Si	Ti	Ti	Ti	3.136	0.579	Mg	Mg	Mg	Zn	Ge	Zr	Zr	Hf	3.633	0.666	
Zn	Cd	Cd	Cd	Si	Ge	Sn	1.943	0.826	Ba	Ca	Hf	Hf	Al	Ga	Sc	Sc	2.676	0.752	Sr	Sr	Zn	Zn	Si	Zr	Hf	Hf	3.136	0.460	Mg	Mg	Ti	Hf	In	Sc	Sc	Sc	3.633	1.153	
Be	Be	Ge	Sn	In	In	Y	1.943	0.708	Ca	Ca	Zn	Cd	Si	Si	Ge	Ge	2.676	0.765	Mg	Ba	Ba	Ba	Zn	Si	Zr	Zr	3.136	0.601	Ca	Ca	Sr	Sr	Ge	Ge	Ti	Hf	3.633	0.194	
Ca	Ba	Si	Zr	In	In	In	1.943	0.797	Mg	Ca	Zr	Zr	In	In	In	Sc	2.676	0.876	Ca	Ca	Zn	Zn	Sn	Ti	Ti	Zr	3.136	0.666	Mg	Mg	Ca	Zn	Ge	Ge	Zr	Zr	3.633	0.191	
Sr	Cd	Sn	Sn	Sc	Sc	Y	1.943	0.811	Be	Ba	Hf	Hf	Sc	Y	Y	Y	2.676	0.836	Ba	Cd	Ti	Ti	Sc	Sc	Y	Y	3.137	0.484	Mg	Mg	Ti	Ti	Al	Sc	Sc	Y	Y	3.633	0.330
Ca	Sr	Zn	Zn	Si	Sn	Sn	1.943	0.742	Sr	Ba	Zr	Zr	Ga	Ga	Sc	2.676	0.836	Ca	Ba	Zn	Zn	Ge	Ti	Ti	Ti	3.137	0.625	Mg	Mg	Ca	Ba	Ti	Ti	Ti	Hf	3.634	1.362		
Sr	Sr	Ge	Hf	Ga	Ga	Ga	1.944	0.757	Sr	Sr	Sn	Hf	Sc	Y	Y	Y	2.676	0.864	Be	Be	Cd	Cd	Si	Ti	Ti	Hf	3.137	0.765	Be	Be	Be	Mg	Si	Sn	Hf	Hf	3.634	1.221	
Mg	Ba	Sr	Zr	Zr	Ga	Ga	Ga	1.944	0.753	Sr	Cd	Sn	Zr	Y	Y	Y	2.676	0.683	Sr	Sr	Sr	Ba	Sn	Sn	Zr	Hf	3.137	0.401	Ca	Ca	Ca	Sr	Sn	Ti	Ti	Zr	3.634	0.999	
Ca	Sr	Sr	Cd	Si	Sn	Sn	1.944	0.831	Sr	Zn	Zn	Cd	Si	Si	Si	Hf	2.677	0.793	Mg	Mg	Ba	Cd	Zr	Hf	Hf	Hf	3.137	0.461	Be	Zn	Zn	Zn	Ge	Zr	Hf	Hf	3.634	1.510	
Ba	Cd	Cd	Cd	Sn	Sn	Ti	1.944	0.899	Be	Ba	Ba	Zn	Sn	Sn	Ti	Ti	2.677	0.863	Mg	Mg	Sr	Ti	Ti	Al	Al	Y	3.137	0.565	Mg	Sr	Zn	Zn	Ti	Ti	Zr	Zr	3.634	1.247	
Cd	Cd	Ge	Ge	Al	In	Sc	1.945	1.057	Mg	Ca	Ca	Cd	Ge	Ge	Ge	Sn	2.677	0.654	Be	Ca	Cd	Cd	Si	Si	Zr	Zr	3.137	1.181	Mg	Ca	Zn	Si	Si	Ge	Ge	3.634	0.547		
Ca	Ca	Ge	Zr	Ga	In	In	1.945	0.802	Ba	Ba	Hf	Hf	Ga	Ga	Sc	Sc	2.677	0.784	Ca	Ba	Ba	Ba	Zn	Si	Zr	Zr	3.137	1.081	Mg	Mg	Sr	Ca	Si	Zr	Zr	Zr	3.634	1.082	
Sr	Sr	Ge	Ge	Al	Ga	Y	1.946	0.889	Ca	Ca	Zn	Zn	Si	Si	Ge	Sn	2.677	0.932	Mg	Mg	Mg	Cd	Cd	Si	Si	Sn	Zr	3.137	0.963	Ca	Ca	Ba	Si	Ge	Ti	Ti	Zr	3.635	0.579
Sr	Zn	Ge	Hf	Ga	Ga	Ga	1.946	1.043	Be	Mg	Si	Si	Ga	Ga	In	In	2.677	1.166	Ba	Ba	Cd	Cd	Ti	Ti	Ti	Hf	3.137	1.310	Be	Zn	Zn	Cd	Ge	Ti	Ti	Ti	3.635	0.845	
Ca	Ca	Sn	Ti	Ga	Ga	Y	1.947	0.824	Zn	Zn	Zn	Cd	Ge	Ge	Sn	Ti	2.678	1.112	Be	Zr	Zr	Zr	Zr	Al	In	In	Y	3.137	1.114	Be	Sr	Ba	Ba	Ti	Zr	Zr	Zr	3.635	0.546
Sr	Sr	Ge	Zr	In	In	Sc	1.947	0.838	Ba	Ti	Ti	Ti	Al	Al	In	Sc	2.678	0.916	Sr	Zn	Hf	Hf	Al	Al	Al	Sc	3.137	1.017	Ca	Ca	Ca	Ba	Ge	Ge	Ti	Zr	3.635	0.511	
Be	Sr	Ge	Ge	Ga	Ga	Sc	1.947	0.975	Ca	Ca	Si	Si	Ga	Ga	Sc	Y	2.678	1.035	Be	Mg	Zr	Zr	Zr	Ga	Ga	In	In	3.137	0.627	Be	Sr	Sr	Ba	Ge	Hf	Hf	Sc	3.635	0.888
Ba	Ba	Ge	Zr	Ga	Ga	In	1.947	0.703	Be	Be	Mg	Zn	Ge	Sn	Sn	Sn	2.678	1.076	Be	Zn	Zn	Zn	Ge	Ge	Sn	Hf	3.137	0.668	Mg	Ca	Zn	Ti	Zr	Sc	Sc	Sc	3.635	1.595	
Mg	Mg	Si	Ge	In	In	In	1.948	0.711	Sr	Ba	Be	Ge	Ge	Sc	Y	Y	2.678	0.914	Sr	Cd	Ti	Ti	Al	Al	Al	Sc	3.137	0.855	Mg	Ca	Ba	Ba	Ti	Ti	Ti	Zr	3.635	1.460	
Be	Sr	Ge	Ge	Al	Al	Ga	1.948	0.687	Ba	Be	Ge	Hf	Ga	In	In	In	2.678	1.009	Mg	Mg	Mg	Zn	Ge	Sn	Zr	3.138	0.577	Mg	Ca	Si	Zr	Zr	Al	Al	Al	3.635	1.471		
Ca	Cd	Cd	Cd	Si	Sn	Zr	1.948	0.486	Ca	Cd	Cd	Cd	Sn	Ti	Zr	Zr	2.678	1.069	Mg	Zn	Zn	Zn	Si	Ge	Ge	Sn	3.138	0.630	Be	Be	Ge	Ti	Sc	Sc	Y	Y	3.636	0.715	
Be	Mg	Ge	Ge	Ga	Ga	In	1.949	0.425	Be	Ba	Ti	Ti	In	Sc	Sc	Sc	2.678	1.604	Be	Sr	Sr	Ba	Ge	Ge	Ge	Sn	3.138	0.912	Ca	Ba	Ba	Ba	Si	Si	Sn	Ti	3.636	0.802	
Ca	Cd	Si	Si	In	In	Y	1.949	0.352	Ba	Zn	Si	Si	Ga	Y	Y	Y	2.678	0.514	Be	Be	Be	Zn	Si	Si	Sn	Zr	3.138	1.375	Be	Ca	Si	Si	Al	Al	Al	Ga	3.636	1.238	
Sr	Cd	Cd	Cd	Sn	Sn	Zr	1.949	0.765	Ca	Ba	Ti	Ti	Ti	Ga	Ga	Sc	2.679	0.541	Mg	Mg	Si	Zr	Si	Al	In	In	3.138	1.269	Be	Ca	Ba	Zn	Si	Si	Si	Hf	3.636	0.712	
Be	Mg	Sn	Sn	Al	Al	In	1.949	0.722	Ca	Zn	Si	Si	Ga	Ga	Sc	2.679	0.607	Be	Be	Zn	Cd	Ti	Ti	Hf	Hf	Hf	3.138	1.278	Be	Mg	Sr	Sr	Ge	Ge	Ge	Hf	3.636	0.739	
Ca	Ba	Sn	Zr	Ga	Ga	Ga	1.949	0.646	Ca	Sr	Cd	Cd	Ti	Ti	Ti	Zr	2.679	0.496	Ca	Sr	Zn	Zn	Ge	Zr	Zr	Zr	3.138	0.728	Mg	Mg	Hf	Hf	Al	Ga	Ga	Sc	3.636	1.266	
Be	Cd	Sn	Sn	Al	Al	Al	1.949	0.627	Be	Be	Zn	Zn	Ge	Ge	Sn	Zr	2.679	0.530	Mg	Cd	Cd	Cd	Cd	Sn	Ti	Hf	Hf	3.138	0.829	Mg	Mg	Si	Ge	Al	Al	Sc	Sc	3.636	0.782
Mg	Cd	Si	Zr	In	In	In	1.949	0.719	Mg	Sr	Sn	Hf	Y	Y	Y	Y	2.679	0.540	Mg	Mg	Sr	Cd	Ti	Ti	Zr	Zr	3.138	1.093	Mg	Mg	Sr	Sr	Ge	Sn	Zr	Zr	3.636	1.069	
Ba	Ba	Ge	Sn	Al	Al	Al	1.949	0.644	Ca	Sr	Sr	Cd	Si	Si	Zr	Zr	2.679	0.523	Mg	Mg	Ca	Ba	Si	Si	Sn	Sn	3.139	0.708	Be	Cd	Cd	Cd	Si	Si	Ti	Zr	3.637	1.482	
Be	Zn	Si	Hf	In	In	Sc	1.950	0.596	Be	Ba	Ba	Cd	Ge	Ge	Ge	Hf	2.679	0.525	Mg	Mg	Hf	Hf	Al	Al	In	In	3.139	0.800	Be	Sr	Ba	Ba	Zr	Zr	Hf	Hf	3.637	0.756	
Zn	Zn	Sn	Sn	In	Sc	Sc	1.950	0.715	Mg	Ca	Hf	Hf	In	Y	Y	Y	2.679	0.687	Mg	Mg	Hf	Hf	Ga	In	Sc	3.139	1.143	Be	Ba	Ba	Ba	Zr	Zr	Hf	Hf	3.637	1.004		
Ba	Zn	Ti	Ti	In	In	In	1.951	0.640	Be	Ba	Cd	Cd	Ge	Hf	Hf	Hf	2.679	0.563	Sr	Zn	Si	Si	Al	Al	Sc	3.139	0.779	Mg	Mg	Sr	Cd	Si	Si	Si	Ti	3.637	1.528		
Ba	Cd	Si	Si	Al	Al	In	1.951	0.870	Mg	Mg	Sr	Cd	Sn	Sn	Sn	Ti	2.679	0.541	Be	Ca	Ti	Ti	In	Sc	Sc	Sc	3.139	1.047	Be	Be	Sr	Sr	Ge	Ge	Ti	Zr	3.637	0.415	
Ca	Sr	Ge	Sn	Al	Al	Al	1.951	0.888	Ca	Cd	Si	Si	Ga	Ga	Sc	Sc	2.679	0.883	Zn	Cd	Zr	Zr	Zr	Ga	Sc	Sc	3.139	1.298	Mg	Mg	Mg	Sr	Sn	Ti	Ti	Hf	3.637	0.443	
Ba	Ba	Ge	Ge	In	Sc	Sc	1.952	0.683	Ca	Ca	Zn	Zn	Si	Si	Sn	Zr	2.679	0.543	Mg	Zn	Zn	Cd	Ge	Ge	Zr	Zr	3.139	0.738	Mg	Ca	Ca	Cd	Si	Si	Si	Ti	3.637	0.602	
Ba	Ba	Sn	Hf	Al	Al	Al	1.952	0.729	Sr	Sr	Si	Ti	Al	Al	Ga	Ga	2.679	0.472	Ba	Zn	Ti	Hf	Y	Y	Y	Y	3.139	1.014	Mg	Ca	Ca	Zn	Ti	Ti	Ti	Hf	3.637	1.727	
Mg	Ca	Cd	Cd	Ge	Ge	Sn	1.952	0.878	Ca	Sr	Si	Sn	Y	Y	Y	Y	2.679	0.714	Sr	Sr	Sr	Zn	Ti	Ti	Zr	Hf	3.139	1.367	Mg	Ca	Ca	Ba	Ti	Zr	Zr	Zr	3.637	1.590	
Mg	Cd	Ge	Ge	Ga	Ga	Ga	1.952	0.666	Sr	Ba	Ba	Cd	Si	Si	Ge	Ge	2.680	0.419	Be	Ba	Ba	Zn	Ge	Ge	Ge	Ti	3.139	0.453	Be	Zn	Zn	Si	Sn	Ti	Ti	Ti	3.637	1.405	
Mg	Sr	Ge	Ge	Ga	Ga	Sc	1.952	0.697	Ca	Ba	Ca	Cd	Si	Zr	Zr	Zr	2.680	0.462	Ca	Ca	Ba	Zn	Sn	Sn	Ti	Ti	3.139	0.518	Be	Ca	Zn	Zn	Si	Zr	Zr	Zr	3.637	1.856	
Mg	Zn	Ge	Sn	Ga	Ga	Ga	1.953	0.873	Be	Sn	Sn	Hf	Ga	Ga	In	In	2.680	0.779	Be	Sr	Ti	Hf	Sc	Sc	Sc	Sc	3.139	0.658	Be	Mg	Mg	Cd	Ge	Ge	Ti	Ti	3.637	1.618	
Ba	Ba	Cd	Cd	Ge	Ge	Ti	1.953	0.660	Ca	Cd	Cd	Cd	Ti	Ti	Zr	Hf	2.680	0.251	Sr	Zn	Hf	Hf	Al	Al	Al	Ga	3.139	0.709	Zn	Zn	Si	Ti	Ga	Sc	Sc	Sc	3.637	1.449	
Ba	Cd	Zr	Zr	In	In	In	1.953	0.644	Sr	Sr	Ge	Ti	In	Y	Y	Y	2.680	0.390	Be	Ca	Ca	Cd	Si	Si	Hf	Hf	3.140	0.630	Mg	Ca	Sr	Ba	Zr	Zr	Zr	Zr	3.638	1.000	
Zn	Z																																						

Sr	Sr	Si	Sn	Al	Al	Al	Sc	1980	0.610	Mg	Mg	Cd	Cd	Sn	Sn	Ti	HF	2.689	1.008	Be	Be	Be	Sr	Ge	Ti	Zr	Zr	3.150	0.795	Be	Be	Si	Sn	Al	Sc	Sc	Sc	3.648	0.715	
Ba	Ba	Sn	Ge	HF	Ga	Ga	Y	1980	0.593	Ca	Ba	Cd	Cd	Si	HF	HF	HF	2.689	0.676	Sr	Cd	Si	Zr	Y	Y	Y	Y	3.150	0.515	Mg	Mg	Ti	Ti	Al	Al	In	Sc	3.648	0.760	
Cd	Cd	Ge	HF	Ga	Ga	Y	Y	1980	0.567	Be	Be	Sn	Zr	Sc	Y	Y	Y	2.689	0.731	Be	Be	Be	Si	Sn	Sn	Ti	Ti	3.150	0.741	Mg	Mg	Ti	HF	Sc	Y	Y	Y	3.649	0.940	
Zn	Zn	Sn	Sn	In	Y	Y	Y	1980	0.581	Be	Ba	HF	HF	Al	Ga	Ga	Ga	2.689	0.888	Be	Be	Be	Ba	Si	Ti	Ti	HF	3.150	0.899	Mg	Ca	Ba	Zn	Ti	Ti	Ti	Ti	3.649	0.920	
Ba	Cd	Si	Si	In	In	Sc	Sc	1980	0.532	Be	Mg	Cd	Cd	Sn	Sn	Zr	Zr	2.689	0.730	Mg	Ba	Si	Zr	Al	Al	Al	Al	3.150	0.446	Be	Ca	Ca	Ba	Sn	Si	Ti	Ti	3.649	0.861	
Sr	Sr	Sn	Cd	In	Y	Y	Y	1980	0.621	Ba	Zn	Ti	Ti	Al	Al	Al	Y	2.689	0.780	Ba	Cd	Ti	HF	Sc	Sc	Sc	Sc	3.150	0.534	Mg	Mg	Ba	Ba	Si	Si	Ge	Ti	3.649	1.048	
Ca	Zn	Zn	Sn	Ge	Ge	Sn	Sn	1981	0.693	Mg	Mg	Ge	Ti	Al	Al	In	In	2.689	0.877	Ca	Ca	Zr	HF	HF	Ga	Sc	Sc	3.150	0.651	Mg	Mg	Ba	Cd	Si	Si	HF	HF	3.649	0.955	
Sr	Cd	HF	HF	In	In	In	Y	1981	0.830	Cd	Cd	Sn	Ti	Ga	Sc	Sc	Sc	2.689	0.597	Be	Be	Sn	HF	Ga	Sc	Sc	Sc	3.150	0.923	Mg	Mg	Zn	Zn	Sn	Si	Si	Ge	Zr	3.649	0.845
Mg	Mg	Ge	Sn	Sn	Ga	Ga	Y	1981	0.591	Ba	Ba	Sn	Ti	Al	Y	Y	Y	2.689	0.739	Be	Be	Ca	Zn	Ge	HF	HF	HF	3.150	0.831	Mg	Mg	Mg	Ba	Si	Sn	Ti	Ti	3.650	0.846	
Sr	Sr	Sn	HF	Al	Al	Al	In	1982	0.682	Be	Be	Sn	Sn	Ga	Sc	Sc	Y	2.690	0.877	Ca	Cd	HF	HF	Al	Al	Al	Ga	3.150	0.784	Ca	Ca	Ba	Ba	Si	Si	Ti	HF	3.650	0.806	
Ba	Ba	Si	Si	In	In	In	Sc	1982	0.815	Sr	Sr	Sr	Cd	Ti	Ti	Zr	HF	2.690	0.572	Sr	Sr	Ba	Ba	Sn	Zr	HF	3.150	1.029	Mg	Mg	Sr	Zn	Si	Si	Zr	Zr	3.650	0.804		
Ba	Ba	Cd	Cd	Si	Si	Sn	Ti	1983	0.627	Mg	Ca	Ge	Sn	Sc	Sc	Sc	Sc	2.690	0.732	Be	Be	Ca	Cd	Si	Ge	Ge	HF	3.151	0.865	Mg	Sr	Sr	Sr	Ge	Zr	Zr	HF	3.650	0.888	
Ca	Sr	Sn	Ti	Ga	In	In	In	1983	0.641	Be	Be	Sn	Sn	Al	Ga	Ga	Y	2.690	0.906	Mg	Sr	Zr	Zr	Al	Al	Al	Ga	3.151	0.831	Mg	Sr	Sr	Sr	Ge	HF	HF	HF	3.650	0.820	
Sr	Sr	Ge	Ge	In	Sc	Sc	Y	1983	0.743	Be	Ba	Zr	Zr	Ga	Ga	Ga	Y	2.690	0.901	Zn	Cd	HF	HF	Al	Al	Al	Y	3.151	0.526	Mg	Mg	Mg	Ba	Ge	Ti	Ti	Zr	3.650	0.814	
Ca	Ca	Ge	Ti	Ga	In	In	In	1984	0.555	Be	Be	Ba	Ba	Si	Sn	Sn	HF	2.690	0.914	Be	Cd	Ti	Ti	Ga	Ga	Ga	Y	3.151	0.612	Mg	Mg	Ca	Ba	Ge	Ge	HF	HF	3.651	1.031	
Be	Ca	Ca	Cd	Si	Sn	Sn	Sn	1984	0.562	Ca	Ca	Sn	HF	Al	Y	Y	Y	2.690	0.995	Mg	Cd	Cd	Cd	Si	Si	Ge	HF	3.151	0.736	Be	Ca	Si	Si	Sc	Sc	Sc	Y	3.651	0.943	
Sr	Ba	Ge	Ge	Al	Al	Al	Sc	1984	0.526	Ca	Ca	Cd	Cd	Ge	Ti	Ti	Zr	2.690	1.000	Zn	Cd	Zr	Zr	Al	Al	Sc	Sc	3.151	0.470	Be	Ba	Ba	Ba	Zr	Zr	HF	HF	3.651	0.884	
Sr	Sr	Ge	Ti	Ga	Al	In	In	1985	0.650	Be	Sr	Sr	Zn	Sn	Sn	HF	HF	2.690	1.000	Ba	Zn	Ti	HF	Al	Al	Al	Al	3.151	0.605	Be	Mg	Mg	Cd	Ge	Ti	Ti	Ti	3.651	0.868	
Sr	Sr	Sn	Zr	Ge	Al	Al	Ga	1985	0.587	Be	Ba	Zn	Zr	In	In	In	Y	2.691	0.980	Mg	Mg	Cd	Cd	Ge	Ge	Zr	HF	HF	3.151	0.806	Mg	Mg	Ba	Ba	Si	Sn	Ti	Ti	3.651	0.779
Mg	Mg	Ge	Ge	Al	In	In	Y	1986	0.520	Zn	Zn	Ge	Ge	Al	Sc	Y	Y	2.691	0.869	Mg	Mg	Sr	Zn	Ge	Ge	Ge	Sn	3.151	1.011	Mg	Mg	Mg	Zn	Zn	Ti	Ti	Zr	HF	3.651	0.811
Cd	Cd	Sn	Ti	Ga	Ga	Ga	Y	1986	1.010	Zn	Zn	HF	HF	Al	Al	In	Y	2.691	0.975	Be	Sr	Sr	Zn	Si	HF	HF	HF	3.151	0.927	Mg	Zn	Zr	Zr	Sc	Sc	Sc	Y	3.651	0.944	
Zn	Zn	Sn	Sn	Al	Ga	Sc	Sc	1986	0.914	Sr	Cd	Zr	Zr	Al	Al	Ga	Ga	2.691	0.979	Ba	Zn	Si	Zr	Sc	Sc	Sc	Sc	3.152	0.932	Be	Be	Zn	Cd	Si	Si	Si	Zr	3.651	0.793	
Cd	Cd	Sn	Zr	Al	Al	Sn	Ga	1986	0.843	Ca	Ca	Bd	Cd	Sn	Sn	Ti	Ti	2.691	0.844	Sr	Sr	Zn	Zn	Ti	Zr	Zr	HF	3.152	0.536	Be	Mg	Mg	Ba	Ge	HF	HF	HF	3.651	0.810	
Mg	Ba	Ba	Cd	Si	Si	Sn	Sn	1986	0.905	Ca	Ca	Sr	Sr	Cd	Si	Ge	Ge	2.691	0.969	Mg	Ca	Zr	HF	Ga	Ga	Ga	HF	3.152	0.670	Mg	Ba	Ba	Ba	Ba	Ge	Ti	Zr	3.651	0.860	
Ca	Ba	Sn	Ti	Ga	Ga	Ga	Ga	1987	0.922	Zn	Cd	Zr	Zr	In	In	Sc	Sc	2.691	1.033	Ba	Ba	Zn	Zr	Zr	Sc	Sc	Sc	Y	3.152	0.812	Be	Be	Ge	Zr	Al	Al	Sc	Sc	3.651	0.922
Ba	Ba	Si	Zr	In	In	In	Sc	1987	0.852	Cd	Cd	Zr	Zr	Al	In	Sc	Sc	2.691	1.305	Be	Ca	HF	HF	Al	Al	Ga	Ga	3.152	0.514	Ca	Sr	Sr	Sr	Al	Al	Sc	Ti	3.651	1.011	
Ca	Ca	Sn	Sn	Al	Sc	Y	Y	1987	0.878	Mg	Mg	Si	Sn	Ga	Ga	Sc	Sc	2.691	1.254	Mg	Ca	Ca	Cd	Ge	Ge	Ti	Ti	3.152	0.671	Be	Mg	Zr	Zr	Sc	Sc	Sc	Y	3.652	0.917	
Ca	Ca	Ge	Sn	Al	Al	Al	Sc	1987	0.919	Ba	Ba	Zn	Zr	Zr	Al	Ga	Ga	2.691	1.016	Be	Be	Sr	Sr	Si	Ge	Ge	HF	3.152	0.878	Mg	Mg	Zn	Zn	Sn	Si	Zr	Zr	HF	3.652	0.932
Ba	Ba	Si	Sn	Sn	Sc	Sc	Sc	1987	0.849	Mg	Ba	HF	HF	In	Sc	Sc	Sc	2.691	1.197	Mg	Ba	Ti	Ti	Al	Al	Al	Sc	3.152	0.554	Be	Be	Sr	Sr	Si	Ge	Zr	Zr	3.652	1.027	
Ca	Cd	Cd	Cd	Ge	Sn	Sn	Zr	1987	1.086	Mg	Sr	Ti	Ti	Ti	Ga	Ga	Y	2.691	1.237	Cd	Cd	Ti	Ti	Al	Al	Sc	Sc	Y	3.152	0.829	Ca	Ca	Ca	Sr	Ge	Sn	Ti	Ti	3.652	0.718
Be	Ca	Ca	Cd	Ge	Sn	Sn	Sn	1988	1.058	Ca	Ca	Ca	Zr	Zr	Al	In	In	Sc	2.692	1.015	Mg	Ca	Ti	Zr	Ga	Ga	Ga	3.153	0.971	Mg	Mg	Si	Zr	Al	Al	Ga	Ga	3.652	0.748	
Be	Zn	Ge	Ge	In	In	In	Sc	1988	0.885	Cd	Cd	Ti	Zr	Al	Al	Y	Y	2.692	1.174	Sr	Sr	Ge	Ti	Sc	Y	Y	Y	3.153	0.511	Be	Zn	Cd	Cd	Si	Ti	Ti	Ti	3.652	0.788	
Sr	Sr	Si	Sn	Al	Al	Al	Ga	1988	0.976	Be	Be	Ti	HF	In	In	Y	Y	2.692	1.233	Ca	Ca	Sr	Zn	Zn	Sn	Ti	Ti	3.153	0.825	Mg	Mg	Ca	Ba	Ge	HF	HF	HF	3.652	1.074	
Ba	Ba	Sn	Zr	Zr	Al	Al	In	1989	1.060	Ca	Ca	Zr	Zr	Al	In	In	Sc	2.692	0.691	Ca	Ba	Ba	Ba	Si	Ge	Sn	Sn	3.153	1.055	Mg	Cd	Si	Ti	Y	Y	Y	Y	3.653	0.957	
Mg	Ba	Ti	HF	In	In	In	In	1990	0.880	Mg	Ca	Zn	Zn	Sn	Sn	HF	HF	2.692	0.620	Ca	Ca	Ca	Zn	Si	Ge	HF	HF	3.153	0.364	Ca	Sr	Ba	Ba	Si	Si	Ge	Ge	3.653	0.745	
Sr	Zn	Sn	Ti	Ga	Ga	Ga	Ga	1990	0.948	Zn	Zn	HF	HF	Al	In	In	Sc	2.692	0.647	Be	Be	Be	Ca	Ge	Ge	Sn	Zr	3.153	0.465	Be	Ba	Ba	Ba	Ge	Ge	Sn	Zr	3.653	1.220	
Ba	Zn	Ge	Ge	Al	Al	Al	In	1990	1.055	Ca	Ca	Cd	Cd	Si	Ti	Ti	HF	2.692	0.693	Be	Be	Mg	Cd	Ti	Ti	HF	HF	3.153	0.587	Be	Zn	Zn	Zn	Sc	Sc	Sc	Zr	3.653	0.968	
Ba	Ba	Ge	Ti	Ga	Ga	Ga	Ga	1990	0.875	Sr	Zn	Ti	Zr	Ga	Ga	Ga	Ga	2.692	0.605	Be	Be	Si	Zr	Zr	Ga	Ga	In	In	3.153	0.889	Mg	Cd	Ge	Ti	Sc	Sc	Sc	Sc	3.653	0.783
Sr	Sr	Ge	Ti	In	In	Y	Y	1990	0.862	Ca	Zn	Zr	Zr	Al	Al	In	In	2.692	0.640	Ca	Zn	Zn	Zn	Si	Ti	HF	HF	3.153	0.821	Be	Sr	Ba	Ba	Zr	HF	HF	HF	3.653	0.392	
Ca	Ca	Cd	Cd	Ge	Sn	HF	HF	1991	0.915	Ba	Zn	Zr	Zr	Ga	Ga	Ga	Sc	2.693	0.606	Sr	Sr	Sr	Zn	Si	Si	Ti	HF	3.153	0.818	Ca	Zn	Ti	Zr	Al	Al	Al	Al	3.653	0.334	
Sr	Sr	Sn	HF	Ga	Ga	Sc	Sc	1991	0.880	Cd	Cd	Si	Ti	Al	Al	Ga	Ga	2.693	0.592	Cd	Cd	Si	Ti	Al	Al	Al	Ga	3.153	0.974	Mg	Mg	Mg	Zn	Sn	Zr	HF	HF	3.653	0.599	
Sr	Sr	Ge	Ge	Al	Ga	Sc	Sc	1991	0.837	Be	Be	Sn	HF	In	Y	Y	Y	2.693	0.594	Ca	Ca	Ge	Ti	Al	Y	Y	Y	3.153	0.847	Mg	Mg	Ba	Ba	Si	Si	Ti	Zr	3.653	0.395	
Ca	Cd	Sn	Si	Al	Y	Y	Y	1991	0.905	Sr	Zn	Si	Si	Al	Al	Y	Y	2.693	0.627	Be	Be	Ca	Ca	Si	Sn	Sn	HF	3.153	0.861	Be	Mg	Mg	Cd	Si	Si	Si	Sn	3.653	0.270	
Ca	Cd	Sn	Ti	Ga	Ga	Ga	Ga	1991	0.866	Cd	Cd	Ti	HF	Al	Al	In	Sc	2.693	0.492	Be	Sr	HF	HF	Al	Al	Al	Sc	3.153	0.630	Ca	Ca	Ca	Ba	Ge	Ti	Ti	HF	3.653	0.643	
Mg	Zn	Ge	Ti	In	In	In	In	1992	0.861	Ca	Ca	HF	HF	Al	Ga	In	In	2.693	0.461	Cd	Cd	Si	HF	HF	Al	Al	Al	Sc	3.153	0.721	Be	Ca	Ba	Ba	Zr	Zr	HF	HF	3.654	1.284
Ba																																								

Be	Cd	Si	Ti	In	In	In	In	2.010	1.181	Mg	Ba	Hf	Hf	Al	Y	Y	Y	2.703	0.525	Be	Cd	Si	Si	Al	Y	Y	Y	3.161	0.679	Mg	Mg	Ge	Zr	Al	Al	Al	Ga	3.665	0.889	
Ca	Ca	Zn	Cd	Sn	In	Zr	Zr	2.010	0.943	Be	Sr	Sr	Cd	Ge	Ge	Ti	Ti	2.703	0.621	Be	Ba	Si	Si	Al	Sc	Sc	Sc	3.161	0.659	Mg	Mg	Ge	Sr	Ge	Zr	Hf	3.665	0.732		
Be	Mg	Ge	Ge	In	In	Y	Y	2.011	1.040	Ca	Sr	Ge	Zr	Al	Al	Al	Al	2.703	0.566	Ca	Ba	Zn	Zn	Si	Zr	Zr	Zr	3.161	0.652	Mg	Mg	Ca	Sr	Sn	Zr	Zr	3.666	0.683		
Cd	Cd	Sn	Hf	Ga	Ga	Ga	Sc	2.011	1.166	Mg	Mg	Ge	Sn	In	Sc	Sc	Sc	2.703	0.562	Sr	Cd	Zr	Zr	Sc	Y	Y	Y	3.162	0.774	Be	Ba	Ba	Hf	Ge	Zr	Zr	3.666	0.793		
Ba	Ba	Ba	Hf	Cd	Si	Ge	Sn	2.011	0.980	Cd	Cd	Si	Hf	Ga	Ga	Sc	Sc	2.703	0.574	Be	Mg	Sr	Sr	Sn	Sn	Sn	Hf	3.162	0.684	Mg	Mg	Sr	Zn	Si	Si	Ge	3.666	0.749		
Ca	Ca	Ge	Ge	Al	In	Sc	Sc	2.011	0.995	Zn	Cd	Ti	Ti	In	Y	Y	Y	2.704	0.895	Mg	Zn	Sn	Zr	Y	Y	Y	Y	3.162	0.655	Mg	Mg	Ca	Zn	Si	Zr	Zr	3.666	0.659		
Ba	Cd	Zr	Zr	Al	In	In	In	2.011	1.084	Mg	Ba	Zn	Zn	Zn	Si	Ge	Sn	2.704	0.773	Sr	Sr	Sr	Zn	Zn	Zr	Zr	Hf	3.162	0.582	Be	Mg	Cd	Cd	Si	Si	Ti	3.666	0.817		
Mg	Zn	Ge	Ge	Ga	Ga	Ga	In	2.011	0.843	Mg	Ba	Ge	Hf	Al	Al	Al	Al	2.704	0.823	Ca	Ba	Zn	Zn	Ti	Ti	Ti	Hf	3.162	0.579	Be	Be	Si	Si	In	Sc	Sc	Y	3.666	1.185	
Sr	Zn	Ge	Zr	Ga	Ga	Ga	Ga	2.012	0.852	Sr	Sr	Sr	Cd	Sn	Zr	Zr	Hf	2.704	1.004	Sr	Zn	Zr	Zr	Sc	Sc	Sc	Y	Y	3.162	0.605	Ca	Sr	Sr	Sr	Si	Si	Sn	Ti	3.666	1.067
Sr	Zn	Cd	Cd	Sn	Sr	Zr	Zr	2.012	0.813	Mg	Ba	Ge	Si	Si	Ga	Ga	Sc	2.704	0.688	Mg	Ba	Zn	Zn	Ge	Ge	Ge	Ti	3.162	0.586	Mg	Ca	Sr	Ba	Hf	Hf	Hf	3.666	1.043		
Cd	Cd	Hf	Hf	Al	Al	Al	In	2.013	0.390	Ba	Ba	Ge	Ti	Al	Al	Y	Y	2.704	0.749	Be	Be	Mg	Cd	Ge	Ge	Ge	Zr	3.162	0.585	Mg	Mg	Ba	Ba	Zn	Ge	Ge	Ti	3.666	0.788	
Mg	Ba	Ge	Ge	Ga	Y	Y	Y	2.013	0.333	Ca	Ca	Cd	Cd	Ge	Zr	Zr	Hf	2.704	0.926	Zn	Zn	Zr	Zr	Al	Al	Al	Ga	3.162	0.641	Mg	Zn	Ge	Zr	Al	Al	Al	3.666	0.732		
Sr	Sr	Ge	Hf	Al	Al	Al	In	2.013	0.270	Sr	Ba	Ba	Cd	Ge	Ge	Ge	Hf	2.704	0.748	Ba	Ba	Ba	Zn	Sn	Ti	Ti	Hf	3.162	0.727	Be	Be	Ca	Ca	Ti	Zr	Zr	Hf	3.666	0.916	
Zn	Zn	Sn	Sn	Al	Al	Ga	Sc	2.013	0.717	Mg	Cd	Ge	Ge	Al	Y	Y	Y	2.705	0.792	Ca	Ba	Si	Si	Al	Y	Y	Y	3.162	0.642	Ca	Sr	Sr	Ba	Si	Ti	Ti	Ti	3.666	0.842	
Ba	Cd	Zr	Zr	Ga	In	In	In	2.013	0.648	Ca	Cd	Cd	Cd	Ge	Ge	Ge	Ti	2.705	0.912	Sr	Cd	Si	Si	Sc	Sc	Sc	Y	3.162	0.612	Mg	Ba	Ba	Ba	Si	Zr	Zr	Hf	3.667	0.713	
Ca	Ca	Ge	Sn	Ga	Y	Y	Y	2.013	0.583	Be	Sr	Sn	Ti	Y	Y	Y	Y	2.705	0.600	Cd	Cd	Ti	Zr	Ga	Sc	Sc	Sc	3.162	0.561	Mg	Mg	Sr	Sr	Si	Si	Ge	Zr	3.667	0.929	
Zn	Zn	Sn	Hf	Ga	Ga	Y	Y	2.013	0.592	Ca	Ba	Ge	Ge	Sc	Sc	Y	Y	2.705	0.736	Mg	Mg	Sr	Cd	Ti	Hf	Hf	Hf	3.162	0.522	Be	Be	Be	Mg	Sn	Zr	Hf	Hf	3.667	0.804	
Cd	Cd	Ti	Hf	In	In	In	Y	2.013	0.650	Sr	Sr	Ti	Hf	In	Y	Y	Y	2.705	0.911	Mg	Mg	Ti	Ti	Al	Sc	Sc	Sc	3.163	0.539	Mg	Mg	Ti	Ti	Al	Al	Ga	In	3.667	0.933	
Mg	Sr	Sn	Sn	Sc	Sc	Y	Y	2.014	0.587	Cd	Cd	Hf	Hf	Al	Sc	Y	Y	2.705	0.573	Mg	Zn	Ti	Ti	In	In	Sc	Y	3.163	0.600	Mg	Mg	Mg	Sr	Ti	Zr	Zr	Hf	3.667	1.135	
Ba	Ba	Ge	Zr	Al	Al	Ga	Ga	2.014	0.562	Sr	Ba	Hf	Hf	In	Sc	Y	Y	2.705	0.727	Al	Al	Ga	Ga	In	In	Sc	Y	3.163	0.534	Be	Ca	Ca	Sr	Si	Ge	Ge	Ge	3.667	0.838	
Cd	Cd	Sn	Hf	Al	Al	Y	Y	2.014	0.646	Cd	Cd	Zr	Hf	Al	Y	Y	Y	2.705	1.107	Ba	Cd	Zr	Hf	Sc	Sc	Sc	Sc	3.163	0.571	Be	Zn	Zn	Zn	Ge	Ti	Hf	Hf	3.667	0.911	
Mg	Ca	Sn	Sn	Al	Al	Sc	Sc	2.015	0.583	Sr	Ba	Hf	Hf	Ga	Ga	Sc	Sc	2.705	0.916	Be	Sr	Sr	Cd	Si	Si	Si	Hf	3.163	0.544	Sr	Sr	Sr	Ba	Si	Si	Ge	Hf	3.667	1.166	
Sr	Zn	Ti	Zr	In	In	In	In	2.015	0.802	Be	Cd	Cd	Hf	Y	Y	Y	Y	2.706	0.929	Ca	Ba	Ba	Zn	Ge	Ge	Ge	Hf	3.163	0.647	Be	Be	Ca	Ca	Si	Si	Ge	Hf	3.667	0.586	
Be	Ba	Hf	Hf	In	In	Y	Y	2.015	0.790	Be	Zn	Sn	Cd	Si	Si	Zr	Hf	2.706	1.047	Ba	Zn	Zn	Zn	Ge	Ge	Ge	Sn	3.163	0.700	Mg	Mg	Ge	Zr	Al	Sc	Sc	Sc	3.667	0.606	
Ba	Ba	Sn	Ti	Al	Al	Al	Y	2.015	0.616	Ca	Zn	Cd	Cd	Si	Si	Hf	Hf	2.706	1.020	Be	Be	Be	Zn	Ge	Ti	Hf	Hf	3.163	0.563	Be	Be	Ca	Sr	Ge	Ti	Ti	Ti	3.667	0.702	
Ca	Ca	Sn	Zr	Ga	Ga	Ga	In	2.016	0.672	Ba	Cd	Cd	Si	Si	Al	Al	Ga	2.706	1.009	Be	Cd	Si	Hf	Y	Y	Y	Y	3.163	0.655	Be	Ba	Ba	Ba	Ge	Sn	Hf	3.668	1.019		
Mg	Ba	Cd	Cd	Sn	Sn	Sn	Zr	2.017	0.784	Be	Be	Mg	Zn	Sn	Sn	Sn	Hf	2.706	1.029	Ca	Ba	Si	Si	Al	Al	Sc	Sc	3.163	0.750	Be	Be	Mg	Mg	Si	Ge	Sn	Sn	3.668	0.992	
Ba	Ba	Zn	Zn	Zn	Ge	Sn	Sn	2.017	0.603	Ba	Ba	Zn	Zn	Si	Ti	Hf	Hf	2.707	0.873	Be	Sr	Sr	Zn	Si	Zr	Zr	Zr	3.163	0.444	Be	Be	Ti	Hf	In	Sc	Sc	Sc	3.668	0.933	
Ba	Cd	Ti	Ti	In	In	In	Sc	2.017	0.641	Ba	Ba	Ba	Cd	Si	Ti	Ti	Zr	2.707	0.969	Be	Sr	Ti	Ti	Al	Sc	Sc	Sc	3.164	0.499	Mg	Zn	Zn	Zn	Ge	Zr	Zr	Hf	3.668	1.121	
Be	Ba	Ge	Sn	Al	Al	Al	Al	2.018	0.779	Be	Cd	Ge	Ti	Ga	Ga	Ga	Y	2.707	1.027	Be	Be	Ba	Cd	Si	Si	Ge	Ge	Ti	3.164	0.571	Be	Ca	Ca	Ba	Si	Si	Sn	Sn	3.668	1.016
Mg	Mg	Sn	Hf	In	Y	Y	Y	2.018	0.598	Be	Ca	Si	Si	Ga	Ga	Ga	Y	2.707	0.845	Sr	Zn	Hf	Hf	Sc	Y	Y	Y	Y	3.164	0.734	Be	Mg	Mg	Ba	Ge	Zr	Zr	Zr	3.668	0.919
Zn	Cd	Ge	Ge	Al	Al	Ga	Ga	2.018	0.591	Ba	Ba	Zr	Hf	In	Sc	Sc	Sc	2.708	0.961	Mg	Mg	Zr	Zr	In	Sc	Y	Y	3.164	0.726	Mg	Ca	Ca	Zn	Ti	Ti	Zr	Zr	3.668	0.904	
Mg	Cd	Si	Si	In	In	In	Y	2.018	0.653	Zn	Zn	Zn	Cd	Ge	Sn	Zr	Zr	2.708	1.105	Ca	Ca	Si	Zr	Al	Al	Al	Ga	3.164	0.713	Be	Ca	Ba	Ge	Ge	Ti	Ti	Ti	3.668	0.853	
Mg	Zn	Sn	Sn	Ga	Ga	Sc	Sc	2.018	0.584	Zn	Zn	Cd	Cd	Si	Sn	Zr	Zr	2.708	1.341	Mg	Mg	Ba	Ba	Ge	Sn	Sn	Hf	3.164	0.827	Mg	Mg	Mg	Zn	Sn	Ti	Hf	Hf	3.668	0.876	
Zn	Cd	Sn	Hf	Ga	Ga	Ga	Ga	2.019	0.564	Mg	Cd	Si	Hf	Al	In	In	In	2.708	1.279	Zn	Zn	Cd	Cd	Si	Zr	Zr	Hf	3.164	0.751	Ca	Ca	Ca	Sr	Ge	Ge	Sn	Ti	3.669	0.935	
Zn	Cd	Ti	Al	Al	In	In	In	2.019	0.642	Mg	Ca	Cd	Cd	Ge	Ge	Ge	Hf	2.708	1.085	Ca	Ca	Ba	Ba	Si	Si	Si	Sn	3.164	0.696	Be	Be	Ge	Zr	Ga	Sc	Sc	Sc	3.669	0.851	
Sr	Cd	Si	Si	Al	Al	In	In	2.019	0.569	Sr	Sr	Sr	Zn	Si	Ge	Sn	2.708	1.219	Zn	Zn	Ge	Zr	Al	Al	Al	Ga	3.164	0.668	Be	Ba	Ba	Ba	Si	Ti	Zr	Zr	3.669	0.885		
Sr	Cd	Hf	Hf	Al	In	In	In	2.019	0.609	Ca	Cd	Zr	Zr	Ga	Ga	Ga	Y	2.708	1.248	Ca	Ca	Si	Hf	Ga	Sc	Sc	Sc	3.164	0.644	Be	Sr	Zn	Zn	Si	Ti	Ti	Ti	3.669	1.105	
Ca	Ba	Cd	Cd	Sn	Sn	Ti	Ti	2.019	0.622	Sr	Sr	Sr	Cd	Ge	Zr	Zr	Hf	2.708	1.082	Ca	Sr	Sr	Cd	Si	Si	Si	Ti	3.164	0.638	Mg	Zn	Ti	Ti	In	Sc	Sc	Sc	3.669	1.008	
Ca	Zn	Cd	Cd	Si	Si	Sn	Sn	2.020	0.524	Ca	Ca	Zn	Cd	Sn	Zr	Zr	Zr	2.708	1.193	Mg	Sr	Zn	Zn	Ge	Ge	Ti	Ti	3.164	0.679	Be	Mg	Ca	Sr	Ge	Ge	Ge	Ge	3.669	0.961	
Ba	Ba	Sn	Zr	Al	Al	Al	Sc	2.020	0.890	Ca	Sr	Cd	Cd	Si	Ti	Ti	Ti	2.708	1.241	Zn	Cd	Ge	Ti	Y	Y	Y	Y	3.164	0.644	Mg	Mg	Mg	Sr	Si	Ge	Ge	Zr	3.669	0.930	
Ba	Ba	Si	Hf	Al	In	In	In	2.020	0.883	Mg	Mg	Ba	Ba	Zn	Ge	Ge	Sn	2.708	0.747	Zn	Zn	Si	Ge	Sc	Sc	Y	Y	3.164	0.648	Be	Be	Sr	Ba	Ge	Ge	Ge	Ti	Ti	3.669	0.834
Sr	Sr	Si	Hf	Al	In	In	In	2.020	0.773	Ca	Zn	Cd	Cd	Ti	Ti	Ti	Hf	Hf	2.708	0.666	Ca	Sr	Sr	Sr	Si	Ge	Sn	Sn	3.164	0.780	Be	Mg	Sr	Sr	Ti	Ti	Ti	Zr	3.669	0.889
Mg	Mg	Ge	Ge	Ga	In	Y	Y	2.021	0.745	Be	Sr	Cd	Cd	Ge	Ge	Ge	Hf	2.709	0.692	Be	Be	Si	Ge	Al	In	In	In	3.164	0.696	Mg	Sr	Sr	Sr	Ge	Ge	Sn	Zr	3.670	0.997	
Ca	Ca	Ba	Cd	Si	Sn	Sn	Sn	2.021	0.877	Be	Bz	Zn	Zn	Sn	Sn	Sn	Ti	2.709	0.749	Ca	Zn	Zn	Zn	Sn	Ti	Ti	Hf	3.165	0.647	Ca	Ca	Ba	Ba	Zr	Hf	Hf	Hf	3.670	0.835	
Cd	Cd	Ti	Ti	In	In																																			

Ba	Ba	Zn	Cd	Si	Si	HF	HF	2.046	0.734	Mg	Zn	Ge	HF	Ga	Ga	Ga	2.717	0.846	Be	Cd	Si	Si	Al	Al	Ga	Ga	3.173	0.456	Mg	Zn	Zn	Cd	Si	Si	Si	Zr	3.681	1.298	
Mg	Ca	Ge	Ge	Al	Ga	Ga	Ga	2.046	0.734	Be	Be	Sr	Cd	Ge	Ge	Ge	Zr	2.718	0.882	Sr	Ba	Ba	Zn	Ti	Zr	Zr	3.173	0.609	Be	Be	Mg	Ca	Zr	Zr	HF	HF	3.681	1.227	
Sr	Sr	Sn	Zr	Al	Al	Al	In	2.046	0.598	Ba	Ba	Zn	HF	Al	Al	Al	Sc	2.718	0.780	Ba	Ba	Zn	Ti	Al	Al	Sc	3.173	0.445	Mg	Ca	Sr	Sr	Ge	Zr	Zr	3.681	1.062		
Be	Sr	Sn	Zn	Ge	Ga	Ga	Ga	2.047	0.643	Be	Be	Sn	Ti	Ga	In	In	In	2.718	0.840	Mg	Ca	Cd	Cd	Ti	Ti	Ti	3.173	0.405	Be	Mg	Mg	Zn	Si	HF	HF	HF	3.681	0.357	
Ba	Ba	Zn	Zn	Zn	Ge	Sn	Sr	2.047	0.698	Be	Ba	Sn	HF	HF	Al	In	In	2.718	0.809	Be	Be	Be	Cd	Si	Ti	Zr	3.173	0.653	Sr	Sr	Sr	Ba	Si	Ge	Ge	Zr	3.681	0.575	
Be	Sr	Sr	Zn	Si	Sn	Sn	Sn	2.047	0.605	Ca	Zn	Ti	Ti	Al	Al	In	In	2.718	0.660	Be	Be	Sr	Cd	Ti	Ti	Ti	3.173	0.784	Be	Mg	Mg	Ca	Si	Si	Sn	Sn	3.681	0.730	
Sr	Sr	Si	Ti	In	In	In	Sc	2.047	0.808	Be	Ba	Sn	Ti	Sc	Sc	Sc	Sc	2.718	0.629	Mg	Mg	Sr	Cd	Ti	Ti	Ti	HF	3.173	0.672	Be	Sr	Ba	Ba	Si	HF	HF	HF	3.682	0.542
Mg	Mg	Si	Ge	Ga	In	In	In	2.047	0.825	Ca	Ca	Sn	Zr	Sc	Sc	Sc	Y	2.718	0.831	Mg	Zn	Zn	Zn	Ge	Sn	HF	HF	3.173	0.706	Be	Cd	Si	Si	Al	Al	Sc	Sc	3.682	0.748
Sr	Ba	Cd	Cd	Ge	Ge	Ge	HF	2.047	0.723	Sr	Ba	Zr	Zr	Al	Al	Ga	Ga	2.719	0.655	Mg	Cd	Sn	Ti	Y	Y	Y	3.173	0.466	Be	Be	Mg	Cd	Si	Si	Si	HF	3.682	0.774	
Be	Mg	Sn	Ga	Y	Y	Y	Y	2.048	0.656	Sr	Sr	Ba	Cd	Ge	Ge	HF	HF	2.719	0.623	Be	Be	Be	Ba	Si	Ti	Zr	3.173	0.436	Be	Mg	Sr	Sr	Ge	HF	HF	HF	3.682	0.448	
Zn	Zn	Sn	Sn	Ga	Sc	Sc	Y	2.048	0.820	Zn	Zn	Ge	HF	Ga	Ga	Sc	Sc	2.719	0.881	Be	Be	Cd	Cd	Si	Ti	Zr	3.174	0.580	Mg	Mg	Mg	Ba	Ge	Ge	Ti	Zr	3.682	0.808	
Ba	Ba	Si	HF	Ga	In	In	In	2.048	0.730	Be	Ca	Zn	Zn	Sn	Sn	HF	HF	2.719	0.860	Sr	Zn	HF	HF	Sc	Sc	Y	3.174	0.469	Mg	Sr	Sr	Sr	Ti	Zr	HF	HF	3.682	1.113	
Zn	Zn	Si	Ge	Ga	Ga	Ga	In	2.048	0.625	Zn	Zn	Zn	Al	Ga	Ga	Ga	2.719	0.854	Ca	Ca	Si	Ti	Ga	Y	Y	Y	3.174	0.399	Mg	Mg	Mg	Zn	Sr	Zr	Zr	HF	3.682	0.603	
Sr	Ba	Cd	Cd	Si	Ge	Ge	Ge	2.048	0.817	Ba	Ba	Zn	Zn	Sn	Zr	Zr	HF	2.719	0.178	Be	Be	Cd	Cd	Ge	Ge	Ti	HF	3.174	0.625	Be	Ca	Sr	Sr	Sn	Ti	Ti	Ti	3.682	0.974
Ba	Ba	Zn	Cd	Ge	Ge	Ge	HF	2.048	0.728	Be	Be	Be	Be	Ge	Ge	Sn	HF	2.719	0.064	Ca	Cd	Si	Ge	Sc	Sc	Sc	3.175	0.484	Mg	Sr	Ca	Sr	Sn	Ti	Ti	HF	3.683	1.170	
Zn	Cd	Zr	Zr	Zr	Ga	In	In	2.049	0.949	Be	Ca	Zr	Zr	Ga	Ga	In	In	2.719	0.044	Be	Cd	Zr	Zr	Ga	Sc	Sc	3.175	0.619	Be	Be	Ca	Sr	Sr	Zr	Zr	HF	3.684	0.303	
Ba	Ba	Ge	Zr	Ga	Ga	Ga	Sc	2.049	0.899	Mg	Mg	Cd	Cd	Si	Si	Sn	HF	2.719	0.462	Sr	Sr	Ba	Ba	Si	Ge	Sn	3.175	0.735	Be	Be	Be	Zr	Zr	Al	Ga	Ga	Y	3.684	0.374
Mg	Zn	Sn	Sn	Ga	Y	Y	Y	2.049	0.643	Sr	Sr	Zr	HF	Ga	Y	Y	Y	2.719	0.103	Be	Mg	Ti	Ti	In	In	Sc	3.175	0.469	Be	Be	Ca	Zn	Ge	Ge	Ti	Ti	3.684	0.315	
Cd	Cd	Zr	HF	Ga	Ga	In	In	2.050	0.795	Sr	Sr	Sr	Cd	Si	Zr	Zr	HF	2.719	0.001	Zn	Zn	Cd	Cd	Si	Zr	HF	3.175	0.580	Mg	Mg	Si	Zr	Al	Al	Al	Y	3.684	1.233	
Mg	Zn	Cd	Cd	Si	Sn	Sn	Sn	2.050	0.888	Ca	Ca	Ti	Zr	Ga	Ga	Ga	Y	2.719	0.465	Mg	Cd	Cd	Cd	Si	Si	Ge	Zr	3.175	0.799	Mg	Mg	Ge	Ti	Al	Al	Sc	Sc	3.684	1.079
Be	Zn	Ge	Zr	In	In	In	In	2.051	0.628	Zn	Cd	Ti	HF	Ga	Ga	Ga	2.719	0.090	Mg	Cd	Cd	Cd	Sn	Ti	Zr	Zr	3.175	0.367	Be	Ca	Zr	HF	Al	Al	Al	Al	3.684	0.880	
Ba	Cd	Cd	Cd	Si	Ge	HF	HF	2.052	0.764	Be	Ba	Zr	Zr	Ga	Sc	Sc	Sc	2.719	0.023	Ca	Cd	Si	Si	Al	Y	Y	Y	3.175	0.401	Be	Ba	Ba	Ti	Ti	Ti	Ti	Ti	3.684	1.491
Cd	Cd	Ti	Zr	Ga	Ga	In	In	2.052	0.885	Ca	Ca	Sn	Ti	Al	Al	Al	Ga	2.719	0.660	Ca	Zn	Si	Ge	Y	Y	Y	Y	3.175	0.539	Be	Sr	Ba	Ba	Si	Ti	Ti	Ti	3.684	1.302
Ca	Ca	Si	Ti	In	In	In	Y	2.052	0.624	Sr	Sr	Ge	Ti	Al	Al	Y	Y	2.720	0.041	Ca	Ba	Zn	Zn	Ti	Ti	Ti	Zr	3.175	0.776	Be	Sr	Ba	Ti	Ti	Ga	In	Sc	3.685	0.922
Sr	Cd	Cd	Cd	Sn	Ti	HF	HF	2.052	0.604	Be	Mg	Si	Ti	In	In	In	In	2.720	-0.002	Mg	Mg	Ba	Ba	Ge	Sn	Sn	Zr	3.175	0.757	Be	Mg	Ba	Ba	Si	Ti	Ti	Ti	3.685	0.617
Sr	Sr	Ge	Zr	Al	Ga	Ga	Ga	2.053	0.726	Be	Ba	Cd	Cd	Ge	Ge	Ge	Zr	2.720	0.689	Ca	Ba	Zn	Zn	Si	Si	Si	Ti	3.175	0.781	Be	Be	Mg	Ca	Ge	HF	HF	HF	3.685	0.752
Ca	Ca	Ge	Sn	Al	Al	Y	Y	2.053	0.640	Ca	Ba	Ti	Zr	Ga	Ga	Ga	2.720	0.032	Ba	Ba	Ba	Zn	Ge	Ti	Ti	Zr	3.176	0.843	Be	Be	Zr	Ca	Al	Al	Ga	Y	3.685	0.670	
Sr	Zn	Zn	Zn	Si	Ge	Sn	Sn	2.053	0.574	Ca	Ca	Sn	Ti	In	Sc	Sc	Sc	2.720	-0.006	Ca	Ca	Ge	Ti	Sc	Sc	Sc	Y	3.176	0.735	Mg	Ca	Zr	Sr	Sn	Zr	Zr	Zr	3.685	0.733
Ca	Ca	Cd	Cd	Ge	Ge	Sn	Zr	2.053	0.719	Be	Be	Be	Sr	Si	Ge	Sn	Sn	2.720	0.525	Be	Be	Ca	Ca	Si	Sn	Sn	Zr	3.176	0.801	Be	Sr	Sr	Ba	Ti	Ti	Zr	Zr	3.685	0.919
Ba	Ba	Ge	Sn	Sc	Sc	Sc	Y	2.053	0.629	Sr	Ba	Zr	Zr	Ga	Y	Y	Y	2.720	0.280	Mg	Mg	Cd	Cd	Ge	Zr	Zr	HF	3.176	0.641	Mg	Mg	Mg	Sr	Si	Zr	Zr	HF	3.685	0.733
Cd	Cd	Ge	Zr	Al	Ga	Ga	Ga	2.053	0.599	Sr	Sr	Ge	Zr	Sc	Sc	Sc	Y	2.720	0.203	Sr	Sr	Sr	Zn	Si	Si	Ge	HF	3.176	0.624	Mg	Zn	Zn	Zn	Si	Ti	HF	HF	3.686	1.622
Ca	Ca	Sr	Cd	Si	Sn	Sn	Sn	2.054	0.621	Ba	Ba	Ba	Cd	Ge	Ti	HF	2.720	0.516	Mg	Mg	Sr	Ba	Sn	Sn	Ga	Ti	3.176	0.744	Mg	Sr	Ba	Ti	Ti	Ti	HF	3.686	1.574		
Sr	Cd	Cd	Cd	Si	Si	Ge	Sn	2.054	0.536	Cd	Ti	Ti	Ti	Ga	Sc	Y	2.720	0.277	Mg	Cd	HF	HF	Si	Ga	Ga	Sc	3.176	0.603	Mg	Mg	Ca	Zn	Ti	HF	HF	HF	3.686	1.410	
Mg	Sr	Si	Si	Ga	Ga	In	In	2.054	0.947	Ba	Ba	Ba	Zn	Zn	Ge	Ti	Zr	2.720	0.244	Be	Be	Be	Ba	Ge	Ge	Zr	HF	3.176	0.583	Mg	Mg	Ba	Zn	Si	Ti	Ti	Ti	3.686	0.753
Mg	Sr	Cd	Cd	Sn	Sn	Sn	HF	2.054	0.903	Mg	Ba	Ti	Ti	Ti	Ga	Ga	Ga	2.721	0.693	Mg	Mg	Sr	Cd	Ti	Zr	Zr	Zr	3.176	0.793	Be	Mg	Zr	HF	Ga	Ga	Ga	Ga	3.687	0.999
Mg	Ba	Ba	Zn	Zn	Ge	Sn	Sn	2.054	0.743	Mg	Mg	Ca	Zn	Si	Sn	Sn	Sn	2.721	0.211	Ca	Ca	Si	Si	Al	Al	Sc	Y	3.176	0.766	Mg	Ca	Sr	Sr	Ge	Ge	Zr	Zr	3.687	1.106
Ba	Ba	Ge	HF	Al	Al	Y	Y	2.055	0.777	Ca	Sr	Sn	HF	Y	Y	Y	Y	2.721	0.219	Sr	Ba	Si	Si	Al	Al	Sc	Sc	3.177	0.665	Be	Mg	Sr	Sr	Ge	Zr	Zr	Zr	3.687	0.881
Ca	Zn	Si	Si	In	In	In	Sc	2.055	0.890	Ca	Ca	Ca	Cd	Ge	Ge	Sn	HF	2.720	0.720	Sr	Ti	Zr	Zr	Sc	Sc	Y	Y	3.177	0.699	Be	Be	Mg	Cd	Si	Si	Ge	Ge	3.687	1.150
Ca	Ca	Si	Ge	Ga	Ga	Ga	Sc	2.055	0.722	Zn	Zn	Ti	Ti	Ga	Ga	In	Y	2.721	0.198	Ca	Ca	Zr	HF	Al	Al	Sc	Sc	3.177	0.591	Ca	Ca	Ca	Sr	Ge	Ge	Ti	HF	3.687	1.137
Ba	Cd	Zr	Zr	In	In	Y	Y	2.055	0.744	Ba	Zn	HF	HF	Ga	Y	Y	Y	2.721	0.215	Ba	Ba	Zn	Ti	Ti	Ga	Sc	Sc	3.177	0.548	Ca	Ca	Sr	Ba	Ge	Ge	Ge	Zr	3.688	0.829
Be	Ba	Zr	Zr	In	In	Y	Y	2.056	0.886	Sr	Cd	Zr	Zr	Ga	Ga	Sc	Sc	2.721	0.602	Mg	Ca	Si	Si	Al	Al	Ga	Ga	3.177	0.623	Mg	Mg	Ba	Ba	Si	Ge	HF	HF	3.688	1.194
Sr	Sr	Ti	HF	In	In	In	Y	2.056	0.717	Ba	Ba	Ba	Cd	Sn	Ti	Ti	Zr	2.721	0.701	Ca	Ca	Zn	Zn	Ge	Ti	Ti	Zr	3.177	0.591	Mg	Mg	Sr	Sr	Si	Zr	HF	HF	3.688	1.451
Be	Sr	Sr	Zn	Ge	Sn	Sn	Sn	2.056	0.568	Zn	Zn	Si	HF	In	In	Sc	Sc	2.721	0.699	Be	Cd	Zr	Zr	Al	Al	Al	In	3.177	0.520	Be	Be	Be	Ca	Ge	Ti	Zr	3.688	0.927	
Be	Be	Ge	Sn	Ga	In	In	In	2.056	0.702	Mg	Ca	Ca	Cd	Sn	Sn	Sn	Ti	2.721	0.754	Ba	Ba	Sn	Si	Sc	Sc	Sc	Y	3.177	0.676	Mg	Zn	Ti	Ti	Sc	Sc	Y	Y	3.688	1.339
Cd	Cd	Si	Si	Ga	Ga	In	Y	2.056	0.728	Be	Be	Ge	Sn	Al	Al	Y	Y	2.721	0.643	Zn	Zn	Cd	Cd	Ge	Ti	Ti	HF	3.177	0.599	Mg	Cd	Ti	Ti	Sc	Sc	Sc	Y	3.689	1.496
Ba	Cd	Si	Si	Al	Ga	Ga	Y	2.056	0.535	Be	Be																												

Sr	Cd	Cd	Cd	Sn	Sn	Ti	Zr	2.072	0.394	Sr	Zn	Zn	Cd	Si	Si	Ti	Ti	2.729	0.912	Be	Be	Be	Ca	Sn	Sn	Zr	Hf	3.186	0.871	Be	Be	Si	Ti	Ga	Ga	In	3.702	0.631		
Cd	Cd	Zn	Zr	Ga	Ga	Ga	Sc	2.072	0.299	Cd	Cd	Si	Ge	Ga	Sc	Sc	Sc	2.729	0.905	Be	Ba	Si	Ti	Al	Sc	Sc	Sc	3.186	0.550	Be	Ca	Ba	Ba	Si	Hf	Hf	3.702	0.451		
Ba	Ba	Zn	Zn	Ge	Ge	Ge	Sc	2.072	0.312	Ba	Ba	Ba	Cd	Si	Ge	Ge	Ti	2.729	0.999	Mg	Sr	Si	Hf	Y	Y	Y	Y	3.187	0.588	Be	Mg	Hf	Hf	Al	Ga	Ga	3.702	0.476		
Be	Ba	Cd	Cd	Si	Si	Sn	Sn	2.072	0.387	Ca	Zn	Hf	Hf	Al	Ga	Ga	Ga	2.729	1.117	Ca	Sr	Ba	Ba	Si	Si	Sn	Sn	3.187	0.746	Mg	Zn	Zn	Zn	Sn	Ti	Ti	Zr	3.702	0.575	
Ca	Ca	Ge	Ge	Al	Al	Al	Sc	2.072	0.296	Ca	Cd	Hf	Hf	Al	Ga	Ga	Ga	2.729	1.283	Be	Be	Be	Ba	Si	Si	Ge	Hf	3.187	0.515	Be	Zn	Be	Al	Ga	Ga	Ga	3.702	0.689		
Mg	Ca	Si	Si	Ti	Ti	Ga	In	2.073	0.293	Be	Ba	Ti	Ti	Al	Ga	Y	Y	2.729	1.265	Be	Cd	Sn	Hf	Al	Al	Al	Al	3.187	0.542	Be	Sr	Ca	Ba	Zr	Zr	Hf	Hf	3.702	0.604	
Ca	Ca	Sn	Sn	Ti	Ti	Ga	In	2.073	0.384	Be	Ca	Ba	Ba	Ge	Sn	Sn	Sn	2.729	1.020	Mg	Mg	Zr	Zr	Al	Al	Ga	In	3.187	0.798	Ca	Ca	Ca	Ba	Zi	Ti	Ti	Zr	3.703	0.703	
Ba	Ba	Si	Zr	Al	Al	In	Sc	2.074	0.294	Ba	Ba	Si	Ti	Ti	Ga	Sc	Sc	2.729	1.155	Ca	Ca	Ti	Zr	Al	Y	Y	Y	3.188	0.569	Al	Ga	In	Sc	Y	Y	Y	Y	3.703	0.700	
Be	Ca	Sn	Sn	Al	Al	Al	Sc	2.074	0.826	Sr	Sr	Sn	Ti	Al	Y	Y	Y	2.730	1.265	Ca	Ba	Ti	Ti	Sc	Sc	Sc	Sc	3.188	0.763	Ca	Ca	Sr	Sr	Si	Ti	Ti	Zr	3.703	0.499	
Sr	Ba	Si	Si	Ga	Ga	In	In	2.074	0.655	Be	Be	Be	Ba	Si	Sn	Ti	Ti	2.730	0.998	Sr	Sr	Si	Hf	Sc	Y	Y	Y	3.188	0.884	Be	Be	Sr	Ba	Si	Ti	Ti	Ti	3.703	0.573	
Cd	Zn	Sn	Sn	Al	Al	Y	Y	2.075	0.332	Sr	Zn	Zn	Zn	Si	Si	Ge	Zr	2.730	1.124	Sr	Sr	Ba	Ba	Zn	Si	Si	Ti	3.188	0.516	Be	Ba	Zn	Zn	Ti	Hf	Hf	Hf	3.703	0.492	
Zn	Cd	Sn	Zr	Ga	Ga	Ga	Y	2.075	0.537	Ca	Ba	Zn	Zn	Ge	Ge	Ti	Ti	2.730	1.260	Be	Be	Mg	Ba	Ge	Ge	Ge	Sn	3.188	0.713	Be	Mg	Mg	Ba	Ti	Ti	Hf	Hf	3.704	0.698	
Mg	Ba	Si	Si	Ga	Ga	Ga	In	2.075	0.641	Zn	Cd	Ge	Ge	Sc	Sc	Y	Y	2.730	0.871	Mg	Zn	Si	Si	Ge	Y	Y	Y	3.188	0.954	Mg	Ca	Zn	Zn	Ti	Ti	Hf	Hf	3.704	0.550	
Zn	Zn	Ge	Ti	Ti	Ga	Ga	In	2.075	0.312	Sr	Cd	Si	Si	Ga	Y	Y	Y	2.730	0.852	Zn	Zn	Si	Si	Al	Ga	Ga	Sc	3.188	0.427	Be	Sr	Sr	Ba	Ge	Ge	Zr	Zr	3.704	0.273	
Be	Mg	Zn	Zn	Ge	Sn	Sn	Sn	2.075	0.517	Mg	Zn	Cd	Cd	Sn	Sn	Zr	Zr	2.730	0.878	Mg	Mg	Ca	Cd	Ge	Ge	Ge	Hf	3.188	0.489	Mg	Mg	Ca	Ba	Si	Zr	Zr	Zr	3.705	0.967	
Mg	Mg	Ge	Ge	In	In	Sc	Y	2.075	0.637	Ba	Cd	Cd	Ti	Sc	Sc	Sc	Sc	2.730	0.857	Be	Ca	Si	Hf	Y	Y	Y	Y	3.189	0.642	Mg	Mg	Si	Ti	Al	Y	Y	Y	3.705	0.747	
Sr	Sr	Ge	Zr	Al	Al	In	In	2.075	0.308	Sr	Zn	Zn	Zn	Ge	Ge	Ti	Hf	2.730	0.831	Ca	Ca	Ba	Zn	Si	Ge	Ge	Ge	3.189	0.925	Be	Mg	Mg	Sr	Sn	Sn	Ti	Ti	3.705	0.326	
Be	Ba	Hf	Hf	Ga	In	In	In	2.075	0.513	Be	Ba	Ba	Zn	Si	Si	Si	Sn	2.730	0.868	Be	Ca	Ba	Zn	Sn	Zr	Zr	Zr	3.189	0.886	Ca	Ca	Sr	Ba	Si	Si	Ti	Ti	3.705	0.011	
Sr	Zn	Ge	Ge	In	Y	Y	Y	2.075	0.549	Cd	Cd	Si	Ge	Al	Al	Al	Y	2.730	0.885	Ca	Zn	Ti	Ti	Al	Al	Ga	Ga	3.189	0.912	Mg	Mg	Ti	Zr	Al	Ga	Ga	Ga	3.705	0.058	
Sr	Sr	Si	Zr	Al	In	In	In	2.075	0.232	Ba	Ba	Ba	Cd	Ge	Ti	Ti	Zr	2.730	0.880	Zn	Zn	Ti	Ti	Hf	Ga	Ga	Sc	3.189	0.983	Mg	Ca	Ba	Ba	Ge	Hf	Hf	Hf	3.706	0.031	
Be	Be	Ba	Cd	Sn	Sn	Sn	Hf	2.075	0.495	Mg	Mg	Sn	Hf	In	Y	Y	Y	2.730	0.884	Mg	Mg	Ba	Ba	Si	Ge	Ge	Sn	3.189	0.864	Mg	Mg	Zn	Zn	Si	Ge	Ti	Ti	3.706	0.176	
Ba	Cd	Ge	Ge	Al	Al	Sc	Sc	2.075	0.542	Sr	Sr	Hf	Hf	Ga	Sc	Y	Y	2.730	0.617	Mg	Zn	Hf	Hf	Ga	Ga	Ga	Y	3.189	0.942	Mg	Ca	Ba	Ti	Ti	Hf	Hf	Hf	3.706	0.204	
Sr	Zn	Zn	Zn	Si	Sn	Sn	Hf	2.076	0.221	Be	Cd	Si	Si	In	Y	Y	Y	2.730	0.551	Mg	Cd	Sn	Sc	Sc	Sc	Sc	Sc	3.189	0.719	Be	Mg	Mg	Ba	Zr	Zr	Hf	Hf	3.706	0.083	
Ca	Zn	Cd	Cd	Sn	Sn	Sn	Ti	2.076	0.656	Cd	Cd	Zr	Zr	Al	Al	Ga	Y	2.731	0.595	Be	Be	Mg	Cd	Zr	Zr	Hf	Hf	3.189	0.746	Be	Ca	Ba	Ba	Si	Si	Ge	Ge	3.706	1.078	
Zn	Zn	Cd	Al	Al	In	In	In	2.076	0.663	Sr	Ba	Ba	Cd	Ti	Hf	Hf	Hf	2.731	0.636	Mg	Ba	Zn	Zn	Si	Si	Ge	Ge	3.189	0.884	Mg	Mg	Mg	Sr	Si	Ge	Zr	Zr	3.706	0.993	
Sr	Cd	Cd	Cd	Si	Sn	Zr	Zr	2.076	0.199	Sr	Ba	Ba	Cd	Ti	Zr	Zr	Zr	2.731	0.475	Be	Ca	Si	Si	In	Sc	Sc	Sc	3.190	0.644	Mg	Ca	Ba	Sc	Ge	Hf	Hf	Hf	3.706	0.838	
Cd	Cd	Ge	Sn	Al	Y	Y	Y	2.076	0.675	Sr	Sr	Ge	Hf	Al	Sc	Sc	Sc	2.731	0.457	Be	Mg	Sr	Sr	Ge	Ge	Ge	Sn	3.190	0.696	Be	Sr	Sr	Ba	Ge	Ge	Hf	Hf	3.707	0.134	
Be	Sr	Sn	Ti	Ti	Ga	Ga	Ga	2.076	0.705	Ca	Sr	Cd	Cd	Si	Si	Si	Ti	2.731	0.852	Mg	Ba	Ba	Zn	Ti	Ti	Ti	Hf	Hf	3.190	0.939	Be	Ca	Zn	Ti	Ge	Ti	Ti	Zr	3.707	0.280
Ca	Ba	Ge	Al	Al	Al	Al	Ga	2.076	0.476	Be	Ca	Cd	Cd	Ge	Ge	Hf	Hf	2.731	0.831	Mg	Ca	Cd	Cd	Si	Ti	Ti	Ti	3.190	0.901	Ca	Ca	Ba	Ba	Ti	Ti	Ti	Zr	3.707	0.491	
Be	Ca	Ba	Zn	Sn	Sn	Sn	Sn	2.076	0.570	Ca	Ba	Sn	Zr	Y	Y	Y	Y	2.731	0.762	Ca	Sr	Ba	Ba	Sn	Sn	Zr	Zr	3.190	0.810	Ca	Ca	Ca	Ba	Si	Ge	Ti	Ti	3.707	0.313	
Be	Cd	Si	Si	Al	In	In	In	2.077	0.685	Sr	Ba	Ge	Hf	Sc	Sc	Sc	Sc	2.731	0.776	Mg	Sr	Cd	Cd	Ti	Zr	Zr	Zr	3.190	0.853	Be	Mg	Ti	Ti	Sc	Sc	Y	Y	3.707	0.413	
Mg	Mg	Sn	Sn	Al	Al	Ga	In	2.077	0.448	Mg	Mg	Si	Si	Ga	In	Y	Y	2.731	0.724	Be	Cd	Si	Si	Al	Al	Y	Y	3.190	0.663	Mg	Ca	Sr	Sr	Zr	Hf	Hf	Hf	3.707	0.512	
Ca	Sr	Sn	Sn	Sc	Sc	Y	Y	2.077	0.548	Ca	Ba	Zn	Zn	Si	Si	Hf	Hf	2.731	0.757	Sr	Zn	Zr	Zr	Ga	Sc	Sc	Sc	3.190	0.687	Be	Be	Ca	Ba	Ge	Zr	Zr	Zr	3.707	0.227	
Sr	Cd	Si	Si	In	In	Sc	Sc	2.077	0.680	Mg	Ba	Ba	Cd	Sn	Ti	Ti	Ti	2.731	0.758	Zn	Zn	Si	Ti	Ti	Ga	Ga	Sc	3.190	0.778	Mg	Ca	Zn	Zr	Sc	Y	Y	Y	3.707	0.529	
Ca	Ca	Cd	Cd	Ge	Sn	Sn	Ti	2.078	0.442	Be	Sr	Sr	Zn	Sn	Sn	Sn	Zr	2.731	0.697	Zn	Ca	Hf	Hf	Al	Al	Al	Y	3.190	0.626	Mg	Ca	Ti	Zn	Ge	Ge	Ge	Ti	3.708	0.878	
Mg	Sr	Zn	Ti	Ti	Ga	Ga	Ga	2.078	0.530	Be	Ba	Zr	Zr	Al	Ga	Ga	Ga	2.731	0.752	Zn	Zn	Cd	Cd	Si	Ge	Ti	Ti	3.190	0.650	Mg	Ca	Si	Si	Al	Sc	Sc	Sc	3.708	0.377	
Ba	Ba	Zn	Cd	Si	Si	Zr	Zr	2.078	0.576	Mg	Ca	Cd	Cd	Ge	Ge	Ge	Zr	2.731	0.743	Be	Sr	Si	Ti	Y	Y	Y	Y	3.190	0.836	Sr	Sr	Sr	Ba	Si	Si	Ge	Zr	3.708	0.655	
Zn	Zn	Sn	Zr	Ga	Ga	Y	Y	2.078	0.365	Ba	Ba	Hf	Hf	Ga	Sc	Y	Y	2.731	0.648	Zn	Zn	Ti	Ti	Al	In	Sc	Sc	3.190	0.673	Be	Mg	Mg	Ba	Ti	Hf	Hf	Hf	3.708	0.913	
Zn	Zn	Ge	Sn	Ga	Ga	Y	Y	2.079	0.509	Mg	Mg	Ge	Ge	Al	Al	Ga	In	2.731	0.594	Sr	Ba	Ba	Ba	Si	Ge	Sn	Sn	3.191	0.838	Be	Be	Si	Hf	In	Sc	Sc	Sc	3.708	0.131	
Sr	Cd	Hf	Hf	In	In	Y	Y	2.079	0.568	Be	Be	Be	Cd	Si	Sn	Zr	Zr	2.731	0.943	Mg	Ba	Zr	Hf	Al	Al	Al	Al	3.191	0.895	Sr	Ba	Ba	Ba	Si	Ge	Ge	Hf	3.709	0.174	
Mg	Cd	Sn	Sn	In	Sc	Sc	Sc	2.080	0.352	Ba	Ba	Zr	Zr	Ga	Sc	Sc	Y	2.731	0.997	Mg	Ba	Ti	Ti	Hf	Al	Al	Al	3.191	0.617	Be	Mg	Sr	Sr	Ge	Ge	Ge	Hf	3.709	0.133	
Ca	Zn	Si	Si	Ga	Ga	In	In	2.080	0.668	Ba	Ti	Zr	Zr	Ga	Sc	Sc	Sc	2.731	0.925	Ca	Cd	Hf	Hf	Ga	Sc	Sc	Sc	3.191	0.798	Ca	Sr	Sr	Sr	Si	Si	Ti	Hf	3.709	1.046	
Ca	Zn	Sn	Hf	Ga	Ga	Ga	Ga	2.080	0.677	Ca	Ca	Si	Ti	Ti	Ga	Ga	Sc	2.731	0.848	Mg	Mg	Zn	Zn	Si	Si	Sn	Hf	3.191	0.973	Mg	Sr	Ba	Zn	Si	Si	Si	Si	3.709	0.883	
Cd	Cd	Si	Si	Al	Ga	Ga	In	2.080	0.321	Ba	Ge	Cd	Zr	Al	Sc	Sc	Sc	2.732	0.871	Zn	Cd	Si	Si	In	Sc	Sc	Sc	3.191	0.590	Mg	Mg	Zr	Zr	Al	Ga	Ga	Sc	3.709	0.606	
Ca	Ca	Zn	Cd	Sn	Sn	Sn	Ti	2.081	0.630	Ca	Sr	Cd	Cd	Si	Hf	Hf	Hf	2.732	0.931	Ca	Zn	Zn	Sn	Sn	Ti	Ti	Zr	3.191	0.663	Be	Ca	Zn	Zn	Ge	Ti	Ti	Ti	3.709	1.308	

Sr	Zn	Zr	Hf	In	In	In	In	2.099	0.453	Ba	Ba	Zn	Zn	Si	Ti	Zr	Zr	2.740	0.761	Zn	Zn	Cd	Cd	Si	Si	Zr	Hf	3.199	0.788	Be	Be	Mg	Sr	Si	Ti	Ti	Ti	3.720	0.836	
Mg	Ba	Ti	Ti	Al	In	In	In	2.099	0.811	Mg	Mg	Ge	Sn	Al	Al	Al	In	2.740	0.847	Be	Be	Sr	Ba	Zr	Sr	Hf	Hf	3.199	0.988	Be	Ca	Si	Si	Al	Al	Al	Sc	3.720	0.393	
Zn	Zn	Ge	Hf	Al	In	In	In	2.100	0.814	Ca	Sr	Ti	Ti	Ti	Ti	Ti	In	2.740	0.821	Be	Be	Be	Sr	Si	Ti	Zr	Zr	3.199	1.046	Sr	Ba	Ba	Si	Ge	Ge	Zr	3.720	0.464		
Mg	Mg	Sn	Sn	Al	Al	In	Sc	2.100	0.487	Sr	Zn	Zn	Zn	Sn	Ti	Hf	Hf	2.741	0.917	Zn	Zn	Zr	Hf	Al	Al	Al	In	3.200	0.698	Be	Sr	Sr	Ba	Ti	Hf	Hf	Hf	3.720	0.407	
Sr	Cd	Si	Hf	Ca	Ga	Ga	Ga	2.100	0.646	Mg	Ba	Ba	Cd	Ti	Ti	Zr	Zr	2.741	0.971	Mg	Mg	Zr	Zr	Al	In	In	Sc	3.200	0.933	Be	Sr	Sr	Sr	Ge	Ti	Hf	Hf	3.721	0.766	
Mg	Zn	Ge	Ge	Ga	Ga	Y	Y	2.100	0.766	Be	Be	Ge	Zr	In	In	In	2.741	0.617	Be	Be	Zn	Cd	Zr	Zr	Zr	Hf	3.200	1.110	Be	Sr	Sr	Sr	Ge	Ti	Zr	Zr	3.721	0.735		
Sr	Sr	Sn	Zr	Al	Al	Al	Sc	2.100	0.430	Sr	Sr	Ti	Zr	Al	Al	Ga	Ga	2.741	0.725	Mg	Mg	Mg	Sr	Ge	Sn	Sr	Zr	3.200	0.667	Be	Sr	Zn	Zn	Sn	Ti	Ti	Hf	3.721	0.588	
Mg	Sr	Ge	Ge	Ga	Y	Y	Y	2.100	0.615	Ba	Ba	Ba	Zn	Si	Ge	Hf	Hf	2.741	0.956	Be	Be	Cd	Cd	Si	Si	Zr	Hf	3.200	0.762	Be	Mg	Mg	Ba	Si	Hf	Hf	Hf	3.721	0.913	
Sr	Cd	Si	Si	Ga	Ga	Y	Y	2.100	0.757	Be	Be	Be	Cd	Sn	Zr	Hf	Hf	2.741	0.583	Mg	Ca	Cd	Cd	Si	Si	Si	Ge	3.200	0.909	Be	Ca	Zn	Zn	Zr	Zr	Hf	Hf	3.721	0.881	
Sr	Ba	Ti	Hf	In	In	In	In	2.101	0.420	Zn	Cd	Ge	Ge	Sc	Y	Y	Y	2.741	0.689	Be	Be	Ca	Zn	Ge	Zr	Zr	Zr	3.200	1.114	Be	Mg	Hf	Hf	Ga	Ga	Sc	3.722	0.580		
Sr	Sr	Ti	Zr	In	In	In	Y	2.101	0.534	Ca	Cd	Cd	Cd	Sn	Zr	Hf	Hf	2.741	0.952	Mg	Zn	Zn	Cd	Sn	Hf	Hf	Hf	3.200	1.067	Be	Zn	Zn	Zn	Ge	Ti	Hf	3.722	0.535		
Ba	Ba	Sn	Ti	Al	Al	Al	In	2.101	0.616	Be	Mg	Sr	Sr	Si	Sn	Sn	2.741	0.828	Mg	Mg	Si	Zr	In	Y	Y	Y	3.201	1.099	Be	Zn	Zn	Zn	Si	Zr	Hf	Hf	3.722	0.583		
Ba	Ba	Si	Sn	Ga	Y	Y	Y	2.102	0.381	Ba	Ba	Zr	Zr	Al	Ga	Sc	Sc	2.742	1.094	Zn	Zn	Zn	Zr	Al	Sc	Sc	Y	3.201	1.162	Mg	Ca	Zn	Zn	Ti	Ti	Ti	Zr	3.722	0.449	
Be	Ba	Ge	Sn	Y	Y	Y	Y	2.102	0.504	Ba	Ba	Si	Si	Al	Ga	Sc	Sc	2.742	1.046	Be	Ba	Zn	Zn	Ge	Ge	Ge	Hf	3.201	1.046	Mg	Ca	Ca	Ba	Ge	Ge	Zr	3.722	0.642		
Ca	Zn	Zn	Cd	Si	Si	Sn	Sn	2.102	0.603	Cd	Cd	Ti	Ti	Sc	Sc	Y	Y	2.742	0.609	Ca	Ca	Ti	Hf	Ga	Sc	Sc	Sc	3.201	1.123	Al	Ga	In	Sc	Sc	Sc	Y	Y	3.722	0.697	
Ba	Cd	Cd	Cd	Si	Si	Ti	Zr	2.102	0.364	Be	Be	Sn	Sn	Al	Al	In	Sc	2.742	0.898	Be	Ca	Si	Si	Al	Y	Y	Y	3.201	0.876	Be	Ba	Ge	Ca	Ge	Zr	Zr	3.723	0.457		
Cd	Cd	Ti	Hf	Al	Al	In	In	2.103	0.631	Be	Ba	Ba	Cd	Ti	Zr	Zr	Zr	2.742	1.025	Ca	Sr	Zn	Zn	Si	Hf	Hf	Hf	3.201	0.938	Be	Be	Mg	Ca	Si	Hf	Hf	Hf	3.723	0.908	
Be	Be	Sn	Sn	Al	In	In	Y	2.103	0.646	Sr	Sr	Sn	Zr	Sc	Y	Y	Y	2.742	0.574	Cd	Cd	Zr	Hf	Al	Al	Al	Sc	3.201	1.065	Ca	Ca	Sr	Zn	Si	Si	Si	Ti	3.723	0.889	
Be	Be	Ba	Cd	Sn	Ga	Sn	Zr	2.103	0.300	Be	Mg	Hf	Hf	In	Y	Y	Y	2.742	0.860	Be	Be	Sr	Sr	Si	Si	Ge	Hf	3.201	0.765	Ca	Ca	Ba	Si	Si	Ti	Zr	3.723	0.727		
Ba	Cd	Hf	Hf	Ca	Ga	In	In	2.104	0.870	Sr	Sr	Sn	Cd	Ti	Zr	Zr	Zr	2.742	1.020	Zn	Cd	Cd	Cd	Si	Zr	Zr	Hf	3.201	0.875	Be	Be	Mg	Sr	Si	Si	Ge	Ge	3.723	0.534	
Cd	Cd	Sn	Hf	Al	Al	Al	In	2.104	0.870	Be	Sr	Zn	Zn	Ge	Ge	Ge	Sn	2.742	0.688	Be	Ca	Ca	Cd	Ti	Hf	Hf	Hf	3.201	1.107	Be	Mg	Mg	Ba	Ti	Ti	Zr	Zr	3.723	0.544	
Be	Ba	Cd	Cd	Sn	Sn	Hf	Hf	2.104	0.656	Mg	Mg	Mg	Mg	Cd	Ge	Sn	Sr	2.742	0.712	Mg	Mg	Ge	Cd	Al	Sc	Sc	Sc	3.201	1.070	Be	Ge	Hf	Al	Sc	Sc	Sc	3.723	0.542		
Ba	Ba	Ge	Ge	Al	Al	Sc	Y	2.104	0.698	Ba	Zn	Zn	Ge	Ti	Zr	Zr	Zr	2.743	0.830	Be	Cd	Si	Si	Ga	Ga	Sc	Sc	3.201	0.990	Be	Be	Sn	Ti	Sc	Sc	Sc	Y	3.723	0.659	
Ca	Ca	Cd	Cd	Sn	Sn	Ti	Zr	2.104	0.823	Ca	Ca	Zn	Cd	Ge	Zr	Zr	Zr	2.743	0.658	Mg	Ca	Hf	Hf	Sc	Y	Y	Y	3.201	1.027	Be	Be	Mg	Sr	Si	Si	Sn	3.723	0.642		
Sr	Sr	Si	Ge	Ga	Ga	Y	Y	2.104	0.598	Mg	Cd	Si	Hf	Ga	Ga	Ga	Ga	2.743	0.682	Sr	Sr	Ba	Zn	Ti	Y	Ti	Zr	3.201	0.810	Be	Be	Mg	Cd	Si	Si	Si	Zr	3.724	0.523	
Be	Sr	Ti	Ti	In	In	In	Y	2.104	0.665	Zn	Cd	Zr	Hf	Ga	Ga	Ga	Ga	2.743	0.823	Mg	Ca	Ge	Zr	Y	Y	Y	Y	3.201	0.876	Be	Mg	Sr	Sr	Sn	Ti	Ti	Zr	3.724	0.545	
Cd	Cd	Si	Zr	Ga	In	Y	Y	2.104	0.814	Be	Sr	Ba	Ba	Si	Sn	Sn	2.743	0.718	Ca	Ba	Ba	Zn	Si	Si	Zr	Zr	3.202	0.952	Mg	Mg	Ba	Ba	Ge	Ge	Ti	Zr	3.724	0.646		
Be	Ba	Zr	Zr	Ga	In	In	In	2.105	0.587	Sr	Sr	Hf	Hf	Al	Ga	Sc	Sc	2.743	0.720	Ca	Zn	Zn	Zn	Si	Ti	Zr	Zr	3.202	0.737	Be	Be	Ca	Ca	Ge	Zr	Hf	Hf	3.724	0.794	
Sr	Cd	Ti	Ti	Ti	Ga	In	In	2.105	0.572	Ca	Ca	Ca	Cd	Ge	Ge	Sn	Zr	2.743	0.738	Be	Ca	Ca	Cd	Si	Ti	Ti	Ti	3.202	0.825	Mg	Ca	Sr	Sr	Ti	Hf	Hf	Hf	3.724	0.645	
Sr	Ba	Ge	In	Ge	Sc	Sc	Sc	2.105	0.663	Zn	Zn	Zn	Hf	Sc	Sc	Y	Y	2.743	0.917	Mg	Sr	Zr	Zr	Zr	Al	Al	Sc	3.202	0.998	Be	Mg	Mg	Sr	Ge	Hf	Hf	Hf	3.724	0.740	
Mg	Ba	Ge	Hf	Ga	Ga	Ga	Ga	2.105	0.552	Sr	Cd	Hf	Hf	Ga	Y	Y	Y	2.743	0.796	Be	Ca	Cd	Cd	Ge	Ti	Ti	Ti	3.202	0.807	Be	Be	Mg	Ba	Si	Si	Zr	Zr	3.724	0.789	
Ca	Cd	Ti	Ti	Ga	In	In	Y	2.105	0.541	Sr	Sr	Zr	Zr	In	Sc	Y	Y	2.744	0.831	Sr	Cd	Si	Si	Al	Sc	Sc	Sc	3.204	1.003	Be	Be	Be	Zn	Si	Ge	Ti	Ti	3.725	0.554	
Ca	Sr	Zn	Zn	Ge	Ge	Sn	Sn	2.105	0.650	Sr	Zn	Hf	Hf	Ga	Ga	Ga	Sc	2.744	1.049	Be	Ca	Cd	Cd	Ti	Ti	Hf	Hf	3.202	1.052	Mg	Sr	Ba	Ba	Ge	Ge	Zr	Zr	3.725	0.625	
Ca	Zn	Ge	Ge	Ga	Al	Sc	Sc	2.105	0.534	Be	Be	Be	Ba	Ge	Ge	Sn	Zr	2.744	0.726	Be	Mg	Sr	Sr	Sn	Sn	Ti	Ti	3.202	0.716	Mg	Mg	Ca	Sr	Ti	Zr	Zr	Zr	3.725	0.564	
Ba	Zn	Ge	Sn	Al	Al	Al	Sc	2.105	0.666	Zn	Zn	Ti	Ti	Ga	In	Sc	2.744	0.758	Ca	Ba	Ba	Zn	Si	Si	Si	Ti	3.202	0.948	Mg	Mg	Ca	Sr	Ti	Hf	Hf	Hf	3.725	0.780		
Sr	Zn	Zn	Zn	Si	Sn	Sn	Zr	2.106	0.683	Cd	Zn	Zn	Cd	Si	Si	Hf	Hf	2.744	0.942	Mg	Mg	Cd	Cd	Si	Ti	Zr	Zr	3.202	1.117	Be	Be	Mg	Ca	Ti	Zr	Zr	Zr	3.725	0.755	
Cd	Cd	Sn	Ti	Al	Al	Ga	Ga	2.106	0.464	Sr	Ba	Si	Si	In	Y	Y	Y	2.744	0.778	Zn	Cd	Zn	Cd	Al	Al	Al	Ga	3.202	0.693	Be	Ca	Ca	Sr	Si	Si	Sn	3.725	0.615		
Mg	Sr	Ti	Zr	In	In	In	In	2.106	0.601	Be	Be	Mg	Zn	Sn	Sn	Sn	Zr	2.744	0.837	Be	Cd	Hf	Hf	Al	Al	Sc	Sc	3.202	0.789	Be	Ca	Ba	Ba	Ge	Ge	Zr	Zr	3.725	0.919	
Cd	Cd	Zr	Hf	Al	Al	In	In	2.106	0.687	Sr	Sr	Ba	Ba	Zn	Sn	Sr	Zr	2.744	0.883	Zn	Zn	Ti	Zr	Hf	Sc	Sc	Y	Y	3.202	0.936	Mg	Mg	Mg	Sr	Ti	Zr	Zr	Zr	3.725	0.897
Be	Be	Ba	Cd	Ge	Ge	Sn	Sn	2.107	0.834	Ba	Ba	Ba	Zn	Si	Si	Ge	Sn	2.744	0.615	Be	Be	Zn	Cd	Zr	Hf	Hf	Hf	3.203	0.878	Be	Be	Ge	Zr	Al	Al	Ga	Ga	3.725	0.603	
Be	Zn	Ge	Ti	In	In	In	In	2.107	0.571	Be	Cd	Hf	Hf	Ga	Ga	Ga	In	2.744	0.796	Be	Be	Ba	Ba	Ti	Zr	Hf	Hf	3.203	0.874	Be	Ca	Ba	Ba	Si	Ti	Ti	Ti	3.726	0.572	
Ba	Ba	Si	Ti	Ga	In	In	In	2.107	0.674	Cd	Cd	Ti	Zr	Ga	Y	Y	Y	2.744	0.873	Zn	Zn	Si	Ge	Al	Al	Y	Y	3.203	0.892	Mg	Sr	Sr	Sr	Si	Ti	Zr	Zr	3.726	0.618	
Ba	Ba	Ba	Zn	Zn	Si	Ge	Ge	2.107	0.818	Ba	Ba	Zr	Zr	Al	Al	Sc	Y	2.744	0.585	Ba	Ba	Zn	Ti	Ti	Sc	Sc	Y	Y	3.203	0.946	Ca	Ca	Sr	Sr	Si	Ge	Ge	Zr	3.726	0.481
Mg	Mg	Sn	Sn	Al	Al	Ga	Y	2.107	0.685	Ca	Ca	Si	Ge	Al	Al	Sc	2.744	0.788	Be	Mg	Cd	Cd	Ge	Hf	Hf	Hf	3.203	0.856	Mg	Ca	Ca	Ba	Sn	Ti	Ti	Ti	3.726	0.674		
Be	Be	Ca	Cd	Si	Sn	Sn	Sn	2.108	0.701	Be	Be	Sn	Zr	Ga	Ga	In	In	2.744	1.100	Sr	Zn	Si	Hf	Sc	Sc	Sc	Sc	3.203	0.878	Be	Be	Ca	Ca	Si	Zr	Hf	Hf	3.726	0.729	
Ba	Ba	Si	Ti	In	In	In	In	2.108	0.745	Zn	Zn																													

Sr	Sr	Si	Si	Al	Al	Ga	In	In	2.124	0.777	Ca	Ca	Ti	Ti	Al	Ga	Ga	Y	2.753	0.993	Be	Sr	Cd	Cd	Ti	Ti	Ti	HF	3.210	0.720	Mg	Cd	Ti	Zr	Sc	Sc	Sc	Sc	3.739	1.661		
Ca	Ca	Si	Si	Al	Al	Al	Al	Y	2.124	0.935	Be	Cd	Si	Si	In	In	Sc	Sc		0.676		Be	Be	Cd	Cd	Gd	Ti	Ti	HF	3.210	0.793	Mg	Mg	Mg	Ba	Si	Ge	Ge	Ti	3.739	1.464	
Ba	Ba	Si	Si	Al	Al	Al	Al	Y	2.126	0.765	Sr	Sr	Ba	Ba	Cd	Ti	HF	HF		2.753	0.665	Ca	Ca	Cd	Cd	Ti	Ti	Ti	Zr	3.210	1.038	Mg	Mg	Si	Ge	Al	Sc	Sc	Sc	3.739	1.396	
Be	Sr	Ti	Ti	In	In	Y	Y		2.126	0.730	Ca	Ca	Ba	Cd	Si	Si	Si	Sn		2.754	0.961	Be	Mg	Mg	Sr	Sn	Sn	Sn	HF	3.211	0.980	Be	Be	Ge	Ge	Al	Al	Ga	Sc	3.740	0.939	
Ba	Ba	Sn	Zr	In	Al	Al	Al	Ga	2.126	0.797	Be	Mg	Sr	Sr	Ge	Sn	Sn	Sn		2.754	0.642	Mg	Ca	Zr	Zr	Ga	Ga	Ga	Sc	3.211	0.894	Be	Be	Ge	Ge	Al	Si	Ti	HF	3.740	0.991	
Ba	Ba	Sn	Cd	Ge	Sc	Sc	Sc	Sc	2.126	0.737	Ca	Ca	Ca	Cd	Si	Ge	Zr	Zr		2.754	0.628	Mg	Sr	Sr	Zn	Si	Si	Ge	Ge	3.211	1.112	Be	Zn	Zn	Zn	Si	Ti	HF	HF	3.740	1.218	
Ba	Ba	Zn	Cd	Ge	Ge	HF	HF		2.127	0.704	Ca	Cd	Cd	Cd	Sn	Ti	Ti	HF		2.754	0.954	Mg	Sr	Si	HF	Al	Al	Al	Al	3.211	0.940	Mg	Mg	Ca	Ba	Sn	Ti	Ti	Ti	3.740	0.806	
Ba	Ba	Zn	Zn	Si	Sn	HF	HF		2.127	0.787	Sr	Sr	Cd	Cd	Ti	Ti	Ti	Zr		2.754	0.943	Ca	Cd	Si	Zr	Al	Al	Al	Al	3.211	0.912	Be	Ca	Ca	Sr	Sn	Zr	Zr	Zr	3.740	0.883	
Mg	Sr	Ti	Ti	In	In	Y	Y		2.127	0.724	Mg	Ca	HF	HF	Ga	Ga	Y	Y		2.754	0.812	Mg	Mg	Ca	Sr	Si	Si	Sn	Sn	3.211	0.525	Be	Ca	Ca	Sr	Sn	HF	HF	HF	3.740	1.238	
Be	Ba	Zn	Zn	Si	Sn	Sn	Sn		2.128	0.748	Be	Mg	Sn	Sn	Al	Al	Al	Y		2.754	0.895	Ca	Ca	Zn	Ge	Ge	Zr	HF	3.211	0.484	Mg	Mg	Mg	Sr	Ge	Ti	Ti	HF	3.740	1.693		
Sr	Cd	Zr	Zr	In	In	Y	Y		2.128	0.761	Be	Sr	Sr	Cd	Sn	HF	HF	HF		2.754	0.878	Sr	Cd	Ti	Zr	Y	Y	Y	Y	3.212	0.716	Mg	Mg	Si	Zr	Sc	Sc	Y	Y	3.740	1.588	
Ba	Zn	HF	HF	Ga	In	In	Y		2.128	0.676	Sr	Sr	Zr	HF	Ga	Ga	Sc		2.754	0.971	Be	Ca	HF	HF	Ga	Ga	Sc	3.212	0.456	Be	Be	Mg	Ba	Si	Si	Si	HF	3.740	1.617			
Ca	Sr	Sn	Sn	Sc	Y	Y	Y		2.128	1.028	Ba	Ba	Ge	HF	Al	Y	Y	Y		2.754	1.015	Be	Zn	Zn	Cd	Ge	Ge	Ge	HF	3.212	0.377	Be	Ca	Ca	Zn	Zr	HF	HF	HF	3.741	1.015	
Cd	Cd	Si	HF	Ga	Ga	Ga	Ga		2.129	1.039	Ca	Zn	HF	HF	In	In	Sc	Sc		2.754	0.659	Ca	Sr	Sr	Zn	Si	Si	Ge	Ge	3.212	0.729	Be	Mg	Mg	Ba	Ge	Ge	HF	HF	3.741	1.127	
Be	Ba	Cd	Cd	Sn	Sn	Zr	Zr		2.129	0.937	Sr	Sr	Ti	Ti	Al	Ga	Y	Y		2.754	0.963	Mg	Mg	Ge	HF	Al	Y	Y	Y	3.212	1.129	Be	Be	Ca	Ca	Sn	Zr	HF	HF	3.741	1.419	
Be	Ba	Ge	Zr	Ga	Ga	Ga	Ga		2.129	0.897	Be	Be	Ba	Cd	Ti	Ti	Zr	Zr		2.754	0.787	Zn	Cd	Ti	Ti	Sc	Y	Y	Y	3.212	1.004	Be	Sr	Sr	Sr	Ge	Ge	Zr	HF	3.741	0.918	
Ca	Cd	Sn	Sn	Al	Sc	Sc	Sc		2.129	1.044	Ca	Zn	Ba	Cd	Ti	Zr	Zr	Zr		2.754	0.623	Be	Mg	Zr	Zr	Al	In	In	In	3.212	1.052	Mg	Ca	Ba	Ba	Si	Si	HF	HF	3.741	1.030	
Mg	Zn	Zn	Cd	Si	Sn	Sn	Sn		2.129	0.934	Zn	Zn	Zr	Zr	Al	In	In	Sc		2.755	0.723	Ca	Sr	Si	Si	Al	Y	Y	Y	3.213	0.585	Mg	Mg	Mg	Zn	Zn	Ti	Zr	HF	3.741	1.434	
Mg	Sr	Ge	Ge	Al	Al	Al	Y		2.130	0.866	Mg	Ba	Zr	Zr	In	Sc	Sc	Sc		2.755	0.980	Mg	Mg	Zr	HF	In	In	Sc	Sc	3.213	0.563	Mg	Ba	Ba	Ba	Ba	Si	Ti	HF	3.741	1.051	
Be	Mg	Ge	Ge	Al	Al	In	In		2.130	1.041	Ca	Ca	Si	Ge	Al	Al	Y	Y		2.755	0.916	Mg	Zn	Cd	Cd	Si	Ti	Ti	HF	3.213	0.840	Be	Ca	Ca	Zn	Si	Si	Si	Ge	3.741	1.325	
Be	Ca	Si	Zr	In	In	In	In		2.130	0.930	Sr	Sr	Zr	Zr	In	Y	Y	Y		2.755	1.179	Be	Mg	Ca	Cd	Ge	Ge	Ge	Ge	3.213	0.552	Be	Sr	Sr	Sr	Ti	Zr	HF	HF	3.742	1.585	
Mg	Sr	Cd	Cd	Sn	Sn	Sn	Ti		2.131	0.804	Sr	Sr	Sr	Zn	Ge	Sn	HF	HF		2.755	1.122	Be	Be	Ti	Zr	Al	Al	Y	Y	3.213	0.472	Mg	Mg	Ca	Sr	Ge	Zr	Zr	Zr	3.742	0.934	
Be	Ba	Ba	Cd	Sn	Sn	HF	HF		2.131	0.881	Be	Cd	Ti	Ti	Ga	Y	Y	Y		2.755	0.682	Ca	Ca	Sr	Zn	Si	Si	HF	HF	3.213	0.853	Ca	Sr	Ba	Ba	Ge	Ge	Ge	Zr	3.742	1.226	
Sr	Zn	Ge	Ti	Ga	Ga	Ga	Ga		2.131	0.884	Be	Be	Ge	Sn	Ga	Ga	Y	Y		2.755	0.967	Be	Mg	Mg	Ba	Si	Si	Sn	Sn	3.213	0.617	Mg	Cd	Si	Zr	Sc	Sc	Sc	Sc	3.742	1.620	
Ba	Ba	Zr	HF	In	In	In	Y		2.131	0.775	Be	Sn	Zr	Zr	In	Y	Y	Y		2.755	1.089	Mg	Mg	Si	HF	Al	Al	Sc	Y	3.213	0.771	Be	Sr	Zn	Zn	Ti	Ti	HF	HF	3.742	0.667	
Ca	Zn	Si	Ge	Ga	Ga	Ga	Ga		2.131	0.871	Sr	Cd	HF	HF	Al	Al	Al	In		2.755	0.644	Ca	Ca	Si	HF	Sc	Sc	Sc	Y	3.213	0.998	Be	Zn	Zn	Si	Al	Al	Al	In	3.743	0.744	
Mg	Mg	Ge	HF	In	In	In	Y		2.131	0.870	Sr	Cd	Ti	Ti	Al	Ga	Ga	Ga		2.755	0.927	Mg	Mg	Ca	Cd	Si	HF	HF	HF	3.213	0.568	Mg	Ca	Ca	Zn	Ti	Zr	Zr	Zr	3.743	0.918	
Zn	Zn	Ge	Ge	Al	Al	Ga	In		2.131	0.812	Cd	Cd	Sn	Zr	Al	Sc	Sc	Sc		2.755	1.082	Zn	Zn	Si	Si	Al	Al	Ga	Y	3.213	0.680	Mg	Mg	Ca	Ba	Sn	Ti	Ti	Ti	3.743	0.873	
Sr	Zn	Ti	Ti	Ga	In	In	In		2.131	0.828	Ca	Ca	Ba	Cd	Si	Si	Zr	Zr		2.755	0.732	Be	Ti	HF	Ga	Ga	In	In	In	3.213	1.030	Be	Mg	Ge	Ge	Al	Al	Sc	Sc	3.743	0.838	
Ca	Ca	Si	HF	In	In	In	Sc		2.131	0.806	Ca	Zn	Cd	Cd	Ti	Ti	Ti	Zr		2.755	0.756	Mg	Zn	Cd	Cd	Ti	Ti	HF	HF	3.214	0.345	Be	Ba	Ba	Zn	Zn	Si	Si	Si	HF	3.743	0.789
Ca	Ca	Ge	Zr	Ga	Al	In	In		2.131	0.900	Sr	Zn	Zr	HF	Ga	Ga	Ga	Ga		2.756	0.874	Mg	Zn	Zr	Zr	Zn	Si	Y	Y	3.214	0.354	Mg	Mg	Mg	Zn	Zn	Si	Si	Ti	HF	3.743	0.968
Sr	Zn	Zr	Zr	In	In	In	Y		2.131	0.975	Mg	Mg	Ge	Sn	Al	Al	Al	Y		2.756	0.700	Be	Ba	Si	Si	Sc	Sc	Y	Y	3.214	0.516	Be	Ca	Sr	Ba	HF	HF	HF	HF	3.743	0.835	
Ca	Si	Ge	Al	Al	In	In	In		2.131	1.096	Ca	Zn	Zr	Zr	Ga	Ga	Ga	Sc		2.756	0.723	Mg	Mg	Si	Sn	Al	Al	Sc	Sc	3.214	1.154	Be	Be	Mg	Ca	Ti	Ti	HF	HF	3.743	0.785	
Ba	Ba	Zn	Zn	Ge	Sn	HF	HF		2.132	0.872	Ca	Cd	Cd	Si	Si	Ge	Ti		2.756	0.864	Sr	Sr	Si	Ti	Sc	Sc	Sc	Y	3.214	1.111	Be	Be	Ca	Sr	Ge	Ge	HF	HF	3.743	0.608		
Sr	Ba	HF	HF	In	In	In	Y		2.132	0.965	Sr	Sr	Si	Ge	Sc	Sc	Sc	Y		2.756	0.767	Ba	Ba	Ba	Zn	Si	Si	Ge	Ti	3.214	1.049	Be	Mg	HF	HF	Al	Al	Al	In	3.744	0.570	
Cd	Cd	Ge	Zr	In	In	Sc	Sc		2.132	1.083	Ba	Cd	Ti	Ti	Al	Al	In	In		2.756	0.769	Be	Sr	Zr	Zr	Al	Al	Al	Sc	3.214	1.220	Sr	Ba	Ba	Ba	Si	Si	Ge	Zr	3.744	0.666	
Zn	Zn	Ge	Ti	In	In	Y	Y		2.132	0.898	Sr	Zn	Zn	Zn	Si	Sn	Ti	Ti		2.756	0.788	Be	Be	Si	Ti	In	Y	Y	Y	3.215	1.068	Be	Be	Ca	Ca	Sn	Sn	Ti	HF	3.744	0.584	
Ba	Zn	HF	HF	Al	In	In	In		2.132	0.913	Zn	Zn	Sn	HF	Al	Al	Al	Y		2.756	0.833	Ca	Cd	Ti	Ti	HF	Al	Al	Y	3.215	1.065	Ca	Ca	Ca	Ba	Si	Ge	Ge	Zr	3.744	0.522	
Be	Ba	HF	HF	In	In	In	Y		2.132	1.008	Ca	Zn	Cd	Cd	Sn	HF	HF	HF		2.757	0.724	Be	Be	Ca	Zn	Ti	HF	HF	HF	3.215	0.712	Be	Zn	Zn	Zn	Ti	Zr	HF	HF	3.744	0.674	
Sr	Sr	Sn	HF	Al	Al	Al	Ga		2.132	0.799	Ca	Zn	Zn	Cd	Si	Ge	Ge	Ge		2.757	0.766	Ba	Cd	Ti	Zr	Sc	Sc	Sc	Sc	3.215	0.670	Mg	Sr	Sr	Ba	Si	Ti	Ti	Zr	3.744	0.934	
Be	Ba	Cd	Cd	Sn	Sn	Al	Sn		2.133	0.808	Ca	Ca	Sn	Zr	Al	Y	Y	Y		2.757	0.944	Ca	Sr	Si	Zr	Sc	Sc	Sc	Y	3.215	0.890	Mg	Mg	Zn	Zn	Zn	Si	Zr	Zr	3.744	0.821	
Mg	Cd	Ti	HF	In	In	In	In		2.133	0.777	Ca	Cd	Zr	HF	Ga	Ga	Ga	Ga		2.757	0.640	Be	Sr	Cd	Cd	Ti	Ti	Ti	Zr	3.215	0.631	Be	Zn	Zn	Zn	Sn	Ti	Ti	Zr	3.744	0.810	
Mg	Ca	Cd	Cd	Sn	Sn	HF	HF		2.133	0.470	Ca	Sr	Sr	Cd	Ge	Ge	Ti	Ti		2.757	0.679	Be	Be	Ca	Cd	Si	Si	Si	Sn	3.215	0.557	Mg	Mg	Mg	Ca	Ga	Ge	Sn	HF	3.744	0.614	
Be	Ba	Si	Si	In	In	Sc	Sc		2.133	0.412	Mg	Mg	Sr	Cd	Ge	Ge	Sn		2.757	0.885	Be	Be	HF	HF	Al	In	Y	Y	3.215	0.902	Be	Zn	Zr	Zr	Al							

Ca	Ca	Ge	Hf	Ga	Ga	In	2.151	0.609	Ca	Sr	Sr	Cd	Sn	Zr	Zr	2.765	1.008	Mg	Ca	Hf	Hf	Al	Al	In	3.225	0.910	Be	Zn	Si	Ge	Sc	Sc	Sc	3.761	0.184				
Sr	Sr	Si	Si	Al	Ga	In	2.151	0.301	Be	Zn	Zn	Zn	Sn	Ti	Ti	2.766	0.923	Be	Ba	Ba	Zn	Ti	Ti	Ti	Hf	3.225	0.763	Mg	Sr	Ba	Ba	Si	Si	Ti	3.761	0.542			
Sr	Sr	Si	Si	Hf	Ga	Ga	Y	2.151	0.740	Be	Mg	Cd	Cd	Ge	Ge	Sn	2.766	1.030	Be	Mg	Ba	Zn	Ge	Ge	Ge	3.225	0.735	Mg	Sr	Sr	Ti	Ti	Zr	Zr	3.761	0.998			
Sr	Sr	Cd	Cd	Sn	Sn	Sn	2.151	0.745	Ca	Zn	Zn	Cd	Sn	Zr	Zr	2.766	0.987	Mg	Mg	Zr	Hf	Al	Al	Y	Y	3.225	0.856	Be	Zn	Cd	Cd	Si	Si	Si	Hf	3.761	0.863		
Mg	Ca	Cd	Cd	Sn	Sn	Sn	2.152	0.301	Ca	Ca	Ti	Hf	Al	Al	In	2.766	0.776	Be	Be	Sn	Zr	Ga	Ga	Sc	Sc	3.225	0.712	Be	Mg	Zn	Ti	Ti	Zr	Zr	3.761	0.902			
Sr	Sr	Ge	Ge	In	Sc	Y	2.152	0.657	Be	Ba	Cd	Cd	Ge	Ge	Ge	Ti	2.766	0.978	Mg	Mg	Ca	Zn	Sn	Sn	Sn	Hf	3.225	0.679	Ca	Zn	Si	Ti	Sc	Sc	Sc	3.762	0.376		
Ca	Ca	Sn	Sn	Al	Ga	Ga	Y	2.152	0.662	Ca	Ca	Sr	Cd	Si	Si	Hf	Hf	2.766	0.939	Be	Be	Cn	Zn	Si	Si	Ge	Sn	3.226	0.896	Mg	Mg	Mg	Sr	Ge	Ti	Hf	3.762	0.372	
Be	Ba	Ge	In	Sn	Sc	Sc	2.152	0.445	Sr	Zn	Si	Sn	Sc	Sc	Sc	Sc	2.766	0.950	Mg	Zn	Zn	Zn	Ge	Sn	Zr	Zr	3.226	0.806	Mg	Sr	Sr	Sr	Zr	Hf	Hf	3.762	0.695		
Ca	Sr	Ti	Hf	In	In	In	2.153	0.608	Be	Sr	Ge	Zr	Y	Y	Y	2.766	1.101	Be	Mg	Mg	Sr	Sn	Sn	Sn	Zr	3.226	0.705	Mg	Ca	Ca	Ba	Zr	Zr	Hf	3.762	0.375			
Ba	Zn	Cd	Cd	Sn	Sn	Ti	2.153	0.675	Ca	Ca	Ca	Cd	Ge	Ge	Zr	Hf	2.767	0.726	Be	Ca	Zn	Zn	Ge	Ge	Zr	Zr	3.226	0.751	Be	Ca	Sr	Sr	Ti	Ti	Hf	3.762	0.301		
Be	Sr	Cd	Ge	Ge	Ge	Sn	2.153	0.450	Ca	Ba	Zn	Zn	Si	Si	Zr	Zr	2.767	0.763	Be	Zn	Zn	Cd	Sn	Hf	Hf	Hf	3.226	0.695	Be	Mg	Ca	Sr	Hf	Hf	Hf	3.762	0.722		
Ba	Ba	Sn	Ti	Ga	Ca	Sc	2.153	0.594	Ca	Ca	Si	Ge	Al	Al	Al	Ga	2.767	1.082	Ca	Ca	Si	Ti	In	Sc	Sc	Sc	3.226	0.630	Be	Cd	Si	Hf	Al	Al	Al	3.763	0.412		
Be	Be	Ba	Zn	Si	Sn	Sn	2.153	0.675	Sr	Zn	Zn	Cd	Ge	Ti	Ti	Ti	2.767	0.691	Sr	Zn	Ti	Hf	Y	Y	Y	Y	3.226	0.681	Ca	Ca	Ca	Sr	Ti	Ti	Hf	3.763	0.599		
Sr	Sr	Zr	Hf	In	In	In	Y	2.153	0.449	Mg	Sr	Sn	Zr	Sc	Sc	Sc	2.767	0.727	Mg	Mg	Zn	Cd	Ti	Ti	Hf	Hf	3.226	0.683	Mg	Mg	Zn	Zn	Si	Ti	Ti	Zr	3.763	0.879	
Ca	Ba	Ge	Zr	Ga	Ga	Ga	2.154	0.581	Mg	Ba	Ba	Cd	Ge	Ge	Ge	Zr	2.767	1.077	Zn	Zn	Ge	Hf	Al	Al	Al	Sc	3.226	0.589	Be	Be	Si	Si	Ga	Sc	Sc	Y	3.763	0.393	
Ca	Sr	Ge	Ge	Al	Al	Al	Sc	2.154	0.606	Zn	Cd	Si	Si	Si	Ga	Ga	Sc	2.767	0.989	Be	Ca	Ti	Ti	Al	Ga	Ga	Ga	3.227	0.727	Mg	Mg	Sr	Ba	Si	Ti	Ti	3.763	0.526	
Be	Ca	Sr	Zn	Sn	Sn	Sn	2.155	0.396	Cd	Cd	Ti	Hf	Ga	Ga	Ga	Sc	2.767	0.867	Sr	Ba	Ba	Zn	Sn	Ti	Ti	Ti	3.227	0.692	Be	Be	Ca	Ca	Sn	Sn	Ti	Zr	3.763	0.925	
Ca	Ca	Ge	Ti	Ga	Ga	Ga	Y	2.155	0.569	Mg	Sr	Zr	Zr	Zr	Ga	Ga	Y	2.767	0.964	Be	Mg	Cd	Cd	Si	Ge	Ge	Ge	3.227	0.777	Mg	Mg	Si	Zr	Al	Al	Sc	Sc	3.763	0.155
Ca	Ca	Sn	Hf	Al	Al	Al	Y	2.155	0.602	Zn	Cd	Ti	Zr	Ga	Ga	Ga	2.767	0.913	Mg	Mg	Ge	Hf	Al	Al	Ga	Ga	3.227	0.792	Mg	Mg	Sr	Sr	Ge	Ti	Ti	Zr	3.763	0.162	
Cd	Cd	Ti	Zr	Al	Al	In	2.155	0.389	Be	Be	Sn	Sn	Al	Al	Ga	In	2.767	1.033	Mg	Mg	Mg	Zn	Zn	Si	Si	Sn	Zr	3.227	0.664	Mg	Ca	Ca	Zn	Ge	Ti	Ti	Zr	3.763	0.321
Be	Ca	Sn	Sn	Sc	Y	Y	Y	2.155	0.720	Sr	Ba	Zr	Zr	Ga	Ca	Sc	2.767	1.090	Be	Mg	Mg	Zn	Zn	Sn	Sn	Ti	3.227	0.734	Be	Zn	Ge	Hf	Al	Al	Al	3.763	1.248		
Sr	Zn	Ti	Ti	In	In	Y	Y	2.155	0.727	Mg	Ca	Zn	Zn	Ga	Sn	Sn	Ti	2.768	0.683	Be	Be	Hf	Hf	In	Sc	Sc	Y	3.227	0.857	Mg	Mg	Ti	Hf	Al	Al	Sc	Sc	3.764	1.149
Cd	Cd	Ti	Zr	In	In	Y	Y	2.155	0.380	Ba	Zn	Si	Ge	Al	Al	Al	2.768	0.833	Ca	Zn	Zn	Zn	Si	Si	Ti	Hf	3.227	0.649	Mg	Mg	Zn	Zn	Ti	Zr	Zr	Hf	3.764	1.019	
Ba	Zn	Ti	Ti	In	In	Y	Sc	2.156	0.643	Zn	Cd	Zr	Zr	Al	Ga	Ga	2.768	1.074	Ca	Sr	Zn	Zn	Si	Si	Ti	Ti	3.227	0.690	Be	Sr	Zn	Zn	Ti	Zr	Zr	3.764	1.337		
Sr	Sr	Zn	Zn	Si	Sn	Sn	Hf	2.156	0.670	Sr	Sr	Ti	Ti	Al	Al	Al	2.768	0.645	Zn	Cd	Zr	Zr	Al	Al	Al	Y	3.227	0.827	Be	Be	Mg	Zn	Sn	Ti	Ti	3.764	1.123		
Ca	Cd	Ge	Ti	Ga	Ga	Ga	2.156	0.722	Mg	Mg	Si	Si	In	In	In	Sc	2.768	0.795	Mg	Ba	Si	Zr	Al	Al	Al	Sc	3.227	1.333	Mg	Ca	Zn	Zn	Si	Si	Si	Ge	3.764	1.052	
Mg	Mg	Sr	Cd	Si	Sn	Sn	2.156	0.630	Mg	Sr	Cd	Cd	Si	Si	Zr	Zr	2.768	1.069	Be	Be	Be	Ba	Si	Sn	Ti	Ti	3.227	1.272	Mg	Mg	Sr	Sr	Si	Ti	Ti	Hf	3.764	0.584	
Sr	Ba	Zn	Zn	Sn	Sn	Sn	Hf	2.156	0.666	Ca	Cd	Ge	Hf	Al	Al	Al	2.768	0.914	Ca	Ca	Ba	Ba	Sn	Sn	Zr	Hf	3.227	1.211	Be	Mg	Zn	Zn	Si	Si	Si	Hf	Hf	3.764	0.586
Ca	Ba	Ti	Zr	In	In	In	2.156	0.715	Ba	Ba	Zn	Cd	Zr	Zr	Zr	Hf	2.769	1.192	Mg	Mg	Sn	Hf	Ga	Ge	Sc	Sc	3.228	1.393	Be	Be	Be	Ca	Si	Si	Zr	Hf	3.764	0.858	
Mg	Ba	Hf	Hf	In	In	Y	Y	2.156	0.767	Be	Be	Be	Cd	Zn	Zr	Hf	2.769	1.138	Mg	Cd	Ge	Zr	Y	Y	Y	Y	3.228	1.230	Be	Be	Be	Mg	Ge	Zr	Zr	Hf	3.764	0.487	
Mg	Ba	Hf	Hf	In	In	Y	2.156	0.774	Sr	Zn	Ti	Ti	Ga	Ga	Ga	Sc	2.769	0.671	Be	Be	Be	Zn	Cd	Ge	Ge	Zr	Hf	3.228	1.237	Mg	Cd	Si	Si	Sc	Sc	Sc	Y	3.765	0.474
Sr	Sr	Ge	Hf	Al	Al	Ga	Ga	2.157	0.698	Mg	Cd	Hf	Hf	In	Y	Y	Y	2.769	0.988	Mg	Mg	Si	Sn	Sc	Sc	Y	Y	3.228	0.827	Be	Be	Ca	Ba	Si	Si	Zr	Zr	3.765	0.884
Cd	Cd	Si	Ti	Al	Al	In	2.157	0.878	Sr	Sr	Si	Ti	Ga	Ga	Sc	Sc	2.769	1.116	Mg	Ca	Ca	Cd	Ge	Ge	Zr	Zr	3.228	0.829	Mg	Sr	Sr	Sr	Ge	Ge	Ti	Zr	3.765	1.372	
Mg	Sr	Ge	Ge	In	Sc	Sc	Sc	2.157	0.880	Zn	Zn	Hf	Hf	Al	Ga	Ga	In	2.769	0.631	Ca	Sr	Sr	Zn	Ge	Ge	Ge	Hf	3.228	1.065	Mg	Mg	Si	Zr	Sc	Y	Y	Y	3.765	1.248
Be	Ba	Zr	Zr	In	In	In	Y	2.157	0.757	Cd	Cd	Zr	Hf	Al	Al	Al	2.769	0.948	Mg	Ba	Ba	Zn	Zn	Si	Si	Si	Ge	3.228	0.708	Mg	Ca	Zn	Zn	Ti	Ti	Hf	Hf	3.766	1.296
Ba	Cd	Sn	Hf	Al	Al	Al	2.158	0.948	Mg	Mg	Si	Ti	Si	Ga	In	In	2.770	1.111	Mg	Mg	Sr	Sr	Si	Sn	Sn	Hf	3.228	0.706	Be	Sr	Sr	Ba	Ti	Ti	Ti	Zr	3.766	0.666	
Mg	Ba	Ge	Zr	Ga	Ga	Ga	2.158	1.027	Mg	Cd	Cd	Cd	Cd	Si	Si	Sn	Hf	2.770	0.749	Cd	Cd	Si	Zr	Al	Al	Al	Sc	3.228	1.082	Be	Sr	Zn	Zn	Ti	Ti	Hf	Hf	3.766	0.727
Be	Be	Ca	Cd	Ge	Sn	Sn	2.159	0.950	Be	Sr	Si	Si	Si	Ga	Ca	Sc	Sc	2.770	0.788	Mg	Sr	Ba	Ba	Ge	Ge	Ge	Sn	3.229	1.399	Mg	Mg	Mg	Zn	Si	Ti	Hf	Hf	3.767	1.083
Ba	Zn	Zn	Cd	Ge	Ge	Ge	Zr	2.159	1.130	Ca	Sr	Hf	Hf	Ga	Ga	Ga	Sc	2.770	0.914	Zn	Zn	Ge	Zr	Ga	Sc	Sc	Sc	3.229	1.288	Be	Zn	Zn	Zn	Ti	Zr	Zr	Hf	3.767	0.606
Ca	Sr	Ge	Ge	Al	Al	Al	Ga	2.159	1.170	Cd	Cd	Si	Zr	Ga	Ga	Sc	Sc	2.770	0.715	Mg	Zn	Cd	Cd	Cd	Sr	Zr	Zr	3.229	1.346	Be	Be	Sn	Ti	Al	Al	Ga	Ga	3.767	0.628
Sr	Cd	Hf	Hf	Ga	Ga	In	2.159	1.094	Sr	Zn	Zn	Zn	Ge	Sn	Ti	Ti	2.770	0.756	Zn	Zn	Cd	Cd	Ge	Ti	Ti	Zr	3.229	0.874	Mg	Mg	Mg	Ga	Ge	Sn	Sn	Ti	3.767	1.105	
Ba	Ba	Ge	Hf	Ga	Ga	Y	Y	2.159	0.945	Ca	Ca	Zr	Hf	In	Y	Y	Y	2.770	0.907	Be	Ca	Cd	Cd	Ti	Ti	Zr	Zr	3.229	0.901	Sr	Sr	Sr	Ba	Si	Ge	Ge	Ti	3.767	0.709
Ba	Ba	Ge	Ti	Al	Al	In	2.159	1.159	Be	Cd	Sn	Zr	Y	Y	Y	Y	2.770	0.770	Ca	Ca	Ca	Cd	Si	Si	Ge	Ti	3.229	1.158	Mg	Ca	Ba	Ba	Ge	Ge	Hf	3.767	0.951		
Be	Cd	Si	Si	In	In	In	Y	2.159	1.086	Ca	Zn	Cd	Cd	Sn	Zr	Zr	2.771	0.774	Ca	Cd	Hf	Hf	Sc	Y	Y	Y	Y	3.229	0.791	Be	Be	Be	Be	Sn	Ti	Zr	Hf	3.767	1.254
Mg	Cd	Sn	Sn	Al	Al	Sc	2.159	0.908	Mg	Ba	Ba	Zn	Zn	Sn	Sn	Sn	Zr	2.771	0.793	Be	Zn	Si	Si	Ga	Ga	Ga	Y	3.229	0.794	Mg	Mg	Ca	Zn	Si	Si	Hf	Hf	3.767	0.631
Ca	Ca	Cd	Cd	Si	Si	Sn	Hf	2.160	1.155	Ca	Ca	Ti	Hf	Ga	Ga	Ga	In	2.771	1.058	Be	Zn	Si	Si	Ga	Ga	Ga	Y	3.229	1.176	Be	Be	Mg	Ba	Si	Si	Si	Zr		

Zn	Cd	Ti	Ti	Gi	Ga	In	In	2.177	1028	Ca	Cd	Cd	Si	Si	Ti	Hi	2.779	0.689	Mg	Sr	Ti	Ti	Al	Al	Al	Ga	3.238	0.941	Mg	Mg	Mg	Sr	Ge	Ge	Ti	Zr	3.782	0.730		
Be	Ca	Ge	Ge	Al	Ga	Ga	Zr	2.177	1033	Be	Zn	Zr	Zr	Ga	Ga	Y	2.779	0.744	Mg	Ca	Ti	Ti	Gi	Ga	Sc	Sc	3.238	0.849	Be	Sr	Sr	Sr	Si	Ge	Zr	Zr	3.782	0.868		
Be	Be	Sr	Cd	Sn	Sn	Sn	Zr	2.177	1.204	Be	Mg	Mg	Ba	Cd	Sn	Sn	2.780	0.787	Be	Mg	Zn	Zn	Ge	Ge	Sc	Sn	3.238	0.905	Ca	Sr	Sr	Sr	Si	Ge	Ge	Zr	3.782	0.682		
Sr	Sr	Zn	Zn	Si	Sn	Sn	Zr	2.178	0.987	Be	Mg	Mg	Zn	Cd	Si	Si	2.780	0.666	Be	Zn	Zn	Cd	Ge	Ge	Zr	3.238	0.767	Be	Be	Be	Mg	Ca	Ge	Ge	Zr	3.782	0.715			
Be	Ba	Ge	Ge	Al	Al	Y	Y	2.178	1.000	Mg	Mg	Mg	Zn	Cd	Ge	Ge	2.780	0.734	Ca	Zn	Si	Si	Al	Al	Al	Y	3.238	0.768	Mg	Ca	Ca	Zn	Si	Ti	Ti	Ti	3.782	0.843		
Mg	Ba	Ba	Cd	Ge	Ge	Ge	Sn	2.178	1.197	Ca	Ca	Si	Ge	Ga	Sc	Sc	2.780	0.743	Ca	Sr	Si	Ti	Al	Al	Al	Al	3.238	0.835	Be	Sr	Sr	Sr	Si	Ge	Hi	Hi	3.783	0.883		
Ba	Ba	Si	Hi	In	In	In	Sc	2.178	0.979	Mg	Mg	Ge	Ge	Al	Al	In	2.780	0.725	Mg	Ba	Ba	Si	Si	Ge	Ge	Sn	3.238	0.719	Ca	Ca	Sr	Ba	Ge	Hi	Hi	Ti	3.783	0.884		
Sr	Cd	Cd	Cd	Si	Ge	Hi	Hi	2.178	0.863	Be	Ca	Ti	Ti	Gi	Ga	Y	2.780	0.731	Ca	Zn	Ge	Zr	Sc	Sc	Sc	Sc	3.238	0.717	Mg	Mg	Si	Ge	Al	Al	Al	Sc	3.784	0.817		
Sr	Sr	Sn	Hi	Al	Al	Y	Y	2.179	0.975	Be	Ca	Sn	Zr	Y	Y	Y	2.780	1.026	Zn	Zn	Ti	Hi	Al	Al	Al	In	3.239	0.888	Ti	Mg	Ca	Zn	Ti	Ti	Ti	Hi	3.784	0.802		
Ba	Ba	Zr	Zr	Al	In	In	In	2.179	0.920	Mg	Ca	Hi	Hi	Hi	Al	Al	Y	2.780	0.942	Mg	Ca	Hi	Hi	Al	Al	Al	Y	3.239	0.767	Be	Ca	Ca	Ba	Ge	Hi	Hi	Hi	3.784	0.885	
Sr	Ba	Si	Si	In	In	Y	Y	2.179	0.831	Sr	Ba	Ti	Ti	Al	Al	Al	In	2.780	1.052	Mg	Ba	Si	Zr	Sc	Sc	Sc	3.239	0.907	Be	Ca	Ca	Ba	Ge	Zr	Zr	Zr	3.784	0.682		
Sr	Cd	Ge	Ge	Al	Al	Sc	Sc	2.179	0.965	Ca	Sr	Ti	Zr	Ga	Ga	Ga	2.780	0.994	Ca	Sr	Ti	Zr	Y	Y	Y	Y	3.239	0.930	Mg	Ca	Ca	Sr	Si	Ge	Ge	Ge	3.784	0.702		
Sr	Cd	Ge	Ge	In	Sc	Sc	Sc	2.179	0.906	Be	Sr	Ti	Ti	Al	Y	Y	2.780	0.784	Mg	Mg	Mg	Cd	Ge	Ge	Zr	Hi	3.239	0.702	Be	Ca	Sr	Sr	Ti	Hi	Hi	Hi	3.784	0.778		
Ba	Ba	Ti	Hi	In	In	In	Sc	2.180	0.925	Be	Zn	Cd	Cd	Ge	Ge	Ge	2.781	0.987	Mg	Ba	Zn	Y	Y	Y	Y	Y	3.239	0.853	Mg	Ba	Zn	Zn	Zr	Hi	Hi	Hi	3.784	0.951		
Mg	Ba	Ge	Ge	Al	Al	Al	Sc	2.180	0.945	Mg	Sr	Sr	Cd	Si	Si	Ge	Ge	2.781	0.951	Mg	Sr	Sr	Zn	Ge	Hi	Hi	Hi	3.239	1.001	Mg	Mg	Mg	Sr	Si	Ti	Hi	Hi	3.785	0.957	
Ba	Ba	Zn	Zn	Cd	Sn	Sn	Ti	2.180	0.819	Ca	Sr	Sr	Zn	Sn	Sn	Hi	Hi	2.781	0.959	Ca	Ca	Sr	Zn	Si	Sn	Sn	Zr	3.239	0.699	Mg	Mg	Ca	Sr	Si	Ge	Ge	Ge	3.785	0.963	
Ca	Ca	Si	Ge	Al	Ga	Ga	Ga	2.181	0.885	Cd	Cd	Zr	Zr	In	Sc	Sc	Y	2.781	1.103	Mg	Mg	Ba	Ba	Si	Sn	Sn	Ti	3.239	0.767	Mg	Ca	Ca	Zn	Ti	Ti	Ti	Zr	3.785	1.021	
Cd	Cd	Si	Ge	In	Sc	Sc	Y	2.181	0.990	Zn	Cd	Cd	Cd	Si	Si	Ge	Hi	2.781	0.726	Mg	Ba	Ti	Ti	Sc	Sc	Y	Y	3.240	0.918	Be	Mg	Ba	Ba	Ge	Ge	Zr	Zr	3.785	0.942	
Mg	Zn	Si	Si	Gi	In	In	In	2.181	1.172	Cd	Cd	Zr	Zr	Al	Sc	Y	Y	2.781	0.757	Be	Mg	Hi	Hi	Sc	Y	Y	Y	3.240	1.185	Be	Mg	Ba	Ba	Ge	Ge	Hi	Hi	3.786	0.928	
Ca	Ca	Sn	Sn	Sc	Sc	Sc	Y	2.181	0.854	Ba	Cd	Zr	Zr	Al	Al	Al	Y	2.781	1.069	Be	Be	Sr	Zn	Si	Ge	Ge	Ge	3.240	1.128	Mg	Ca	Ca	Ba	Si	Hi	Hi	Hi	3.786	0.907	
Be	Cd	Sn	Sn	Ga	Sc	Sc	Sc	2.182	0.980	Mg	Ca	Si	Si	Gi	Ga	Y	Y	2.781	0.688	Sr	Ba	Ba	Ba	Ge	Sn	Hi	Hi	3.240	1.133	Mg	Mg	Sr	Sr	Si	Ge	Zr	Zr	3.786	0.843	
Mg	Sr	Si	Si	Gi	Ga	Ga	In	2.182	1.159	Mg	Ba	Hi	Hi	Al	Al	Ga	Ga	2.781	0.719	Mg	Mg	Sr	Cd	Si	Si	Zr	Zr	3.240	1.235	Mg	Cd	Si	Si	Al	Sc	Sc	Sc	3.787	0.863	
Sr	Sr	Sn	Ti	Gi	Ga	Ga	Sc	2.182	0.939	Ca	Ca	Ba	Cd	Ge	Hi	Hi	Hi	2.782	1.062	Mg	Mg	Si	Si	Gi	Ga	Sc	Y	3.240	1.092	Mg	Mg	Ba	Ba	Si	Si	Ti	Zr	3.787	0.888	
Cd	Cd	Si	Zr	Ga	Ga	Ga	In	2.183	0.958	Be	Ca	Ba	Zn	Sn	Sn	Hi	Hi	2.782	1.018	Mg	Mg	Si	Hi	Ga	Y	Y	Y	3.240	1.155	Be	Be	Ca	Ba	Si	Si	Ti	Ti	3.787	0.795	
Sr	Sr	Zn	Cd	Si	Si	Si	Sn	2.183	1.069	Be	Be	Sn	Hi	Al	Al	In	In	2.782	0.896	Mg	Mg	Sn	Hi	Sc	Sc	Sc	Y	3.240	0.830	Mg	Mg	Ba	Zn	Si	Si	Ti	Ti	3.787	0.845	
Ca	Cd	Hi	Hi	Al	In	In	In	2.183	0.830	Sr	Sr	Ti	Zr	Al	Al	Al	In	2.782	0.990	Be	Be	Mg	Zn	Sn	Hi	Hi	Hi	3.240	0.870	Be	Zn	Si	Hi	Sc	Sc	Sc	Sc	3.787	0.952	
Sr	Sr	Si	Ge	Al	Al	Al	In	2.183	0.843	Ca	Ca	Ca	Cd	Si	Si	Sn	Hi	2.782	0.949	Be	Cd	Cd	Cd	Sr	Zr	Hi	Hi	3.240	1.040	Be	Mg	Ba	Ba	Ge	Ge	Ti	Ti	3.787	0.852	
Be	Zn	Zn	Cd	Ge	Sn	Sn	Sn	2.184	0.764	Ca	Zn	Zn	Zn	Si	Si	Ge	Sn	2.782	1.065	Be	Mg	Ge	Ge	Al	Al	Ga	Ga	3.240	0.707	Ca	Ca	Ba	Si	Si	Ge	Zr	Zr	3.787	0.825	
Zn	Cd	Sn	Sn	Al	Sc	Sc	Sc	2.184	0.410	Zn	Cd	Hi	Hi	Ga	Ga	Ga	Y	2.783	1.111	Be	Mg	Mg	Ba	Sn	Hi	Hi	Hi	3.241	0.779	Be	Be	Si	Si	Al	Ga	Ga	In	3.787	0.877	
Ca	Ca	Cd	Cd	Si	Si	Sn	Zr	2.184	0.352	Ca	Ca	Ba	Cd	Sn	Hi	Hi	Hi	2.783	0.707	Be	Mg	Mg	Cd	Sn	Sn	Ti	Ti	3.241	1.068	Be	Zn	Cd	Cd	Si	Si	Zr	Zr	3.788	0.745	
Zn	Cd	Hi	Hi	In	In	Y	Y	2.185	0.269	Mg	Sr	Sr	Cd	Ge	Ge	Ti	Ti	2.783	0.851	Ca	Zn	Zn	Zn	Ti	Zr	Hi	Hi	3.241	1.161	Be	Ca	Sr	Sr	Ge	Ti	Ti	Ti	3.788	0.740	
Be	Zn	Sn	Sn	Ga	Ga	Sc	Sc	2.185	0.506	Mg	Sr	Si	Si	Al	Al	Ga	Ga	2.783	1.082	Mg	Mg	Ba	Ba	Si	Si	Ge	Sn	3.241	1.065	Mg	Mg	Mg	Zn	Si	Zr	Hi	Hi	3.788	0.898	
Ca	Ca	Ge	Ge	In	Sc	Sc	Y	2.185	0.488	Ca	Cd	Hi	Hi	In	Y	Y	Y	2.783	0.667	Mg	Ba	Ba	Zn	Ge	Ge	Ge	Ti	3.241	1.114	Cd	Cd	Hi	Hi	Al	Al	Al	3.788	0.707		
Mg	Sr	Ti	Ti	Gi	Ga	In	In	2.185	0.405	Be	Be	Cd	Cd	Si	Sn	Hi	Hi	2.783	0.810	Sr	Ba	Ba	Zn	Zr	Hi	Hi	Hi	3.241	0.790	Be	Sr	Sr	Sr	Si	Ge	Ti	Ti	3.788	0.722	
Be	Cd	Si	Si	Gi	Ga	Ga	In	2.185	0.421	Ba	Ba	Ge	Ti	Gi	Y	Y	Y	2.783	1.075	Ca	Ca	Ba	Zn	Ti	Ti	Hi	Hi	3.241	0.848	Ca	Ca	Ca	Sr	Si	Si	Ti	Zr	3.788	0.839	
Ca	Ca	Cd	Cd	Si	Ge	Zr	Zr	2.185	0.492	Mg	Mg	Ge	Ge	Al	Ga	Sc	Sc	2.783	0.982	Mg	Mg	Ca	Zn	Sn	Sn	Sn	Ti	3.242	0.984	Be	Be	Mg	Mg	Ge	Ge	Sn	Hi	3.788	0.861	
Zn	Cd	Si	Si	Gi	Ga	Ga	Ga	2.186	0.412	Be	Mg	Sn	Sn	Sn	Al	Al	Sc	Sc	2.783	1.256	Ca	Ca	Zr	Hi	Sc	Y	Y	Y	3.242	0.708	Be	Zn	Zn	Zn	Si	Ti	Zr	Zr	3.788	0.890
Mg	Cd	Si	Ge	Ga	Ga	Ga	Ga	2.186	0.403	Ba	Zn	Cd	Zr	Ga	Y	Y	Y	2.783	1.193	Mg	Mg	Ca	Sr	Sn	Sn	Sn	Zr	3.242	0.772	Be	Be	Ca	Ca	Sn	Ti	Ti	Hi	3.789	0.844	
Ba	Cd	Cd	Cd	Si	Sn	Ti	Ti	2.186	0.491	Sr	Cd	Ge	Hi	Sc	Sc	Sc	Sc	2.784	0.725	Be	Mg	Mg	Ba	Sn	Sn	Sn	Ti	3.242	1.016	Be	Be	Be	Mg	Si	Si	Sn	Zr	3.789	0.821	
Sr	Sr	Ge	Sn	Al	Al	Al	Zr	2.186	0.412	Ca	Cd	Cd	Cd	Ge	Ti	Zr	Zr	2.784	1.037	Zn	Zn	Si	Zr	Al	Al	Al	In	3.242	0.789	Be	Be	Si	Ti	Sc	Y	Y	Y	3.789	0.889	
Sr	Ba	Zn	Zn	Sn	Sn	Zr	Zr	2.186	0.707	Ba	Cd	Hi	Hi	Al	Al	Sc	Sc	2.784	1.159	Mg	Mg	Mg	Cd	Zn	Zr	Hi	Hi	3.242	0.991	Mg	Sr	Sr	Sr	Si	Si	Zr	Hi	3.789	0.715	
Ca	Ba	Zr	Hi	In	In	In	In	2.187	0.728	Be	Be	Zn	Zn	Si	Ge	Sn	Sn	2.784	0.684	Mg	Mg	Ti	Zr	In	In	Sc	Sc	3.242	1.086	Be	Ca	Sr	Zr	Hi	Hi	Hi	Hi	3.789	0.735	
Ba	Cd	Cd	Cd	Ge	Ge	Ti	Hi	2.187	0.434	Mg	Zn	Ge	Zr	Ga	Ga	Ga	Ga	2.784	0.996	Ca	Ca	Ba	Zn	Sn	Sn	Hi	Hi	3.242	0.691	Mg	Mg	Si	Zr	Ga	Sc	Sc	Sc	3.789	0.805	
Be	Zn	Sn	Sn	Al	Y	Y	Y	2.187	0.622	Ba	Cd	Ge	Zr	Y	Y	Y	Y	2.784	1.151	Be	Be	Ba	Zn	Si	Si	Ge	Ge	3.242	0.914	Mg	Ca	Ca	Ba	Si	Zr	Zr	Zr	3.789	0.664	
Sr	Zn	Ge	Ge	Al	Al	Al	Y	2.188	0.723	Zn	Zn	Cd	Cd	Si	Si	Sn	Ti	2.784	0.775	Be	Be	Zr	Hi	In	In	In	Sc	3.243	1.137	Mg	Mg	Sr	Zn	Si	Ti	Ti	Ti	3.789	0.536	
Mg	Ca	Si	Si	In	In	In	Sc	2.188	0.425	Sr																														

Mg	Ba	Ti	Ti	In	In	Y	Y	2.202	0.750	Ca	Ca	Zn	Cd	Sn	Ti	Ti	Ti	2.790	1.202	Be	Be	Be	Sr	Ge	Ge	Zr	Hf	3.251	0.655	Mg	Mg	Ti	Zr	Al	Al	Ga	Ga	3.804	1.092	
Sr	Sr	Si	Ge	Al	Al	Al	Y	2.202	0.918	Ca	Ca	Si	Hf	Al	Al	Al	Y	2.790	0.986	Sr	Sr	Ba	Zn	Zr	Zr	Hf	3.251	0.716	Mg	Ca	Ba	Ti	Ti	Ti	Zr	3.804	1.550			
Sr	Sr	Zn	Cd	Al	Si	Si	Zr	2.202	1.007	Be	Mg	Mg	Zr	Hf	In	In	In	2.791	1.020	Ca	Zn	Si	Si	Al	Y	Y	3.251	0.785	Mg	Ca	Ca	Ba	Ti	Ti	Ti	Zr	3.804	1.750		
Mg	Ca	Sn	Sn	Sn	Sc	Sc	Sc	Y	2.202	0.708	Zn	Zn	Ge	Zr	Ga	Ga	Sc	2.791	1.155	Ba	Ba	Ba	Ba	Ge	Sn	Zr	Hf	3.251	0.828	Be	Mg	Ge	Zr	Sc	Sc	Sc	3.804	0.818		
Sr	Ba	Zn	Cd	Ge	Ge	Ge	Ge	2.202	0.907	Be	Ba	Ba	Zn	Zn	Sn	Ti	Ti	2.791	0.980	Be	Mg	Zr	Zr	In	In	Sc	Sc	3.251	0.837	Be	Be	Mg	Sr	Si	Si	Zr	3.804	0.958		
Zn	Zn	Ge	Ge	Al	Ga	Ga	Y	2.203	0.992	Ca	Ba	Ba	Cd	Sn	Ti	Ti	2.791	0.987	Be	Cd	Ti	Ti	Sc	Sc	Y	Y	3.251	0.760	Mg	Mg	Mg	Sr	Si	Si	Ti	Zr	3.805	0.957		
Ca	Ba	Ge	Ti	Ga	Ga	Ga	Ga	2.203	0.688	Mg	Ca	Ge	Ge	Al	Al	Sc	Sc	2.791	1.146	Be	Be	Ti	Ti	Al	Ga	Y	Y	3.251	0.773	Be	Ba	Ba	Si	Si	Zr	Hf	3.805	0.710		
Zn	Cd	Cd	Cd	Ge	Sn	Sn	Hf	2.203	0.718	Sr	Cd	Ti	Ti	In	Y	Y	Y	2.791	0.793	Be	Be	Ca	Cd	Si	Ti	Ti	Ti	3.252	0.856	Be	Be	Ge	Zr	Al	Sc	Sc	3.805	0.643		
Ba	Ba	Si	Zr	In	In	Y	Y	2.203	0.861	Ca	Ba	Ge	Ti	Al	Al	Al	Al	2.791	0.679	Ca	Cd	Ti	Ti	In	Sc	Sc	Sc	3.252	0.699	Be	Zn	Zn	Zn	Si	Si	Ge	Zr	3.806	0.504	
Mg	Sr	Ge	Hf	Ga	Ga	Ga	Ga	2.203	0.775	Mg	Cd	Cd	Cd	Si	Si	Sn	Zr	2.791	0.730	Mg	Mg	Ba	Cd	Sn	Ti	Ti	Ti	3.252	0.728	Be	Mg	Cd	Cd	Si	Si	Ge	3.806	0.907		
Cd	Cd	Si	Ge	In	Y	Y	Y	2.204	0.944	Mg	Ba	Zn	Zn	Zr	Ti	Zr	Hf	2.791	0.791	Be	Zn	Zn	Cd	Ge	Ge	Hf	Hf	3.252	0.832	Mg	Mg	Sr	Zn	Ge	Ti	Ti	Ti	3.807	0.815	
Be	Ca	Ca	Cd	Ge	Sn	Sn	Sn	2.204	1.178	Sr	Sr	Sr	Zn	Ge	Sn	Zr	2.791	0.655	Ca	Zn	Sn	Ti	Sc	Sc	Sc	Sc	3.252	0.950	Mg	Mg	Zn	Zn	Si	Ge	Ti	Ti	3.807	0.541		
Ba	Ba	Cd	Cd	Sn	Ti	Hf	Hf	2.204	0.733	Ca	Sr	Zr	Zr	Ga	Y	Y	Y	2.791	0.718	Mg	Cd	Ti	Ti	Ga	Ga	Sc	3.252	0.960	Mg	Zn	Si	Ti	Y	Y	Y	Y	3.807	0.404		
Be	Sr	Ge	Hf	Ga	Ga	Ga	Ga	2.205	0.933	Sr	Sr	Sr	Ba	Zn	Sn	Sn	Hf	2.791	0.756	Be	Be	Be	Zn	Cd	Ti	Ti	Zr	3.252	1.003	Be	Mg	Sr	Sr	Ge	Ti	Ti	Ti	3.807	0.495	
Sr	Cd	Zr	Zr	Ga	Ga	In	In	2.205	1.163	Mg	Mg	Zn	Zn	Si	Sn	Sn	Zr	2.791	0.737	Be	Be	Si	Hf	Al	Al	In	In	3.252	1.003	Mg	Zn	Zr	Hf	Sc	Sc	Sc	3.807	0.408		
Be	Sr	Cd	Cd	Sn	Sn	Sn	Ti	2.205	0.702	Ca	Ca	Si	Sn	Sc	Y	Y	Y	2.791	0.743	Sr	Ba	Ba	Ba	Sn	Ti	Hf	Hf	3.252	0.925	Mg	Zn	Si	Ge	Al	Al	Al	Al	3.808	0.492	
Sr	Sr	Zn	Zn	Si	Ge	Ge	Sn	2.205	0.732	Sr	Ba	Ba	Cd	Zr	Zr	Hf	Hf	2.791	0.417	Mg	Zn	Zr	Zr	Ba	Ga	Ga	Y	3.252	0.984	Mg	Sr	Sr	Ba	Si	Si	Ti	Ti	3.808	0.625	
Mg	Ba	Zr	Zr	In	In	Y	Y	2.205	1.020	Sr	Zn	Ti	Ti	Al	Al	Y	Y	2.791	0.322	Be	Be	Sr	Ba	Si	Si	Sn	3.252	0.901	Be	Sr	Ba	Ba	Si	Si	Ti	Ti	3.808	0.467		
Mg	Cd	Sn	Sn	Ga	Sc	Sc	Sc	2.205	0.820	Sr	Zn	Zn	Sn	Ti	Ti	Zr	Hf	2.791	0.319	Ca	Ba	Si	Si	Al	Sc	Sc	Sc	3.252	0.851	Mg	Zn	Zn	Ge	Ti	Ti	Ti	Zr	3.809	0.949	
Sr	Sr	Zn	Zn	Sn	Sn	Zr	Hf	2.206	0.844	Sr	Zn	Hf	Hf	Ga	Y	Y	Y	2.791	0.660	Mg	Mg	Mg	Cd	Sn	Ti	Hf	Hf	3.252	0.911	Be	Ca	Zn	Zn	Si	Ti	Ti	Ti	3.809	0.911	
Be	Cd	Ge	Ge	Al	Ga	Ga	Sc	2.206	0.882	Ba	Ba	Si	Hf	Al	Al	Sc	Sc	2.791	0.349	Sr	Ba	Ti	Ti	Sc	Sc	Y	Y	3.252	0.849	Be	Be	Ca	Sr	Si	Si	Hf	Hf	3.809	0.766	
Ba	Zn	Ge	Ge	Al	Al	Sc	Sc	2.206	0.767	Mg	Sr	Zn	Sn	Sn	Hf	Hf	Hf	2.792	0.272	Mg	Mg	Zn	Cd	Si	Si	Hf	Hf	3.252	0.784	Zn	Zn	Si	Ti	Al	Sc	Sc	3.809	0.449		
Sr	Sr	Ti	Hf	In	In	In	Sc	2.207	0.758	Sr	Sr	Sr	Cd	Si	Ti	Ti	Hf	2.792	0.731	Mg	Ba	Ba	Zn	Si	Si	Ti	Ti	3.253	0.908	Mg	Sr	Ba	Ba	Ge	Ge	Zr	3.809	0.560		
Mg	Ba	Cd	Cd	Sn	Sn	Ti	Ti	2.207	0.656	Ba	Ba	Si	Zr	In	Sc	Sc	Sc	2.792	0.429	Be	Be	Sr	Zn	Ge	Ge	Ge	Ti	3.253	0.904	Mg	Mg	Mg	Ba	Si	Si	Ti	Hf	3.809	0.595	
Mg	Ba	Ba	Cd	Sn	Sn	Hf	Hf	2.207	0.836	Be	Be	Sn	Ti	Al	In	In	In	2.792	0.378	Ba	Cd	Si	Ti	Sc	Sc	Sc	Sc	3.253	0.803	Be	Be	Ca	Ca	Sn	Ti	Ti	Zr	3.810	0.554	
Zn	Cd	Ge	Ge	Ga	Y	Y	Y	2.207	0.854	Ca	Ca	Sr	Si	Hf	In	Sc	Sc	2.792	0.842	Ca	Ca	Zr	Hf	Sc	Sc	Y	Y	3.253	0.812	Mg	Sr	Ba	Ba	Ge	Ge	Ge	Hf	3.810	0.681	
Ba	Ba	Zn	Cd	Ge	Ge	Ge	Ti	2.208	0.748	Be	Ba	Ba	Cd	Ti	Ti	Ti	Hf	2.792	0.364	Ca	Sr	Sr	Zn	Si	Zr	Zr	Zr	3.253	0.835	Ca	Sr	Sr	Ba	Ge	Ge	Ge	Ti	3.810	0.636	
Sr	Sr	Si	Hf	In	In	In	Sc	2.208	0.665	Ca	Sr	Sr	Cd	Si	Zr	Zr	Zr	2.792	0.376	Sr	Sr	Sr	Zn	Ti	Zr	Zr	Hf	3.253	0.724	Mg	Mg	Ca	Zn	Ti	Ti	Ti	Zr	3.810	0.477	
Ba	Ba	Hf	Hf	Al	In	In	Y	2.208	0.812	Mg	Mg	Ge	Zr	Al	Al	In	In	2.792	0.855	Mg	Mg	Ba	Cd	Ge	Ge	Ti	Ti	3.253	0.723	Be	Mg	Mg	Sr	Zr	Hf	Hf	Hf	3.810	0.691	
Ba	Cd	Cd	Cd	Ge	Ge	Ti	Zr	2.208	0.707	Be	Mg	Ca	Sr	Sn	Sn	Sn	Sn	2.792	0.349	Ca	Zn	Zr	Zr	Ge	Al	Al	Al	In	3.253	0.824	Mg	Mg	Ti	Zr	Al	Al	Al	Y	3.811	0.865
Mg	Ba	Si	Si	In	In	Sc	Sc	2.208	0.633	Ba	Ba	Si	Hf	Al	Al	Y	Y	2.792	0.374	Ca	Ca	Ca	Sr	Si	Ge	Sn	Sn	3.253	0.672	Be	Be	Ge	Zr	Al	Al	Al	In	3.811	0.556	
Cd	Cd	Ge	Sn	Al	Al	Al	In	2.208	0.808	Be	Zn	Ge	Ge	Ga	Ga	Sc	Sc	2.792	0.966	Mg	Sr	Sr	Zn	Sn	Zr	Zr	Zr	3.253	0.724	Mg	Mg	Sr	Ba	Si	Si	Zr	Zr	3.812	0.806	
Cd	Cd	Ge	Sn	Al	Al	Al	Sc	2.209	0.700	Sr	Sr	Ge	Hf	Al	Y	Y	Y	2.792	0.494	Mg	Ca	Hf	Hf	Sc	Sc	Y	Y	3.253	0.802	Mg	Ca	Sr	Sn	Ti	Ti	Ti	Ti	3.813	0.919	
Sr	Sr	Cd	Cd	Si	Si	Si	Ti	2.209	1.022	Be	Be	Sr	Sr	Si	Sn	Sn	Zr	2.793	0.426	Be	Be	Ca	Zn	Zr	Hf	Hf	Hf	3.253	0.841	Be	Sr	Sr	Ba	Ge	Ge	Ti	Ti	3.813	0.399	
Sr	Zn	Si	Si	In	In	Sc	Sc	2.209	1.042	Be	Be	Ge	Ge	Al	Ga	Y	Y	2.793	0.762	Zn	Zn	Zn	Cd	Si	Ti	Ti	Ti	3.253	0.842	Mg	Mg	Ca	Zn	Si	Si	Zr	Zr	3.813	0.495	
Sr	Ba	Ge	Ge	Ga	Y	Y	Y	2.209	0.731	Ca	Sr	Si	Si	In	Y	Y	Y	2.793	0.571	Be	Be	Ge	Ti	Al	Al	Y	Y	3.253	0.776	Mg	Zn	Hf	Hf	Al	Al	Al	Sc	3.813	0.463	
Be	Be	Ge	Sn	Al	In	In	In	2.209	0.851	Ba	Ba	Zn	Zn	Sn	Ti	Ti	Ti	2.793	0.541	Be	Be	Sr	Ba	Ti	Zr	Zr	Zr	3.253	0.787	Be	Mg	Mg	Sr	Si	Zr	Zr	Zr	3.814	0.727	
Be	Sr	Sc	Sc	Y	Y	Y	Y	2.209	0.997	Mg	Sr	Sr	Cd	Si	Si	Hf	Hf	2.793	0.854	Mg	Mg	Ba	Ba	Ba	Ge	Sn	Ti	3.254	0.862	Ca	Ca	Ca	Ca	Si	Sn	Zr	Hf	3.814	0.696	
Ba	Cd	Cd	Cd	Ge	Sn	Ti	Ti	2.209	0.678	Zn	Cd	Ti	Ti	Al	Ga	Ga	Ga	2.793	0.486	Ba	Ba	Ba	Ba	Sn	Ti	Zr	Hf	3.254	0.722	Mg	Zn	Zn	Cd	Si	Si	Si	Ge	3.814	0.590	
Sr	Sr	Si	Zr	Ga	Ga	Ga	Y	2.210	0.818	Ba	Ba	Ge	Hf	Sc	Sc	Y	Y	2.793	0.537	Sr	Sr	Ba	Zn	Si	Ti	Ti	Ti	3.254	0.754	Be	Mg	Mg	Sr	Ti	Ti	Zr	Zr	3.815	0.870	
Cd	Cd	Ge	Ti	Ga	Ga	Ga	Y	2.210	0.989	Ca	Ba	Ba	Cd	Ti	Zr	Zr	Zr	2.793	0.864	Mg	Sr	Si	Zr	Y	Y	Y	Y	3.254	0.856	Be	Be	Ca	Ca	Sn	Ti	Ti	Zr	3.815	0.835	
Ca	Ca	Si	Ge	Ga	Ga	Y	Y	2.210	0.669	Mg	Ba	Cd	Cd	Sn	Zr	Zr	Zr	2.793	0.468	Mg	Cd	Cd	Cd	Ge	Ti	Hf	Hf	3.254	0.991	Mg	Ba	Ba	Ba	Si	Ge	Ti	Ti	3.815	0.597	
Ca	Ba	Zn	Zn	Si	Si	Sn	Sn	2.210	0.734	Zn	Zn	Zr	Hf	Ga	Ga	Ga	In	2.794	0.535	Ca	Ba	Ba	Zn	Ti	Ti	Ti	Ti	3.254	1.014	Sr	Ba	Ba	Ba	Si	Si	Ge	Ti	3.815	0.539	
Cd	Cd	Cd	Cd	Si	Ge	Sn	Hf	2.211	0.831	Ba	Ba	Si	Ti	Al	Al	Al	Sc	2.794	0.854	Mg	Mg	Ba	Cd	Si	Ti	Ti	Ti	3.254	1.050	Mg	Mg	Ge	Ti	Sc	Sc	Sc	Y	3.815	0.609	
Ca	Sr	Hf	Hf	In	In	In	Y	2.211	0.624	Ba	Ba	Ti	Hf	Al	Al	Y	Y	2.794	0.940	Be	Ba	Zn	Cd	Sn	Zr	Zr	Zr	3.255	1.049	Be	Mg	Ti	Ti	Ga	Sc	Sc	Sc	3.815	0.510	
Ba	Cd	Hf	Hf	Al	Al	In	In	2.211	0.702																															

Ca	Zn	Zn	Cd	Sn	Sn	Hf	Hf	2.224	0.800	Zn	Cd	Cd	Cd	Si	Ge	Ge	Zr	2.802	0.607	Be	Be	Ba	Ba	Sn	Zr	Hf	Hf	3.263	0.218	Mg	Ca	Sr	Sr	Si	Si	Zr	Zr	3.835	0.978	
Be	Sr	Ge	Ge	Ga	Sc	Sc	Sc	2.224	0.473	Sr	Sr	Zn	Zn	Ge	Ge	Ge	Ti	2.802	0.619	Sr	Sr	Ba	Ba	Sn	Ti	Hf	Hf	3.264	0.492	Mg	Mg	Ca	Ca	Si	Ge	Ge	Sn	3.835	0.767	
Be	Ba	Ba	Cd	Sn	Sn	Sn	Hf	2.225	0.724	Sr	Sr	Ge	Zr	Al	Al	Sc	Sc	2.803	0.802	Be	Be	Si	Hf	Al	Y	Y	Y	3.264	0.529	Mg	Sr	Sr	Ba	Ge	Ge	Ge	Ti	3.836	1.349	
Sr	Sr	Cd	Cd	Si	Si	Ti	Zr	2.225	0.756	Ca	Ba	Ba	Cd	Sn	Zr	Zr	Zr	2.803	0.579	Be	Zn	Ge	Ge	Al	Al	Sc	Sc	3.264	0.470	Be	Mg	Ba	Ba	Si	Si	Zr	Zr	3.836	1.157	
Zn	Zn	Si	Ge	Ga	Ga	Y	Y	2.225	0.803	Ca	Ba	Zr	Zr	Al	Al	Ga	Ga	2.803	0.583	Sr	Ba	Ba	Ba	Ge	Sn	Zr	Zr	3.264	0.604	Mg	Mg	Mg	Ba	Si	Si	Ge	Ti	3.836	0.837	
Cd	Cd	Zr	Hf	In	In	In	Sn	2.225	0.711	Sr	Sr	Sr	Cd	Si	Ti	Ti	Zr	2.803	0.797	Mg	Cd	Zr	Zr	Al	Al	Al	In	3.264	0.498	Be	Sr	Zn	Zn	Si	Si	Si	Hf	3.836	0.469	
Mg	Ba	Ge	Sn	Sc	Sc	Sc	Sc	2.225	0.753	Sr	Sr	Sr	Cd	Si	Ti	Ti	Zr	2.803	0.795	Mg	Cd	Zr	Zr	Al	Al	Al	Y	3.264	0.300	Be	Be	Mg	Zn	Si	Si	Ge	Ge	3.836	0.589	
Ba	Ba	Zn	Zn	Sn	Sn	Sn	Zr	2.225	0.796	Ca	Ba	Hf	Hf	Al	Al	Y	Y	2.803	1.016	Mg	Cd	Zr	Hf	Y	Y	Y	Y	3.264	0.842	Be	Be	Be	Mg	Ge	Ti	Hf	Hf	3.837	0.601	
Zn	Zn	Cd	Cd	Ge	Sn	Sn	Zr	2.225	0.840	Be	Be	Hf	Hf	Al	In	Y	Y	2.803	0.954	Be	Be	Ge	Ge	Al	In	Sc	Sc	3.265	0.691	Be	Mg	Ca	Sr	Ti	Ti	Ti	Ti	3.837	0.521	
Be	Ba	Ti	Ti	Ca	Ga	In	In	2.225	0.847	Be	Be	Ca	Cd	Sn	Sn	Zr	Zr	2.803	0.619	Be	Sr	Sr	Zn	Ti	Ti	Hf	Hf	3.265	0.348	Mg	Ca	Ca	Zr	Zr	Zr	Zr	Hf	3.838	0.690	
Be	Zn	Sn	Sn	Al	Al	Al	Ga	2.225	0.774	Be	Zn	Hf	Hf	Al	Y	Y	Y	2.803	0.829	Ca	Ba	Ba	Zn	Ge	Ge	Ge	Ti	3.265	0.206	Be	Ca	Zn	Zn	Ti	Zr	Zr	Zr	3.838	0.667	
Ba	Ba	Sn	Hf	In	Sc	Sc	Sc	2.225	0.964	Mg	Cd	Si	Zr	Ga	Ga	Ga	Ga	2.803	0.925	Mg	Ca	Ca	Cd	Ge	Ge	Ge	Ti	3.265	0.249	Mg	Mg	Ca	Ca	Ge	Ge	Sn	Hf	3.838	1.465	
Mg	Sr	Hf	Hf	In	In	Y	Y	2.226	0.968	Ca	Ca	Zn	Cd	Si	Hf	Hf	Hf	2.804	0.589	Mg	Ca	Si	Si	In	Sc	Sc	Sc	3.265	0.145	Be	Cd	Si	Zr	Al	Al	Al	Al	3.838	1.402	
Mg	Sr	Sr	Zn	Si	Sn	Sn	Sn	2.226	0.853	Be	Mg	Hf	Hf	Ga	Y	Y	Y	2.804	0.792	Be	Cd	Cd	Cd	Sn	Ti	Zr	Zr	3.265	0.398	Be	Be	Ti	Hf	Al	Al	Sc	Sc	3.838	1.280	
Ca	Ca	Ge	Hf	Ga	Ga	Y	Y	2.226	1.169	Zn	Zn	Sn	Zr	Al	Al	Sc	Sc	2.804	0.919	Zn	Zn	Zn	Cd	Si	Ge	Ti	Ti	3.265	0.431	Mg	Mg	Mg	Sr	Si	Si	Zr	Hf	3.838	0.596	
Be	Be	Si	Sn	In	In	In	Y	2.226	1.258	Mg	Zn	Zn	Zn	Ge	Ge	Sn	Hf	2.804	0.679	Mg	Sr	Ba	Ba	Sn	Sn	Hf	Hf	3.266	0.210	Be	Be	Ca	Ba	Si	Si	Ge	Ge	3.838	0.821	
Sr	Zn	Cd	Cd	Ge	Ge	Ge	Ge	2.226	1.190	Be	Be	Si	Ge	In	Y	Y	Y	2.804	0.675	Zn	Zn	Ti	Zr	Sc	Sc	Y	Y	3.266	0.914	Be	Be	Ca	Ca	Ge	Sn	Zr	Zr	3.839	1.010	
Sr	Sr	Zn	Zn	Si	Sn	Hf	Hf	2.226	1.363	Be	Be	Ge	Zr	Al	In	In	In	2.804	0.769	Zn	Zn	Ti	Zr	Sc	Sc	Y	Y	3.266	0.854	Be	Be	Be	Mg	Ge	Ge	Sn	Ti	3.839	0.663	
Ba	Ba	Ti	Zr	In	In	In	Sn	2.226	1.409	Sr	Ba	Ge	Zr	Sc	Sc	Sc	Sc	2.804	0.656	Ca	Ca	Si	Zr	Al	Y	Y	Y	3.266	0.698	Mg	Mg	Ca	Zn	Ge	Ge	Ge	Ti	3.840	0.916	
Mg	Zn	Si	Sn	Ga	Ga	Ga	Ga	2.227	1.343	Be	Be	Ca	Ba	Sn	Sn	Sn	Zr	2.804	0.647	Ca	Cd	Si	Hf	Y	Y	Y	Y	3.266	0.275	Be	Be	Ti	Ti	Al	Al	In	Sc	3.840	1.057	
Be	Be	Zn	Cd	Ge	Ge	Sn	Sn	2.227	1.163	Ca	Ba	Ca	Cd	Ge	Zr	Zr	Zr	2.804	0.761	Be	Be	Ca	Cd	Ge	Ti	Ti	Ti	3.266	0.369	Mg	Cd	Ti	Zr	Al	Al	Al	Al	3.840	0.691	
Mg	Mg	Si	Ge	In	In	In	Sn	2.227	1.396	Ba	Ba	Zn	Cd	Zr	Hf	Hf	Hf	2.804	0.722	Ca	Ca	Ba	Zn	Sn	Zr	Zr	Zr	3.267	0.436	Be	Mg	Mg	Ca	Sn	Sn	Hf	Hf	3.841	1.041	
Sr	Ba	Ti	Ti	Ga	In	In	In	2.227	1.332	Sr	Ba	Ba	Zn	Ge	Sn	Sn	Sn	Zr	2.804	0.720	Mg	Mg	Ca	Cd	Ti	Ti	Hf	Hf	3.267	0.478	Be	Be	Ca	Ca	Si	Ti	Hf	Hf	3.841	1.342
Be	Sr	Cd	Cd	Sn	Sn	Sn	Zr	2.227	1.124	Be	Sr	Si	Ge	Y	Y	Y	Y	2.804	0.736	Mg	Mg	Ti	Zr	Y	Y	Y	Y	3.267	0.532	Mg	Mg	Ti	Zr	Al	Si	Si	Hf	3.841	0.732	
Ca	Zr	Sr	Hf	In	In	In	In	2.227	1.391	Cd	Cd	Si	Ge	Al	Al	Sc	Sc	2.804	1.198	Be	Be	Be	Ba	Ge	Ge	Ti	Zr	3.267	0.467	Be	Sr	Ba	Ba	Si	Si	Hf	Hf	3.841	1.130	
Zn	Zn	Si	Si	Ga	In	In	Y	2.227	1.328	Be	Be	Cd	Cd	Sn	Sn	Ti	Hf	2.804	1.125	Ca	Ba	Ba	Ba	Zn	Si	Si	Ge	3.267	0.353	Mg	Mg	Si	Ti	In	Sc	Sc	Sc	3.841	1.403	
Sr	Zn	Ge	Sn	Al	Al	Al	Al	2.228	1.427	Sr	Ba	Hf	Hf	Al	Al	Al	Ga	2.804	1.234	Ca	Zn	Hf	Hf	Sc	Sc	Y	Y	3.267	0.580	Be	Cd	Si	Ti	Sc	Sc	Sc	Sc	3.841	0.476	
Mg	Ba	Hf	Hf	Al	In	In	In	2.228	1.380	Ca	Ca	Ca	Cd	Si	Si	Sn	Zr	2.805	1.152	Zn	Cd	Cd	Cd	Si	Si	Ti	Hf	3.267	0.790	Be	Be	Ge	Ti	Al	Ga	Ga	Ga	3.841	0.577	
Cd	Cd	Ge	Ge	Al	Al	Al	Ga	2.228	1.218	Mg	Cd	Cd	Cd	Sn	Sn	Ti	Zr	2.805	0.976	Be	Be	Be	Ca	Si	Si	Si	Hf	3.267	0.525	Be	Ca	Ca	Ba	Ti	Ti	Hf	Hf	3.841	0.588	
Be	Zn	Ge	Ge	Ga	Ga	Y	Y	2.228	1.222	Mg	Ba	Ba	Cd	Cd	Sn	Ti	Ti	2.805	1.181	Sr	Sr	Sr	Ba	Sn	Ti	Hf	Hf	3.267	0.734	Be	Sr	Ba	Ba	Ge	Ge	Ge	Hf	3.841	1.488	
Ba	Zn	Zn	Zn	Si	Si	Sn	Hf	2.229	1.360	Be	Sr	Si	Si	Al	Al	Ga	Ga	2.805	1.113	Ca	Ba	Ba	Zn	Sn	Ti	Ti	Ti	3.267	0.834	Mg	Mg	Ca	Sr	Ge	Ge	Hf	Hf	3.842	1.361	
Ba	Ba	Ba	Cd	Si	Sn	Hf	Hf	2.229	1.195	Mg	Cd	Hf	Hf	Ga	Ga	Y	Y	2.805	1.166	Be	Be	Mg	Ca	Ge	Ge	Sn	Sn	3.268	0.377	Mg	Ca	Ca	Sr	Ti	Hf	Hf	Hf	3.842	1.174	
Be	Be	Zn	Cd	Sn	Sn	Sn	Sn	2.229	1.182	Mg	Cd	Si	Si	Al	Al	Ga	Ga	2.805	1.322	Sr	Sr	Sr	Zn	Ge	Ti	Ti	Hf	3.268	0.430	Be	Be	Si	Hf	Al	Al	Sc	Sc	3.842	1.697	
Ca	Ca	Sn	Zr	Al	Al	Al	Y	2.229	1.355	Ca	Sr	Sr	Cd	Si	Si	Ge	Ge	2.805	0.862	Mg	Mg	Sn	Hf	Al	Al	Al	Sc	3.268	0.365	Be	Ca	Ca	Ba	Ti	Zr	Zr	Zr	3.842	1.534	
Sr	Sr	Ge	Hf	Al	Al	Al	In	2.229	1.189	Cd	Cd	Ge	Zr	In	Sc	Sc	Sc	2.806	0.970	Ca	Ca	Ba	Zn	Si	Zr	Zr	Zr	3.268	0.645	Mg	Ba	Ba	Ba	Si	Ge	Ge	Ge	3.843	1.239	
Mg	Ba	Ba	Cd	Sn	Sn	Zr	Zr	2.229	0.999	Ca	Ca	Sr	Cd	Si	Si	Si	Sn	2.806	1.304	Be	Be	Be	Sr	Si	Ti	Ti	Zr	3.268	0.573	Mg	Mg	Zn	Zn	Si	Si	Ge	Ti	3.843	0.867	
Mg	Ca	Si	Si	Al	In	In	In	2.230	1.170	Sr	Zn	Zn	Zn	Si	Si	Zr	Hf	2.806	0.819	Be	Mg	Mg	Zn	Si	Si	Sn	Sn	3.268	0.427	Be	Ca	Zn	Zn	Ti	Ti	Ti	Zr	3.843	1.021	
Cd	Cd	Cd	Cd	Si	Ge	Sn	Zr	2.230	1.221	Be	Be	Be	Zn	Sn	Sn	Zr	Hf	2.806	0.932	Be	Zn	Si	Ge	Y	Y	Y	Y	3.269	0.845	Be	Be	Si	Ti	Sc	Sc	Y	Y	3.843	1.026	
Zn	Zn	Si	Zr	In	In	In	Y	2.230	0.959	Ba	Ba	Ti	Zr	In	Sc	Sc	Sc	2.806	1.299	Mg	Mg	Mg	Cd	Sn	Zr	Zr	Hf	3.269	0.748	Mg	Ca	Ca	Zn	Zr	Hf	Hf	Hf	3.843	0.859	
Ba	Ba	Zn	Si	Zr	Ga	Ga	Ga	2.230	1.162	Be	Cd	Ti	Ti	Ga	Ga	Ga	In	2.806	1.036	Be	Mg	Mg	Cd	Ge	Ge	Hf	Hf	3.269	0.468	Mg	Mg	Si	Ti	Al	Al	Ga	Ga	3.843	1.095	
Ba	Ba	Cd	Cd	Ge	Ti	Hf	Hf	2.230	1.209	Sr	Sr	Ba	Zn	Sn	Sn	Sn	Zr	2.806	1.134	Be	Be	Mg	Ba	Ba	Zr	Zr	Hf	3.269	0.398	Be	Zn	Sn	Zn	Al	Al	Al	Al	3.843	1.079	
Mg	Cd	Si	Sn	In	In	Y	Y	2.230	0.906	Ca	Ba	Ba	Cd	Ge	Ti	Ti	Ti	2.807	1.134	Be	Ca	Ti	Ti	Sc	Y	Y	Y	3.269	0.447	Be	Be	Mg	Sr	Si	Si	Si	Hf	3.843	1.800	
Ba	Ba	Zn	Zn	Si	Ge	Hf	Hf	2.231	0.937	Sr	Sr	Sr	Cd	Sn	Ti	Ti	Zr	2.807	1.064	Mg	Mg	Ba	Ba	Ge	Ge	Sn	Hf	3.269	0.328	Be	Mg	Mg	Ba	Si	Si	Sn	Sn	3.844	1.755	
Ca	Cd	Zr	Sr	Al	In	In	In	2.231	1.072	Be	Be	Si	Sn	In	In	Sc	Sc	2.807	1.211	Mg	Mg	Ca	Ba	Sn	Sn	Sn	Ti	3.269	0.568	Be	Ba	Zn	Zn	Zr	Zr	Zr	Hf	3.844	1.635	
Cd	Cd	Si	Sn	Al	Al	Al	Ga	2.231	1.384	Sr	Cd	Ge	Hf	Y	Y	Y	Y	2.807	1.273	Ca	Ca	Sr	Sr	Sn	Sn	Zr	Hf	3.269	0.620	Mg	Sr									

Sr	Zn	Zr	Zr	Al	In	In	In	2.247	1.312	Ca	Sr	Sr	Zn	Zn	Sn	Sn	Zr	Zr	2.815	0.683	Mg	Mg	Si	Si	Al	Ga	Ga	In	3.278	0.939	Mg	Mg	Mg	Ca	Si	Si	Sn	Hf	3.862	0.576
Ba	Ba	Al	Al	Hf	Ga	In	In	2.247	1.093	Sr	Sr	Zn	Zn	Al	Al	Al	Hf	Hf	2.815	0.885	Mg	Ca	Ca	Ca	Al	Al	Zr	Zr	3.278	0.781	Mg	Mg	Si	Zr	Sc	Sc	Sc	Y	3.862	0.632
Ba	Cd	Cd	Cd	Cd	In	Al	Hf	2.247	1.113	Mg	Ca	Al	Al	Al	In	In	Sc	Sc	2.816	1.194	Be	Cd	Ga	Hf	Sc	Sc	Sc	Sc	3.279	0.453	Mg	Mg	Ca	Al	Sc	Sc	Sc	Zr	3.863	0.711
Ca	Ca	Si	Si	Al	In	In	Sc	Y	2.247	1.219	Mg	Zn	Hf	Hf	Al	In	In	2.816	0.999	Ca	Ba	Al	Al	Al	Al	Al	Al	3.279	0.266	Be	Be	Ca	Al	Al	Al	Al	Zr	3.863	0.588	
Ba	Ba	Cd	Cd	Si	Al	Al	Hf	2.248	0.980	Mg	Zn	Zr	Zr	Ga	Ga	Y	Y	2.816	0.987	Mg	Mg	Zn	Cd	Si	Zr	Zr	Y	3.279	0.350	Be	Sr	Sr	Ca	Si	Ge	Ge	Al	3.863	0.903	
Be	Cd	Si	Si	In	In	Y	Y	2.248	0.994	Mg	Ca	Si	Si	Ga	Ga	Sc	2.816	1.096	Mg	Ca	Zr	Zr	Sc	Sc	Sc	Sc	Y	3.280	0.252	Be	Ca	Sr	Zn	Si	Si	Si	Si	3.864	0.876	
Be	Cd	Cd	Cd	Si	Ge	Sn	Sn	2.248	0.919	Mg	Ca	Sr	Sr	Zn	Ge	Ge	Sn	2.816	1.057	Mg	Zn	Si	Zr	Sc	Sc	Sc	Sc	3.280	0.430	Mg	Mg	Mg	Ca	Si	Sn	Hf	Hf	3.864	0.747	
Be	Ba	Ba	Cd	Sn	Sn	Al	Al	2.249	0.408	Be	Ca	Zr	Zr	Al	Al	In	In	2.816	1.094	Mg	Mg	Cd	Cd	Si	Al	Al	Hf	3.280	0.529	Be	Mg	Mg	Ba	Si	Si	Ge	Ge	3.864	0.582	
Ca	Cd	Sn	Sn	Sc	Y	Y	Y	2.249	0.412	Mg	Cd	Ge	Ge	Ga	Sc	Sc	2.816	1.031	Ca	Zn	Zn	Zn	Si	Si	Al	Hf	3.280	0.321	Be	Ca	Ba	Ba	Si	Si	Al	Al	3.865	0.596		
Ca	Ba	Al	Al	In	In	In	Sc	2.249	0.335	Mg	Sr	Sr	Cd	Si	Si	Zr	Zr	2.816	0.889	Be	Zn	Sn	Hf	Sc	Sc	Sc	3.280	1.007	Be	Zn	Si	Zr	Sc	Sc	Sc	Sc	3.865	0.619		
Sr	Sr	Al	Al	Hf	In	In	Y	2.250	0.579	Be	Be	Zn	Cd	Sn	Sn	Hf	Hf	2.816	1.065	Mg	Mg	Sn	Al	Al	Al	Ga	Ga	3.280	0.957	Be	Ca	Ba	Zr	Hf	Hf	Hf	3.866	0.636		
Ca	Ba	Ba	Cd	Sn	Sn	Sn	Hf	2.250	0.558	Zn	Zn	Zn	Zr	Sc	Sc	Y	Y	2.816	1.019	Zn	Zn	Zr	Hf	Ga	Sc	Sc	Sc	3.280	0.806	Mg	Zn	Si	Si	Al	Al	Sc	Sc	3.866	0.647	
Sr	Sr	Sn	Zr	Al	Al	Y	Y	2.250	0.482	Be	Sr	Sr	Cd	Ge	Ge	Ge	Zr	2.816	0.857	Be	Be	Mg	Sr	Ge	Ge	Ge	Sn	3.280	0.329	Mg	Zn	Zn	Zn	Si	Si	Al	Hf	3.866	0.616	
Sr	Zn	Zn	Zr	Ge	Ge	Sn	Hf	2.250	0.497	Ca	Cd	Zr	Zr	Al	Al	Y	Y	2.816	1.058	Sr	Sr	Sr	Zn	Ge	Al	Al	Y	3.280	0.484	Mg	Mg	Sr	Ba	Si	Si	Si	Zr	3.866	0.584	
Be	Sr	Ge	Ge	Al	Y	Y	Y	2.250	0.567	Sr	Ba	Ba	Cd	Ge	Ge	Ge	Ge	2.816	1.113	Be	Be	Si	Sn	Ga	Ga	Ga	Sc	3.280	0.548	Be	Be	Sn	Zr	Al	Al	Al	Sc	3.866	0.687	
Cd	Cd	Zr	Zr	Ga	In	Y	Y	2.250	0.494	Be	Be	Be	Cd	Sn	Sn	Al	Hf	2.816	1.306	Mg	Ca	Al	Al	In	Sc	Sc	Sc	3.280	0.503	Be	Mg	Zn	Zn	Zr	Zr	Hf	Hf	3.866	0.835	
Sr	Zn	Al	Al	Al	In	In	Sc	2.250	0.478	Zn	Zn	Si	Sn	Sc	Y	Y	Y	2.817	1.331	Be	Sr	Sr	Zn	Al	Al	Al	Al	3.280	0.644	Be	Ca	Ba	Si	Zr	Zr	Zr	3.867	0.615		
Sr	Sr	Si	Si	Ga	Ga	In	Sc	2.250	0.566	Be	Be	Be	Hf	Al	Sc	Sc	Sc	2.817	1.047	Be	Be	Be	Sr	Ge	Sn	Al	Al	3.281	0.585	Be	Be	Mg	Sr	Ge	Ge	Al	Al	3.867	0.733	
Ba	Ba	Zn	Zn	Sn	Sn	Al	Hf	2.250	0.494	Sr	Ba	Ba	Cd	Zr	Hf	Hf	Hf	2.817	1.146	Mg	Sr	Al	Hf	Sc	Sc	Sc	Sc	3.281	0.408	Be	Be	Al	Hf	Al	Sc	Sc	Sc	3.867	0.844	
Be	Sr	Zr	Zr	In	In	In	Y	2.251	0.768	Zn	Zn	Hf	Hf	Al	Al	Ga	In	2.817	1.300	Mg	Mg	Mg	Cd	Cd	Ge	Zr	Hf	3.281	0.685	Mg	Mg	Sr	Ba	Si	Si	Si	Ge	3.868	0.546	
Mg	Mg	Cd	Cd	Si	Ge	Sn	Sn	2.251	0.786	Sr	Sr	Hf	Hf	Al	Sc	Sc	Sc	2.817	1.036	Zn	Zn	Ge	Al	Al	Sc	Sc	Sc	3.281	0.887	Be	Be	Ca	Ge	Al	Al	Al	Al	3.868	0.626	
Zn	Zn	Si	Sn	Ga	Y	Y	Y	2.251	0.509	Ba	Cd	Al	Al	Al	Al	Y	Y	2.817	1.115	Mg	Cd	Ge	Al	Al	Ga	Sc	Sc	3.281	0.553	Mg	Mg	Si	Si	Al	Al	Ga	Sc	3.868	0.617	
Ba	Ba	Sn	Al	Al	Al	Al	Ga	2.251	0.684	Mg	Cd	Cd	Cd	Si	Sn	Hf	Hf	2.817	1.293	Mg	Zn	Zn	Cd	Ge	Ge	Ge	Al	3.281	0.836	Be	Mg	Sr	Sr	Ge	Ge	Hf	Hf	3.868	0.875	
Ca	Sr	Zr	Zr	In	In	In	Y	2.252	0.786	Cd	Cd	Ge	Ge	Al	Al	Sc	2.817	0.908	Be	Be	Zr	Zr	Al	Ga	In	In	3.281	0.937	Be	Ca	Ba	Al	Al	Hf	Hf	Hf	3.869	0.807		
Be	Sr	Sr	Zn	Ge	Ge	Sn	Sn	2.252	0.505	Zn	Zn	Zn	Zn	Si	Ge	Sn	Hf	2.817	0.822	Ca	Cd	Al	Al	Al	Al	Sc	Sc	3.281	0.418	Be	Be	Si	Al	Ga	Sc	Sc	3.869	0.714		
Ba	Ba	Cd	Cd	Si	Si	Hf	Hf	2.252	0.665	Ba	Ba	Ba	Cd	Si	Si	Ge	Al	2.818	0.890	Mg	Mg	Ba	Ba	Al	Ge	Sn	Zr	3.281	0.495	Be	Mg	Mg	Sr	Al	Al	Al	Al	3.869	0.960	
Ca	Ca	Sn	Al	Al	Ga	Ga	Ga	2.252	0.784	Ca	Ba	Zr	Zr	In	Sc	Sc	Sc	2.818	0.901	Zn	Cd	Si	Ge	Sc	Sc	Sc	Sc	3.281	0.437	Mg	Mg	Ca	Ba	Si	Al	Al	Al	3.869	0.773	
Sr	Sr	Al	Al	Hf	Ga	In	In	2.252	0.503	Cd	Cd	Ge	Al	Al	Al	Al	Ga	2.818	0.798	Mg	Mg	Hf	Hf	In	Sc	Sc	Sc	3.281	0.738	Mg	Ca	Ca	Ba	Si	Si	Hf	Hf	3.870	0.735	
Mg	Ba	Zn	Zn	Ge	Ge	Sn	Sn	2.252	0.675	Sr	Cd	Zr	Zr	Al	Al	Al	In	2.818	0.880	Ba	Zn	Zr	Hf	Sc	Sc	Sc	Sc	3.281	0.651	Be	Mg	Mg	Sr	Ge	Ge	Hf	Hf	3.870	0.358	
Zn	Zn	Zn	Cd	Si	Sn	Sn	Hf	2.252	0.723	Ba	Ba	Ge	Zr	Al	Y	Y	Y	2.818	0.878	Be	Be	Ba	Ba	Sn	Al	Al	Al	3.281	0.512	Be	Mg	Ba	Ba	Si	Si	Al	Al	3.870	0.317	
Ba	Ba	Zr	Hf	In	Y	Y	Y	2.253	0.446	Be	Mg	Zn	Zn	Ge	Ge	Sn	Sn	2.818	0.862	Sr	Zn	Al	Hf	Al	Al	Al	Al	3.281	0.931	Mg	Mg	Mg	Ca	Ge	Sn	Zr	Zr	3.871	0.546	
Ca	Ba	Ge	Ge	In	Y	Y	Y	2.253	0.656	Sr	Sr	Si	Zr	In	Y	Y	Y	2.818	0.872	Be	Cd	Zr	Zr	Ga	Ga	Ga	Sc	3.281	0.826	Be	Ca	Ba	Ge	Ge	Hf	Hf	3.871	0.307		
Mg	Ca	Ge	Ge	Ga	Ga	Sc	Sc	2.253	0.717	Ba	Zn	Hf	Hf	Al	Al	Y	Y	2.818	1.163	Ca	Ca	Sr	Ba	Sn	Sn	Sn	Zr	3.282	0.560	Mg	Ca	Ca	Sr	Si	Si	Ge	Ge	3.871	0.226	
Ca	Ca	Cd	Cd	Si	Ge	Ge	Ge	2.253	0.437	Be	Be	Sr	Cd	Zr	Zr	Zr	Hf	2.818	1.090	Sr	Sr	Ba	Ba	Ge	Sn	Zr	Zr	3.282	0.445	Be	Be	Si	Zr	Ga	Sc	Sc	Sc	3.872	0.569	
Mg	Mg	Ge	Sn	Al	Y	Y	Y	2.253	0.794	Ca	Ba	Ba	Zn	Sn	Sn	Sn	Hf	2.818	1.202	Be	Be	Si	Ge	Al	Al	Y	Y	3.282	0.533	Mg	Mg	Mg	Zn	Zn	Al	Al	Al	3.872	0.962	
Ba	Ba	Al	Al	Zr	Al	In	In	2.253	0.804	Mg	Mg	Sn	Hf	Ga	Y	Y	Y	2.818	1.108	Sr	Sr	Ba	Zn	Ge	Al	Al	Al	3.282	0.422	Be	Be	Ca	Ge	Al	Zr	Zr	3.872	0.833		
Sr	Ba	Hf	Hf	Al	In	In	In	2.253	0.407	Sr	Sr	Al	Hf	Ga	Y	Y	Y	2.819	0.931	Be	Be	Mg	Ba	Sn	Sn	Zr	Zr	3.282	0.587	Mg	Mg	Al	Zr	Al	Al	In	3.872	0.877		
Be	Be	Sr	Cd	Si	Si	Sn	Sn	2.253	0.801	Be	Sr	Al	Al	Ga	Ga	Ga	Ga	2.819	1.136	Ca	Sr	Zr	Sc	Sc	Sc	Sc	Sc	3.282	0.705	Mg	Ca	Al	Al	Al	Al	Al	3.872	0.403		
Sr	Sr	Hf	Hf	In	In	Sc	Y	2.254	0.821	Ba	Zn	Sn	Al	Y	Y	Y	Y	2.819	1.074	Be	Ca	Ge	Hf	Al	Al	Al	Al	3.282	0.493	Be	Mg	Mg	Ba	Ge	Ge	Ge	Al	3.872	0.390	
Ba	Cd	Al	Al	Al	Ga	Ga	In	2.254	0.620	Ca	Ba	Zn	Zr	Al	Al	Al	Hf	2.819	1.120	Ba	Ba	Ba	Ba	Si	Sn	Zr	Hf	3.282	0.971	Zn	Zn	Si	Al	Al	Al	Al	3.872	0.671		
Be	Ca	Cd	Cd	Sn	Sn	Sn	Hf	2.254	0.701	Ca	Sr	Zr	Zr	Zr	Ga	Ga	Sc	2.819	1.268	Be	Sr	Sr	Zn	Si	Al	Al	Al	3.282	0.940	Mg	Mg	Sr	Sr	Si	Si	Zr	Hf	3.872	0.390	
Mg	Mg	Si	Sn	Ga	Ga	Ga	In	2.254	0.814	Ca	Ba	Zr	Zr	Al	Al	Al	In	2.819	0.817	Be	Be	Ca	Ba	Ge	Ge	Ge	Zr	3.282	0.802	Ca	Ca	Sr	Sr	Si	Si	Ge	Al	3.872	0.314	
Be	Ca	Si	Si	Al	In	In	In	2.254	0.606	Be	Be	Si	Sn	Al	Al	In	In	2.819	0.912	Mg	Sr	Al	Al	Al	Sc	Sc	Sc	3.283	0.474	Be	Be	Mg	Sr	Si	Si	Si	Zr	3.872	0.693	
Sr	Sr	Al	Al	In	In	In	Sc	2.254	0.679	Be	Mg	Al	Zr	In	In	In	In	2.820	1.238	Be	Cd	Zr	Zr	Al	Al	Sc	Sc	3.283	0.597	Be	Ca	Ca	Ca	Si	Si	Ge	Al	3.873	0.432	
Sr	Ba	Cd	Cd	Si	Si	Al	Al	2.254	0.812	Be	Be	Sr	Ba	Sn	Sn	Sn	Al	2.820	0.774	Be	Be	Mg	Ba	Zr	Hf	Hf	Hf	3.283	0.606	Ca	Ca	Sr	Ba	Si	Si	Si	Zr	3.873	0.600	
Ba	Ba	Zr	Zr	Al	In	In	Y	2.2																																

Mg	Zn	Si	Ti	In	In	In	In	2.267	0.895	Be	Ca	Cd	Cd	Si	Ge	Ge	Ge	2.827	0.727	Be	Be	Ca	Zn	Ti	Ti	Zr	Zr	3.293	0.806	Mg	Mg	Ca	Ba	Si	Si	Zr	Zr	3.896	0.730	
Ca	Ca	Zn	Cd	Sn	In	Ti	Ti	2.267	0.884	Cd	Sr	Sr	Cd	Ge	Ge	Ge	Zr	2.827	0.955	Be	Be	Ge	Hf	Sc	Sc	Y	Y	3.293	0.587	Be	Sr	Sr	Ba	Si	Si	Hf	Hf	3.896	0.640	
Mg	Cd	Ge	Ge	Al	Al	Ga	Ga	2.267	0.786	Cd	Sr	Cd	Cd	Ge	Ti	Zr	Hf	2.827	0.759	Be	Be	Ba	Ba	Sn	Ti	Ti	Zr	3.293	1.055	Be	Sr	Zr	Hf	Al	Al	Ga	Ga	3.896	0.730	
Mg	Mg	Si	Sn	In	In	Sc	Sc	2.267	0.964	Sr	Zn	Si	Si	Al	Al	Al	In	2.827	0.805	Zn	Zn	Cd	Cd	Si	Si	Ti	Zr	3.294	1.037	Be	Ca	Ca	Ba	Si	Si	Ge	Ge	3.896	0.724	
Ba	Zn	Ge	Ge	Al	Al	Al	Sc	2.267	0.982	Be	Ca	Ge	Ge	Sc	Y	Y	Y	2.827	0.909	Mg	Ba	Ba	Zn	Ti	Zr	Zr	Zr	3.294	0.896	Be	Be	Mg	Mg	Sn	Sn	Zr	Hf	3.896	0.577	
Sr	Ca	Hf	Hf	In	In	In	Sc	2.268	0.881	Ca	Sr	Zn	Zn	Si	Si	Zr	Zr	2.827	0.591	Be	Be	Ba	Ca	Sn	Ti	Ti	Hf	3.294	0.532	Be	Be	Sn	Zr	Al	Al	Al	Ga	3.897	0.725	
Ca	Ca	Ge	Ti	Ti	In	In	Sc	2.268	0.797	Zn	Zn	Zn	Sn	Al	Al	Al	Y	2.827	0.756	Mg	Mg	Zn	Zn	Cd	Ge	Hf	Hf	3.294	0.702	Be	Mg	Mg	Sr	Ge	Ge	Zr	Zr	3.898	0.711	
Be	Ca	Cd	Cd	Sn	Sn	Sn	Zr	2.268	0.942	Be	Be	Sr	Cd	Ti	Ti	Ti	Hf	2.827	0.900	Mg	Cd	Cd	Cd	Si	Ge	Ti	Ti	3.294	0.700	Be	Ba	Ba	Ba	Si	Si	Ti	Zr	3.898	0.790	
Ca	Zn	Ti	Ti	Ti	In	In	Y	2.268	0.842	Mg	Mg	Zr	Zr	Ga	In	Y	Y	2.828	0.560	Ca	Sr	Ti	Zr	Sc	Sc	Sc	Sc	3.294	0.655	Be	Sr	Sr	Ba	Ge	Ge	Hf	Hf	3.898	0.879	
Sr	Sr	Hf	Hf	Ga	In	In	Y	2.268	0.765	Ca	Ca	Ge	Zr	Ga	Y	Y	Y	2.828	0.747	Zn	Zn	Zr	Hf	Al	Al	Sc	Sc	3.294	0.845	Mg	Mg	Sr	Ba	Si	Si	Ti	Ti	3.898	0.688	
Ba	Si	Si	Hf	Ga	Ga	Ga	Sc	2.268	0.935	Be	Ca	Sr	Sr	Si	Sn	Sn	Sn	2.829	1.065	Be	Be	Hf	Hf	Ga	In	In	Sc	3.294	0.732	Mg	Zn	Zr	Zr	Al	Al	Al	Sc	3.899	0.896	
Mg	Ba	Ba	Zr	Zr	Al	In	In	2.269	0.834	Ca	Sr	Hf	Hf	In	Sc	Sc	Sc	2.829	0.874	Mg	Mg	Zr	Zr	Ga	Ga	Sc	Y	3.294	0.590	Ca	Sr	Sr	Sr	Si	Si	Ge	Ti	3.899	0.726	
Be	Cd	Ge	Ge	Ga	Y	Y	Y	2.269	1.141	Ba	Zn	Ti	Ti	Al	Al	Ga	Ga	2.829	0.863	Be	Sr	Si	Si	Al	Al	Al	Sc	3.294	0.847	Mg	Zn	Si	Si	Al	Al	Al	Ga	3.899	0.552	
Mg	Sr	Zr	Zr	In	In	In	Y	2.269	1.167	Ca	Cd	Si	Sn	Sc	Sc	Sc	Sc	2.829	1.015	Mg	Mg	Cd	Cd	Ti	Ti	Ti	Hf	3.294	0.977	Mg	Mg	Mg	Zn	Ge	Ti	Ti	Hf	3.899	0.571	
Ba	Zn	Cd	Cd	Ti	Ti	Zr	Zr	2.269	0.867	Ca	Zn	Cd	Cd	Si	Si	Ge	Ge	2.829	0.941	Be	Sr	Zn	Zn	Ge	Ge	Ge	Zr	3.294	0.683	Be	Zr	Hf	Al	Ga	Ga	Ga	Ga	3.900	0.685	
Sr	Sr	Zr	Hf	In	In	In	Y	2.269	0.973	Ba	Ba	Ge	Ti	Sc	Sc	Sc	Sc	2.829	0.964	Be	Sr	Sr	Sr	Si	Si	Ge	Sn	3.295	0.981	Ca	Ca	Ca	Ca	Si	Ge	Sn	Hf	3.900	0.981	
Sr	Sr	Ti	Zr	Al	In	In	In	2.270	1.124	Ca	Zn	Zr	Zr	Ga	Ga	Ga	In	2.829	0.961	Be	Be	Sr	Sr	Ti	Zr	Zr	Hf	3.295	1.023	Be	Ca	Ca	Sr	Ti	Zr	Zr	Zr	3.900	0.994	
Ba	Ba	Ge	Ge	Ga	Sc	Y	Y	2.270	0.816	Ba	Cd	Hf	Hf	Al	Y	Y	Y	2.829	0.766	Be	Ca	Hf	Hf	Al	Al	Al	Y	3.295	0.619	Be	Sr	Zn	Zn	Zr	Zr	Zr	Hf	3.900	1.015	
Zn	Zn	Sn	Hf	Ga	Ga	Ga	Y	2.270	0.941	Be	Be	Cd	Hf	Ge	Ge	Sn	Ti	2.829	0.924	Be	Be	Ti	Hf	Al	Al	In	In	3.295	0.731	Mg	Mg	Cn	Zn	Ti	Zr	Hf	Hf	3.901	1.045	
Mg	Ca	Sn	Sn	Sc	Sc	Y	Y	2.270	1.116	Ca	Ca	Hf	Hf	In	Sc	Y	Y	2.829	0.951	Mg	Ba	Ba	Zn	Ti	Ti	Hf	Hf	3.295	0.680	Ca	Ca	Ca	Ba	Si	Si	Ge	Ti	3.901	0.968	
Be	Ge	Ge	Sn	Ga	Ga	Y	Y	2.270	0.807	Be	Ba	Ba	Ge	Ge	Ge	Zr	Zr	2.829	0.734	Mg	Sr	Ba	Ba	Si	Ge	Ge	Ge	3.295	0.861	Mg	Mg	Ge	Ti	Al	Al	Al	Ga	3.901	0.937	
Mg	Cd	Ti	Ti	Ti	Ga	In	In	2.270	0.861	Mg	Ba	Ge	Hf	Y	Y	Y	Y	2.830	0.916	Mg	Ca	Zr	Zr	Al	Al	Al	In	3.295	0.769	Be	Mg	Ti	Ti	Al	Al	Ga	Ga	3.901	0.979	
Ba	Zn	Si	Si	Ga	Ga	Ga	Sc	2.271	0.961	Be	Ca	Zn	Zn	Sn	Sn	Sn	Ti	2.830	1.053	Be	Be	Mg	Ba	Ti	Hf	Hf	Hf	3.295	0.641	Be	Be	Si	Zr	Sc	Sc	Sc	Y	3.901	0.864	
Be	Mg	Sn	Sn	Al	Al	Y	Y	2.271	0.762	Mg	Mg	Ca	Cd	Sn	Sn	Sn	Ti	2.830	1.207	Mg	Zn	Ti	Ti	Al	Al	Y	Y	3.295	1.033	Mg	Mg	Mg	Zn	Si	Zr	Hf	3.902	0.896		
Mg	Ba	Ge	Ge	Al	Al	Y	Y	2.271	0.829	Mg	Zn	Si	Si	Al	Al	In	In	2.830	1.217	Be	Be	Mg	Cd	Ti	Ti	Al	Zr	3.295	0.941	Be	Be	Si	Zr	Al	Ga	Ga	Ga	3.903	0.904	
Ca	Zn	Zn	Cd	Sn	Sn	Zr	Zr	2.271	0.949	Be	Be	Be	Ba	Ba	Sn	Zr	Hf	2.830	0.997	Sr	Zn	Si	Ti	Ti	Al	Al	Al	3.295	0.684	Ca	Sr	Sr	Ba	Si	Si	Si	Hf	3.903	0.800	
Ba	Ba	Ge	Al	Al	Al	Sc	Sc	2.271	0.747	Be	Be	Mg	Sr	Sn	Sn	Sn	Zr	2.830	1.041	Mg	Mg	Ti	Ti	Al	In	In	Sc	3.296	0.548	Be	Be	Be	Mg	Ge	Ti	Zr	Zr	3.903	0.870	
Sr	Sr	Si	Zr	In	In	In	Sc	2.272	0.936	Be	Be	Ca	Zn	Sn	Sn	Sn	Ti	2.830	1.175	Ca	Ca	Si	Hf	Al	Al	Sc	Sc	3.296	0.675	Be	Zn	Zr	Zr	Al	Al	Al	Sc	3.903	0.961	
Ca	Cd	Cd	Cd	Ge	Ge	Sn	Ti	2.272	0.954	Be	Be	Be	Cd	Ge	Zr	Zr	Hf	2.830	0.987	Cd	Cd	Ti	Zr	Al	Al	Sc	Sc	3.296	0.554	Ca	Sr	Ba	Ba	Si	Si	Si	Zr	3.903	0.856	
Mg	Ca	Zn	Zn	Ge	Sn	Sn	Sn	2.272	0.670	Cd	Cd	Ti	Ti	Al	Al	Ga	Y	2.830	1.009	Mg	Mg	Si	Zr	Al	Al	Y	Y	3.296	0.655	Mg	Mg	Ca	Zn	Si	Si	Ge	Ge	3.904	0.839	
Mg	Sr	Hf	Hf	Ga	In	In	In	2.273	1.205	Be	Be	Ba	Cd	Ge	Ge	Ge	Ti	2.830	1.167	Be	Ba	Zn	Cd	Ge	Ge	Zr	Zr	3.296	0.835	Be	Ca	Ca	Sr	Ge	Ge	Hf	Hf	3.904	0.890	
Be	Be	Ca	Cd	Sn	Sn	Sn	Hf	2.274	1.227	Ba	Ba	Ti	Zr	Al	Al	Al	Ga	2.830	0.849	Be	Be	Si	Sn	Sc	Sc	Y	Y	3.296	0.617	Mg	Sr	Sr	Si	Ge	Ge	Hf	Hf	3.904	0.748	
Zn	Cd	Ge	Zr	Ga	Ga	Ga	Ga	2.274	1.031	Mg	Ge	Hf	Hf	Al	Y	Y	Y	2.830	0.747	Be	Mg	Ca	Cd	Zr	Zr	Zr	Zr	3.297	1.055	Mg	Sr	Sr	Sr	Si	Ge	Ge	Ti	3.904	0.739	
Sr	Sr	Si	Ti	Ga	Ga	Ga	Y	2.274	1.031	Mg	Ba	Ba	Cd	Ti	Zr	Zr	Zr	2.830	0.809	Be	Mg	Mg	Sr	Si	Si	Sn	Sn	3.297	1.040	Mg	Ba	Ba	Ba	Si	Si	Ge	Zr	3.906	0.897	
Ba	Cd	Ti	Ti	Ga	Ga	Y	Y	2.274	1.187	Be	Ba	Ba	Zr	Zr	Sc	Sc	Y	2.831	0.844	Be	Be	Ba	Zn	Si	Si	Si	Hf	3.297	0.901	Be	Sr	Sr	Sr	Si	Ti	Zr	Zr	3.906	0.696	
Ba	Ba	Zn	Zn	Ge	Ge	Zr	Hf	2.274	0.982	Ca	Ba	Ba	Zn	Sn	Sn	Sn	Zr	2.831	0.722	Ca	Ba	Ba	Ba	Ge	Sn	Zr	Zr	3.297	0.558	Ca	Ca	Ca	Ca	Sn	Ti	Zr	Hf	3.906	0.717	
Zn	Zn	Sn	Hf	Al	Al	Y	Y	2.274	0.997	Zn	Zn	Zn	Zr	Zr	Al	Ga	Ga	In	2.831	0.797	Zn	Zn	Zn	Cd	Si	Si	Ge	Ti	3.297	0.723	Be	Ca	Ca	Sr	Ti	Zr	Zr	Zr	3.906	0.847
Mg	Sr	Ge	Ge	Al	Al	Al	Ga	2.274	1.179	Zn	Zn	Hf	Hf	In	In	In	Sc	2.831	0.833	Mg	Cd	Zr	Zr	In	Sc	Sc	Sc	3.297	0.714	Mg	Mg	Mg	Ca	Si	Sn	Zr	Zr	3.906	0.861	
Mg	Zn	Cd	Cd	Ge	Ge	Sn	Sn	2.274	0.973	Mg	Mg	Ba	Ba	Zn	Sn	Sn	Hf	2.831	0.816	Be	Be	Ba	Zn	Sn	Si	Si	Zr	Zr	3.297	0.677	Mg	Ca	Ca	Ba	Si	Ti	Ti	Ti	3.906	0.877
Be	Ba	Zr	Zr	In	In	In	Sc	2.274	0.907	Ba	Zn	Zn	Zn	Si	Ti	Ti	Hf	2.831	0.824	Ca	Cd	Hf	Hf	Al	Sc	Sc	Sc	3.297	0.864	Mg	Sr	Sr	Sr	Si	Ge	Ge	Zr	3.906	0.839	
Cd	Cd	Ti	Ti	Ti	Ga	In	Y	2.275	1.014	Sr	Sr	Sr	Zn	Ge	Sn	Hf	Hf	2.831	0.484	Mg	Sr	Zn	Zn	Si	Si	Zr	Zr	3.297	0.747	Mg	Mg	Sr	Sr	Si	Si	Ti	Zr	3.907	0.807	
Ba	Ba	Zn	Zn	Ge	Sn	Sn	Ti	2.275	0.928	Ca	Cd	Hf	Hf	Ga	Ga	Ga	Sc	2.831	0.400	Be	Be	Sn	Ti	Ga	Ga	Ga	In	3.297	0.616	Mg	Ba	Ba	Ba	Si	Si	Ge	Hf	3.907	0.872	
Ca	Ba	Hf	Hf	Ga	Y	Y	Y	2.275	0.874	Ba	Ba	Zn	Zn	Ge	Ti	Ti	Zr	2.831	0.403	Ca	Ca	Sr	Zn	Ge	Ge	Hf	Hf	3.297	0.864	Be	Be	Ca	Sr	Si	Si	Ti	Ti	3.907	0.740	
Ca	Ca	Si	Zr	Ga	In	In	In	2.275	1.003	Zn	Zn	Ge	Ti	Al	Al	Y	Y	2.831	0.712	Sr	Zn	Zr	Zr	Al	Sc	Sc	Sc	3.298	0.986	Be	Ca	Ca	Zn	Si	Si	Si	Hf	3.907	0.756	
Ca	Ba	Ba	Zn	Si	Sn	Sn	Sn	2.275	0.912	Ba	Ba	Zr	Hf	Al	Al	Sc	Sc	2.831	0.426	Sr	Ba	Si	Ti	Sc	Sc	Sc	Sc	3.298	0.705	Mg	Mg	Ge	Ti	Al	Sc	Sc	Sc	3.908	0.83	

Mg	Ba	Hf	Hf	In	In	In	Sc	2.290	0.286	Sr	Cd	Si	Hf	Al	Al	Al	2.840	1.132	Be	Mg	Ge	Hf	Y	Y	Y	3.305	0.466	Be	Sr	Zn	Zn	Si	Si	Si	3.939	1.217				
Sr	Sr	Si	Ti	In	In	In	Y	2.290	0.154	Ba	Ba	Sn	Ti	Sc	Y	Y	2.840	1.115	Ca	Ca	Ca	Zn	Si	Sn	Ti	3.305	0.641	Be	Sr	Zn	Zn	Si	Ti	Ti	3.940	1.458				
Sr	Ba	Ba	Cd	Ge	Sn	Zr	Zr	2.290	0.279	Sr	Sr	Sr	Zn	Si	Ge	Hf	2.840	1.117	Ca	Ca	Ca	Zn	Ge	Ge	Sn	Ti	3.305	0.617	Be	Be	Mg	Sn	Ti	Ti	Ti	3.940	0.920			
Sr	Ba	Ba	Zn	Si	Sn	Sn	Sn	2.290	0.282	Sr	Ba	Zr	Zr	Al	Al	Al	2.840	1.011	Be	Be	Sr	Cd	Si	Si	Ti	3.305	0.448	Mg	Ca	Zn	Sn	Si	Si	In	3.940	1.342				
Ba	Ba	Si	Ge	Al	Al	Al	Ga	2.290	0.151	Ba	Cd	Si	Ge	Sc	Sc	Sc	2.841	0.945	Be	Mg	Ca	Cd	Hf	Hf	Hf	3.305	0.483	Be	Ca	Zr	Hf	Al	Al	In	3.941	1.546				
Sr	Zn	Zn	Cd	Ge	Ge	Ge	Zr	2.290	0.630	Cd	Si	Si	In	Sc	Sc	Y	2.841	1.053	Be	Sr	Si	Si	Al	Al	Sc	3.305	0.586	Al	Al	Al	Ga	In	Sc	Y	3.941	0.653				
Ca	Zn	Zn	Sn	Si	Ge	Sn	Sn	2.291	0.649	Sr	Ba	Si	Si	Ge	Sc	Sc	2.841	0.964	Be	Be	Sn	Ti	Ti	Ga	Ga	Y	3.305	0.714	Al	Be	Ti	Hf	Al	Ga	Ga	3.941	0.766			
Mg	Mg	Sn	Cd	Sn	Sn	Sn	Hf	2.291	0.237	Ca	Ca	Si	Hf	Al	Al	Ga	2.841	0.793	Mg	Mg	Ge	Zr	Al	Al	Ga	3.306	0.618	Be	Mg	Mg	Ba	Si	Ti	Ti	3.941	0.764				
Zn	Zn	Si	Ti	In	In	In	Y	2.291	0.595	Zn	Zn	Ti	Ti	Al	Ga	Y	2.841	0.987	Ca	Ba	Ba	Zn	Zr	Zr	Hf	3.306	0.703	Be	Be	Mg	Zn	Si	Si	Si	3.942	1.539				
Mg	Cd	Sn	Zr	Ga	Ga	Ga	Zr	2.292	0.626	Mg	Ca	Zn	Zn	Ge	Ge	Ge	2.841	0.964	Be	Be	Ge	Hf	Sc	Y	Y	Y	3.306	0.708	Mg	Zn	Si	Zr	Sc	Sc	Sc	3.942	1.418			
Ca	Cd	Ge	Ge	Al	Al	Al	Y	2.292	0.205	Ca	Ca	Zn	Cd	Ge	Ti	Ti	2.841	0.981	Mg	Mg	Sr	Sr	Si	Si	Ge	Sn	3.306	0.536	Be	Mg	Zn	Zn	Si	Si	Ge	3.942	1.264			
Ba	Ba	Ti	Zr	In	In	Y	Y	2.292	0.586	Sr	Ba	Ba	Zn	Ge	Ge	Zr	2.842	1.118	Ca	Ca	Ba	Ba	Si	Si	Si	Ge	3.306	0.594	Mg	Ba	Ba	Zn	Si	Si	Si	3.942	1.765			
Be	Be	Ba	Cd	Sn	Sn	Sn	Ti	2.292	0.622	Ca	Zn	Cd	Cd	Si	Si	Si	2.842	0.739	Be	Be	Ti	Zr	In	In	In	Sc	3.306	0.509	Be	Be	Be	Mg	Si	Ge	Ge	Sn	3.943	1.613		
Be	Mg	Sn	Ti	In	In	In	In	2.292	0.199	Ca	Cd	Hf	Hf	Al	Al	Ga	2.842	0.784	Ca	Cd	Zr	Zr	In	Al	Al	Sc	3.306	1.092	Mg	Mg	Ca	Sr	Ge	Ti	Ti	3.943	1.346			
Ca	Sr	Hf	Hf	In	In	Y	Y	2.292	0.547	Be	Be	Ba	Ba	Ge	Sn	Sn	Ti	2.842	1.090	Sr	Sr	Sr	Ba	Ti	Ti	Zr	Hf	3.306	0.924	Be	Mg	Mg	Mg	Si	Ge	Sn	Sn	3.943	1.037	
Ca	Ca	Si	Zr	Al	In	In	In	2.292	0.518	Be	Ba	Ti	Zr	Y	Y	Y	Y	2.842	0.701	Be	Be	Be	Zr	Zr	In	Sc	Sc	Y	3.307	0.625	Be	Ca	Zn	Zn	Zr	Zr	Hf	Hf	3.944	1.203
Sr	Zn	Zn	Cd	Sn	Sn	Ti	Ti	2.292	0.113	Ba	Cd	Si	Si	Al	Al	Al	Sc	2.842	0.746	Mg	Ba	Ba	Ba	Si	Si	Ge	Sn	3.307	1.347	Be	Ca	Ca	Ba	Si	Ti	Ti	Ti	3.944	1.177	
Sr	Sr	Ge	Zr	Ga	Ga	Sc	Sc	2.293	0.543	Cd	Cd	Cd	Cd	Si	Al	Ge	Ti	2.842	1.083	Mg	Mg	Mg	Cd	Cd	Sn	Ti	Zr	Zr	3.307	1.091	Mg	Ca	Ca	Sr	Si	Si	Zr	Zr	3.944	1.045
Be	Sr	Ge	Sn	Sc	Sc	Sc	Sc	2.293	0.511	Be	Bn	Cd	Cd	Cd	Sn	Sn	Zr	2.842	0.963	Mg	Mg	Hf	Hf	Ga	In	Sc	Sc	3.307	0.662	Be	Be	Ti	Ti	Al	Al	Ga	Y	3.945	1.309	
Cd	Cd	Si	Si	Al	In	Y	Y	2.293	0.102	Ba	Cd	Cd	Ti	Ti	Al	Al	Y	2.842	0.861	Mg	Ca	Si	Si	Al	Al	Al	In	3.307	0.274	Be	Be	Ge	Ti	Sc	Sc	Sc	Y	3.945	1.256	
Sr	Sr	Zn	Zn	Cd	Ge	Ge	Sn	Hf	2.293	0.749	Be	Be	Be	Zn	Si	Ge	Sn	Sn	2.843	0.950	Be	Be	Mg	Ba	Ge	Hf	Hf	Hf	3.307	0.306	Be	Mg	Ti	Hf	Sc	Sc	Sc	Sc	3.945	1.880
Ba	Ba	Zn	Cd	Cd	Si	Si	Zr	Zr	2.293	0.745	Ba	Ba	Si	Ti	Al	Al	Ga	2.843	0.932	Zn	Zn	Si	Si	Si	Ga	Sc	Sc	Y	3.307	0.326	Be	Zn	Si	Si	Sc	Sc	Sc	Y	3.946	1.840
Zn	Cd	Ge	Ge	Al	Al	Y	Y	2.293	0.128	Be	Be	Sr	Cd	Ti	Ti	Zr	Zr	2.843	1.034	Be	Be	Mg	Ba	Ti	Zr	Zr	Zr	3.307	0.382	Mg	Mg	Ca	Zn	Sn	Ti	Ti	Ti	3.947	1.717	
Sr	Ba	Ge	Ge	Al	Al	Y	Y	2.294	0.704	Be	Be	Be	Ba	Ba	Si	Si	Sn	Hf	2.843	1.080	Sr	Cd	Ti	Ti	Zr	Al	Sc	Sc	3.307	0.385	Mg	Mg	Mg	Ca	Ge	Ge	Sn	Ti	3.947	1.156
Ba	Ba	Zn	Zn	Sn	Sn	Hf	Hf	2.294	0.717	Sr	Ba	Si	Si	Ge	Sc	Sc	Sc	2.843	0.689	Mg	Mg	Si	Zr	Ga	Y	Y	Y	3.307	0.339	Mg	Cd	Si	Ti	Sc	Sc	Sc	Sc	3.947	1.417	
Sr	Sr	Ti	Zr	Zr	Ga	In	In	2.295	0.438	Ca	Zn	Si	Sn	Sc	Al	Al	Al	2.843	0.822	Ca	Cd	Ge	Ti	Sc	Sc	Sc	Sc	3.307	1.457	Al	Ga	In	Sc	Sc	Sc	Sc	Y	3.947	1.519	
Sr	Ba	Si	Si	Ti	Ga	Ga	Ga	2.295	0.656	Be	Mg	Ba	Ba	Si	Si	Sn	Sn	2.843	1.054	Mg	Ca	Hf	Hf	Al	Al	Sc	Sc	3.307	1.357	Be	Mg	Mg	Sr	Si	Si	Sn	Sn	3.947	1.177	
Ba	Zn	Cd	Cd	Ti	Ti	Ti	Hf	2.295	0.692	Sr	Zn	Zn	Zn	Sn	Zr	Zr	Hf	2.843	0.648	Be	Be	Sr	Sr	Si	Si	Ge	Ge	Ti	3.307	1.215	Be	Mg	Ti	Ti	Sc	Sc	Sc	Y	3.948	1.516
Ca	Sr	Zn	Zn	Sn	Sn	Sn	Hf	2.295	0.401	Be	Be	Mg	Cd	Sn	Sn	Zr	Zr	2.843	0.781	Zn	Zn	Ge	Zr	Sr	Si	Al	Al	Sc	3.307	0.399	Be	Cd	Si	Si	Al	Al	Al	Sc	3.948	1.581
Ca	Sr	Cd	Cd	Si	Si	Hf	Hf	2.295	0.645	Ba	Be	Ti	Ti	Ti	Ga	Sc	Sc	Y	2.844	1.047	Be	Be	Sr	Zn	Si	Si	Si	Sn	3.308	0.552	Be	Mg	Si	Si	Ga	Sc	Sc	Sc	3.948	1.230
Ca	Zn	Hf	Hf	In	In	In	Y	2.295	0.687	Mg	Ba	Cd	Cd	Ge	Zr	Zr	Zr	2.844	0.947	Be	Zn	Hf	Hf	Ga	Sc	Sc	Sc	3.308	0.830	Be	Be	Ge	Ti	Al	Al	Al	Sc	3.948	1.589	
Ca	Ba	Zn	Zn	Sn	Sn	Sn	Zr	2.295	0.934	Sr	Zn	Ti	Ti	Ga	Ga	Sc	Sc	2.844	1.179	Ca	Zn	Zn	Si	Si	Ti	Ti	Zr	3.308	0.521	Be	Be	Si	Hf	Al	Sc	Sc	Sc	3.950	1.809	
Sr	Zn	Ti	Ti	Ga	Ga	In	In	2.295	0.594	Mg	Ca	Zr	Zr	Ga	Y	Y	2.844	1.125	Sr	Sr	Sr	Ba	Ba	Sn	Ti	Ti	Zr	3.308	0.617	Be	Be	Mg	Ca	Ge	Ge	Hf	Hf	3.950	1.226	
Ba	Ba	Si	Zr	Ga	Ga	In	In	2.296	0.574	Sr	Sr	Ba	Cd	Ge	Ge	Ge	Ti	2.844	0.691	Be	Be	Ba	Ba	Ge	Zr	Hf	Hf	3.308	0.811	Be	Mg	Mg	Cd	Si	Si	Si	Zr	3.951	1.682	
Be	Sr	Sr	Cd	Sn	Sn	Zr	Zr	2.296	0.319	Ca	Zn	Cd	Cd	Ge	Hf	Hf	Hf	2.844	0.960	Mg	Mg	Ge	Ti	Ti	Ga	Ga	Ga	3.308	0.490	Be	Be	Mg	Ba	Si	Si	Si	Zr	3.952	1.884	
Ca	Ba	Hf	Hf	Al	In	In	In	2.296	0.587	Mg	Mg	Sr	Ba	Ge	Sn	Sn	2.844	1.091	Mg	Mg	Mg	Cd	Ge	Zr	Zr	Hf	3.308	0.813	Mg	Zn	Ti	Ti	Zr	Al	Sc	Sc	Sc	3.952	0.967	
Mg	Sr	Ti	Ti	In	In	In	Sc	2.296	0.566	Sr	Ba	Hf	Hf	Al	Al	Sc	Sc	2.844	0.649	Zn	Zn	Ge	Ti	Ti	Al	Al	Y	3.308	1.215	Be	Mg	Mg	Zn	Zr	Hf	Hf	Hf	3.952	1.111	
Cd	Cd	Ge	Hf	Al	Al	Y	Y	2.296	0.305	Be	Sr	Sr	Cd	Si	Si	Si	Ge	2.844	0.918	Mg	Ca	Zr	Zr	Ti	Al	Al	Y	3.308	0.585	Be	Be	Ca	Ca	Ge	Sn	Sn	Ti	3.952	1.125	
Ca	Sr	Cd	Cd	Ge	Ge	Ti	Ti	2.296	0.792	Zn	Zn	Zn	Zn	Si	Ge	Sn	Zr	2.845	1.083	Mg	Sr	Ti	Ti	Ti	Sc	Sc	Sc	Y	3.308	0.872	Be	Sr	Sr	Sr	Si	Ge	Ge	Zr	3.953	0.837
Ca	Ca	Ge	Zr	Ga	Ga	Y	Y	2.296	0.789	Mg	Ba	Cd	Cd	Ge	Hf	Hf	Hf	2.845	0.821	Be	Be	Sr	Ba	Sn	Zr	Zr	Zr	3.308	1.209	Be	Bn	Cd	Cd	Si	Si	Si	Ti	3.953	0.777	
Sr	Sr	Ge	Zr	Al	Al	Al	In	2.296	0.325	Ca	Ca	Si	Zr	Ga	Ga	Sc	Sc	2.845	0.856	Be	Be	Ca	Zn	Ti	Ti	Ti	Hf	3.308	0.335	Mg	Ca	Ca	Ca	Ge	Sn	Hf	Hf	3.953	0.658	
Be	Be	Zn	Cd	Sn	Sn	Sn	Zr	2.297	0.684	Sr	Ba	Sn	Ti	Y	Y	Y	Y	2.845	0.983	Mg	Mg	Ba	Cd	Si	Si	Si	Hf	3.308	0.366	Mg	Mg	Ca	Sr	Si	Si	Hf	Hf	3.954	1.027	
Be	Sr	Ge	Ti	Ga	Ga	Ga	Ga	2.297	0.664	Mg	Ba	Ge	Hf	Sc	Sc	Sc	Sc	2.845	0.785	Be	Mg	Si	Si	Ga	Ga	Ga	In	3.308	0.352	Be	Be	Mg	Mg	Ge	Sn	Hf	Hf	3.954	0.938	
Be	Cd	Zr	Zr	Al	In	In	In	2.297	0.772	Be	Ba	Si	Si	Al	Y	Y	Y	2.845	0.822	Sr	Ba	Ba	Zn	Si	Si	Si	Zr	3.309	1.251	Mg	Zn	Ti	Zr	Sc	Sc	Sc	Sc	3.954	0.696	
Mg	Mg	Sn	Sn	Ga	Sc	Sc	Y	2.297	0.675	Ca	Zn	Zr	Zr	Ga	Ga	Ga	Y	2.845	0.973	Mg	Ca	Ca	Sr	Si	Si	Sn	Sn	3.309	1.106	Be	Ba	Ba	Ba	Si	Si	Ge	Zr	3.954	0.560	
Mg	Mg	Sn	Zr	In	In	In	Y	2.298	0.657	Zn	Zn	Hf	Hf	Ga	Ga	In	Sc	2.845	0.871	Mg																				

Mg	Mg	Sn	Ti	Ga	In	In	In	2.309	-0.312	Ca	Zn	Si	Si	In	Y	Y	Y	2.854	0.987	Mg	Mg	Ca	Cd	Ti	HF	HF	HF	3.319	1.005	Be	Sr	Sr	Sr	Si	Si	Ge	Ti	3.981	0.716
Sr	Sr	Ba	Cd	Sn	Sn	Zr	Zr	2.309	-0.253	Be	Sr	Sn	Ti	Sc	Sc	Sc	Sc	2.854	0.868	Be	Be	Ca	Cd	Si	Si	Si	HF	3.319	0.673	Mg	Ca	Ca	Sr	Ge	Ge	Ge	Zr	3.981	0.710
Mg	Ba	Cd	Cd	Ge	Ge	HF	HF	2.309	0.141	Be	Be	Ge	HF	In	In	In	Sc	2.854	0.936	Be	Zn	Zn	Cd	Ge	HF	HF	HF	3.319	0.864	Be	Be	Mg	Mg	Sn	Zr	HF	HF	3.982	0.836
Be	Ca	Ge	Ge	Ga	Ga	Ga	Sc	2.309	-0.016	Be	Zn	Ge	Ge	Al	Al	Ga	Sc	2.854	1.087	Mg	Zn	Ge	Ge	Al	Sc	Sc	Sc	3.319	1.026	Ca	Sr	Sr	Ba	Si	Si	Si	Ti	3.982	0.725
Zn	Zn	Sn	HF	Al	Ga	Ga	Ga	2.309	-0.071	Ba	Zn	HF	HF	Al	Al	Al	In	2.854	0.971	Sr	Sr	Ba	Ba	Sn	Sn	Ti	Zr	3.319	0.624	Mg	Ca	Ca	Sr	Si	Si	Ti	Ti	3.982	0.543
Ca	Cd	Cd	Cd	Sn	Sn	Ti	HF	2.310	0.085	Ca	Cd	Ti	Ti	Ga	Ga	Ga	Sc	2.854	0.975	Be	Be	Mg	Ba	Ge	Ge	Ge	HF	3.319	0.693	Be	Mg	Si	Si	Sc	Sc	Y	Y	3.982	1.065
Ca	Ba	HF	HF	Ga	In	In	In	2.310	-0.017	Mg	Ba	Zr	Zr	Al	Al	Al	In	2.854	1.097	Be	Be	Be	Ba	Zn	Ti	Zr	HF	3.319	0.686	Mg	Ba	Ca	Ba	Si	Si	Zr	Zr	3.982	0.892
Be	Ca	Si	Gd	Ga	Ga	Ga	Ga	2.310	0.028	Sr	Sr	Si	Si	Ga	Sc	Sc	Y	2.854	0.961	Ca	Ca	Ti	HF	Sc	Sc	Y	Y	3.319	0.907	Mg	Ca	Ca	Ba	Si	Si	Si	Ge	3.982	0.606
Ba	Ba	Zn	Cd	Si	Si	Si	HF	2.310	0.181	Be	Ba	Si	HF	Y	Y	Y	Y	2.854	0.972	Be	Zn	HF	HF	Al	Al	Ga	Ga	3.319	0.832	Be	Ca	Ca	Ca	Sn	Sn	Ti	3.983	0.314	
Cd	Cd	HF	HF	Ga	Ga	In	Y	2.311	-0.145	Ba	Ba	Ti	Zr	Al	Al	Y	Y	2.855	1.210	Mg	Mg	Mg	Zn	Ge	Sn	HF	HF	3.320	0.682	Be	Be	Si	Ge	Al	Al	Sc	Sc	3.983	0.399
Sr	Sr	Ge	Ge	Al	Sc	Sc	Y	2.311	-0.017	Mg	Ba	Ba	Cd	Ti	Ti	Ti	HF	2.855	1.194	Ca	Ca	Mg	Zn	Si	Ti	Ti	Ti	3.320	1.071	Mg	Sr	Sr	Sr	Si	Si	Ge	Zr	3.983	0.400
Sr	Cd	Cd	Cd	Ge	Ge	Ti	HF	2.311	0.200	Mg	Cd	Cd	Cd	Si	Sn	Zr	Zr	2.855	1.196	Be	Be	Be	Ca	Ge	Sn	Zr	Zr	3.320	0.963	Be	Ca	Sr	Sr	Si	Si	Ti	Ti	3.983	0.390
Mg	Zn	Cd	Cd	Sn	Sn	Sn	Zr	2.311	-0.167	Mg	Sr	Ba	Ba	Sn	Sn	Ti	Ti	2.855	1.214	Mg	Sr	Ba	Ba	Sn	Sn	Sn	Ti	3.320	0.704	Mg	Sr	Sr	Sr	Si	Si	Ge	Ti	3.983	0.508
Mg	Sr	Zr	Zr	Ga	In	In	In	2.311	-0.025	Be	Ca	Zn	Zn	Si	Si	Sn	Sn	2.855	1.157	Be	Ca	Ca	Zn	Ge	Ge	Zr	Zr	3.320	0.550	Be	Mg	Sr	Sr	Si	Si	Zr	3.983	0.471	
Cd	Cd	Si	Ge	Ga	Ga	Sc	Sc	2.311	0.105	Ba	Ba	Zn	Zn	Sn	Zr	Zr	HF	2.855	1.272	Sr	Sr	Ba	Zn	Si	Si	Si	HF	3.320	0.601	Be	Be	Si	Ti	In	Sc	Sc	Sc	3.984	1.154
Ba	Zn	Zn	Cd	Ti	Ti	Zr	Zr	2.311	0.250	Zn	Zn	Si	HF	Al	Ga	Ga	Sc	2.855	1.135	Mg	Mg	Ge	Zr	Al	Al	Al	Y	3.320	0.554	Be	Ca	Ca	Sr	Ti	Ti	HF	3.984	1.084	
Cd	Cd	HF	HF	Al	In	In	Sc	2.311	0.310	Mg	Sr	Zr	Zr	Al	Y	Y	Y	2.855	0.994	Be	Sr	Si	Si	Sc	Sc	Y	Y	3.320	0.629	Mg	Mg	Sr	Ba	Si	Si	Si	Ti	3.985	0.969
Sr	Ba	Zr	Zr	In	In	In	Sc	2.311	0.187	Be	Be	Sn	Zr	Al	Al	In	In	2.855	1.206	Be	Zn	Zn	Zn	Ge	Sn	Ti	Zr	3.320	0.690	Be	Mg	Mg	Sr	Ge	Ti	Ti	Ti	3.987	0.412
Be	Ca	Cd	Cd	Si	Si	Sn	Sn	2.311	0.144	Mg	Mg	Si	Si	Ga	Ga	In	Y	2.855	1.132	Be	Zn	Ge	Ge	Sc	Sc	Y	Y	3.320	0.588	Ca	Ca	Ca	Ca	Si	Sn	Ti	Zr	3.988	0.579
Be	Zn	Si	Zr	In	In	In	In	2.312	0.271	Sr	Zn	Zr	Zr	Ga	Y	Y	Y	2.855	1.194	Be	Mg	Mg	Cd	Ge	Ge	Zr	Zr	3.320	1.084	Be	Zn	Zn	Zn	Si	Si	Ge	Ti	3.988	0.734
Ca	Ba	HF	HF	In	In	In	Sc	2.312	0.204	Sr	Sr	Si	Si	Al	Sc	Sc	Y	2.855	1.346	Sr	Zn	Si	Si	Al	Sc	Sc	Sc	3.321	1.036	Be	Mg	Ti	Ti	Al	Al	Ga	Ga	3.988	0.505
Ca	Ca	Sn	Zr	Al	Al	Ga	Ga	2.312	0.124	Ca	Ba	Ti	Ti	Al	Al	Al	Y	2.856	0.865	Be	Be	Be	Ca	Sn	Sn	Ti	Zr	3.321	0.917	Be	Be	Si	Ge	Al	Al	In	3.989	0.684	
Sr	Sr	Si	Zr	Ga	Ga	Ga	In	2.312	0.263	Mg	Ba	Ba	Cd	Ti	Ti	Ti	Zr	2.856	0.986	Be	Be	Be	Ba	Sn	Sn	Ti	Zr	3.321	0.557	Mg	Ca	Ca	Ca	Si	Sn	Sn	Zr	3.989	0.789
Sr	Sr	Ba	Zn	Si	Sn	Sn	Sn	2.312	0.060	Ca	Zn	Zn	Zn	Si	Si	Ge	Sn	2.856	1.317	Mg	Zn	Zn	Cd	Ge	Zr	Zr	Zr	3.321	0.627	Be	Be	Mg	Sr	Si	Si	Ti	Ti	3.989	0.496
Sr	Sr	Zr	Zr	Ga	In	In	Y	2.312	-0.070	Ca	Sr	Ba	Cd	Ti	Ti	Ti	Ti	2.856	0.819	Mg	Sr	Zr	HF	Al	Al	Al	Sc	3.321	0.715	Be	Be	Mg	Ca	Sn	Ti	Ti	Ti	3.989	0.790
Sr	Cd	Cd	Si	Ge	Ge	Ti	Ti	2.312	-0.108	Ba	Zn	Ti	Ti	Ga	Y	Y	Y	2.856	0.945	Cd	Cd	Si	Zr	Al	Al	Sc	Sc	3.321	0.651	Be	Be	Mg	Ca	Ge	Zr	Zr	Zr	3.989	1.053
Ba	Ba	Si	HF	Al	Ga	Ga	Ga	2.313	0.082	Ca	Sr	Cd	Cd	Ti	Zr	Zr	Zr	2.856	1.309	Ca	Sr	Si	Si	Sc	Sc	Sc	Y	3.321	0.699	Be	Mg	Mg	Zn	Sn	Ti	Ti	Ti	3.990	0.564
Ca	Cd	Ge	Ge	Al	Al	Ga	Ga	2.313	-0.077	Sr	Zn	Cd	Cd	Si	Si	Si	Ti	2.856	1.121	Mg	Mg	Mg	Cd	Si	Ge	Ge	Y	3.321	0.723	Be	Mg	Mg	Ba	Si	Si	HF	HF	3.991	0.889
Sr	Cd	HF	HF	Ga	Ga	Y	Y	2.313	-0.118	Be	Be	Ca	Sr	Sn	Sn	Sn	Zr	2.856	1.041	Mg	Mg	Ge	HF	Al	Al	Sc	Sc	3.321	0.632	Be	Be	Mg	Ca	Ge	Ge	Ge	Ti	3.992	1.122
Mg	Sr	Sr	HF	Ge	Ge	Ge	Sn	2.313	0.080	Ba	Ba	Sn	Ti	Sc	Sc	Sc	Sc	2.856	1.141	Be	Be	Ca	Ba	Ti	HF	HF	HF	3.321	0.819	Ca	Ca	Ca	Ca	Ge	Ti	Zr	HF	3.993	0.357
Mg	Sr	Ge	Ge	Ga	Sc	Sc	Sc	2.313	0.059	Ca	Cd	Sn	Ti	Y	Y	Y	Y	2.856	1.085	Ca	Zn	HF	HF	Ga	Sc	Sc	Sc	3.322	1.017	Mg	Mg	Sr	Zn	Si	Si	Si	Ge	3.993	0.437
Be	Sr	Sr	Cd	Sn	Sn	Sn	Ti	2.313	0.049	Mg	Ba	Ti	Ti	In	Sc	Sc	Sc	2.856	1.223	Be	Cd	Si	Si	In	Sc	Sc	Sc	3.322	0.698	Be	Be	Si	Ge	Al	Sc	Sc	Sc	3.994	0.444
Zn	Zn	Si	Zr	Ga	Ga	In	In	2.313	-0.507	Ca	Ca	Cd	Cd	Ge	Ge	Ge	Zr	2.856	1.277	Ca	Ca	Ti	Ti	Al	Sc	Y	Y	3.322	0.884	Be	Be	Ca	Ca	Ge	Ge	HF	HF	3.994	1.203
Be	Cd	Sr	Zr	In	In	Y	Y	2.314	-0.603	Ca	Zn	Cd	Cd	Ti	Ti	Zr	Zr	2.856	0.800	Be	Ca	Cd	Cd	Ti	Ti	Ti	Y	3.322	1.038	Mg	Mg	Ca	Ca	Ge	Ge	Sn	Ti	3.994	1.078
Ca	Sr	Zn	Zn	Sn	Sn	HF	HF	2.314	-0.602	Be	Be	Ba	Ba	Ge	Ge	Sn	HF	2.857	0.999	Be	Mg	Mg	Sr	Sn	Sn	Sn	Ti	3.322	0.657	Be	Be	Ca	Zn	Si	Si	Si	Ge	3.994	0.894
Sr	Sr	Si	HF	Ga	Ga	Ga	Sc	2.314	-0.342	Mg	Mg	Ba	Zn	Sn	Sn	Sn	Zr	2.857	1.250	Be	Ca	Sr	Zr	Sn	Al	Al	Sc	3.322	0.728	Mg	Ca	Ba	Ba	Si	Si	Si	Ti	3.994	1.427
Mg	Cd	Sn	Sn	Sc	Sc	Y	Y	2.314	-0.620	Sr	Sr	Zn	Cd	Zr	Zr	Zr	HF	2.857	0.752	Ca	Ba	Ba	Ge	Si	Sn	HF	HF	3.322	0.722	Mg	Mg	Ca	Ba	Si	Si	Si	Zr	3.995	1.249
Sr	Sr	Si	Si	Ga	In	Y	Y	2.314	-0.692	Be	Cd	Si	Si	Ga	Y	Y	Y	2.857	0.957	Mg	Mg	Si	Ge	Al	Al	Ga	Ga	3.322	1.382	Be	Be	Ti	HF	Al	Al	Al	Y	3.996	0.966
Ca	Sr	Si	Si	In	In	Sc	Sc	2.314	-0.243	Zn	Zn	Ti	HF	Al	Al	Y	Y	2.857	1.243	Be	Be	Si	Si	In	Sc	Y	Y	3.323	1.221	Be	Be	Ge	HF	Al	Al	Al	Sc	3.996	0.615
Ca	Ba	Zr	Zr	In	In	Y	Y	2.315	-0.534	Be	Be	Ba	Ba	Si	Si	Sn	Zr	2.857	1.088	Ca	Ba	Ba	Zn	Zr	Zr	Zr	HF	3.323	0.955	Be	Be	Mg	Zn	Ti	Ti	Ti	Zr	3.996	0.737
Mg	Sr	Si	Si	In	In	Sc	Sc	2.315	-0.628	Mg	Mg	Sn	Zr	Ga	Ga	Ga	Sc	2.857	1.326	Mg	Mg	Sn	Zr	Sc	Sc	Sc	Y	3.323	1.613	Be	Be	Si	Zr	Al	Al	Ga	Ga	3.997	0.754
Mg	Ca	Si	Si	In	In	Y	Y	2.315	-0.020	Sr	Sr	Si	Zr	In	Sc	Sc	Sc	2.857	1.273	Mg	Sr	Sr	Sr	Si	Ge	Ge	Sn	3.323	1.383	Be	Zn	Si	Si	Al	Sc	Sc	Sc	3.997	0.646
Sr	Sr	Zr	HF	Ga	In	In	In	2.316	-0.553	Be	Sr	Cd	Cd	Ge	Ge	Ge	Ti	2.858	0.792	Ca	Zn	HF	HF	Sc	Y	Y	Y	3.323	0.996	Be	Ca	Ca	Ba	Ge	Ge	Zr	3.997	0.827	
Ca	Sr	Zn	Zn	Sn	Sn	Sn	Zr	2.316	-0.653	Be	Be	Ca	Cd	Si	HF	HF	HF	2.858	1.095	Be	Ge	HF	HF	Ga	Ga	Sc	Sc	3.323	0.605	Be	Mg	Si	HF	Sc	Sc	Sc	Sc	3.998	0.823
Ba	Ba	Zn	Zn	Si	Si	Sn	HF	2.316	0.016	Sr	Sr	Ge	Zr	Al	Y	Y	Y	2.858	1.237	Be	Mg	Zr	Zr	Zr	Sc	Y	Y	3.323	0.679	Be	Be	Mg	Cd	Si	Si	Si	Ti	3.998	1.535
Sr	Sr	Zn	Zn</																																				

Ca	Ca	Cd	Cd	Si	Si	Sn	Ti	2.328	0.440	Mg	Cd	Ge	Sn	Sc	Sc	Sc	2.865	0.923	Be	Be	Mg	Ba	Ge	Zr	Zr	3.331	0.890	Ca	Ca	Ca	Si	Ti	Zr	Hf	4.030	0.528			
Be	Mg	Sr	Zn	Sn	Sn	Sn	Sn	2.328	0.412	Zn	Zn	Si	Hf	Al	Al	Y	2.866	0.696	Mg	Cd	Cd	Cd	Si	Si	Zr	Hf	3.332	1.093	Be	Mg	Ti	Ti	Al	Al	Sc	4.030	0.619		
Sr	Zn	Hf	Hf	Ga	Ga	In	In	2.328	0.395	Ca	Ca	Ti	Hf	Ga	Ga	Sc	2.866	0.681	Be	Be	Zn	Zn	Sn	Ti	Zr	Zr	3.332	0.687	Be	Mg	Ca	Ca	Si	Ge	Ge	4.030	0.627		
Mg	Mg	Si	Ge	Ga	Ga	In	In	2.328	0.648	Ca	Cd	Hf	Hf	Ga	Y	Y	2.866	0.685	Ca	Cd	Zr	Zr	Sc	Sc	Sc	Y	3.332	0.952	Be	Be	Si	Zr	Al	Sc	Sc	4.030	0.880		
Sr	Cd	Ge	Sn	Sc	Sc	Sc	Sc	2.328	0.558	Mg	Ca	Cd	Cd	Ge	Ge	Ge	2.866	0.426	Be	Be	Mg	Ca	Sn	Sn	Sn	Ti	3.332	1.119	Be	Ca	Zr	Sr	Ge	Ge	Ti	4.030	0.864		
Ca	Ba	Zr	Zr	Ga	Y	Y	Y	2.328	0.534	Cd	Cd	Si	Ge	Sc	Y	Y	2.866	0.570	Ba	Ba	Ba	Ba	Si	Ge	Zr	Hf	3.332	0.651	Mg	Ca	Sr	Zn	Si	Si	Si	4.031	0.771		
Be	Ca	Si	Si	Al	In	In	Sc	2.328	0.724	Ca	Ca	Si	Zr	Al	Al	Y	2.866	0.739	Be	Ba	Ba	Zn	Si	Si	Si	Zr	3.332	0.744	Be	Mg	Mg	Ca	Sn	Zr	Hf	4.032	1.007		
Mg	Mg	Sn	Sn	Al	Al	Sc	Y	2.329	0.503	Ca	Ca	Si	Si	Ga	Ga	Y	2.866	0.249	Be	Be	Ba	Ca	Ge	Zr	Hf	Hf	3.332	0.745	Be	Be	Mg	Mg	Ge	Zr	Hf	4.032	0.970		
Zn	Zn	Si	Sn	Al	Al	Ga	Ga	2.329	0.415	Zn	Zn	Si	Zr	Ga	Ga	Y	2.866	0.221	Mg	Mg	Zn	Cd	Si	Si	Si	Sn	3.332	1.003	Mg	Ca	Ca	Sr	Ge	Ge	Ge	4.032	0.766		
Ca	Zn	Sn	Sn	Al	Sc	Sc	Sc	2.329	0.659	Be	Be	Sr	Zn	Ge	Ge	Sn	2.866	0.231	Mg	Mg	Zn	Cd	Ti	Zr	Zr	Hf	3.332	0.911	Be	Be	Mg	Mg	Sn	Zr	Zr	4.033	0.682		
Cd	Cd	Ti	Ti	Ga	In	In	Sc	2.329	0.477	Ca	Ca	Ge	Ti	Al	Al	Y	2.866	0.604	Be	Be	Ca	Cd	Zr	Hf	Hf	Hf	3.332	0.768	Mg	Mg	Mg	Zn	Si	Ge	Ti	4.035	0.733		
Ca	Cd	Cd	Cd	Sn	Sn	Ti	Zr	2.329	0.499	Mg	Mg	Hf	Hf	Al	In	Y	2.866	0.741	Zn	Zn	Zn	Zn	Si	Ge	Zr	Hf	3.333	1.159	Mg	Mg	Zr	Hf	Al	Al	Al	4.035	0.676		
Ba	Ba	Sn	Hf	Sc	Sc	Sc	Y	2.329	0.677	Ca	Cd	Si	Si	Al	Al	Y	2.866	0.912	Be	Ca	Ca	Cd	Zr	Hf	Hf	Hf	3.333	1.042	Be	Be	Si	Ti	Ga	Ga	Sc	4.036	0.699		
Be	Be	Ge	Ge	Ga	In	Y	Y	2.329	0.306	Cd	Cd	Si	Zr	Ga	Y	Y	2.867	0.438	Ca	Ca	Sr	Zn	Ti	Ti	Zr	Zr	3.333	0.797	Mg	Mg	Ca	Ca	Sn	Sn	Ti	4.036	0.779		
Ba	Zn	Zn	Cd	Si	Si	Zr	Zr	2.329	0.423	Mg	Mg	Sr	Zn	Si	Si	Sn	2.867	0.395	Sr	Ba	Ba	Ba	Ge	Ge	Zr	Hf	3.333	0.594	Mg	Mg	Mg	Zn	Si	Si	Ti	Hf	4.036	0.692	
Sr	Zn	Zr	Zr	In	In	In	Sc	2.329	0.682	Ca	Zn	Sn	Al	Al	Al	Al	2.867	0.401	Mg	Sr	Ti	Ti	Sc	Sc	Y	Y	3.334	0.686	Mg	Sr	Ba	Ba	Si	Si	Hi	4.036	0.984		
Ca	Ca	Si	Sn	Al	Al	Al	Sc	2.329	0.276	Zn	Zn	Sn	Ti	Al	Y	Y	2.867	0.539	Be	Be	Si	Zr	Al	Y	Y	Y	3.334	0.647	Be	Mg	Mg	Mg	Ge	Sn	Zr	4.037	0.950		
Mg	Zn	Si	Sn	Al	In	In	In	2.330	0.409	Mg	Mg	Zr	Zr	In	In	In	2.867	0.683	Ca	Cd	Si	Zr	Y	Y	Y	Y	3.334	0.645	Mg	Sr	Ba	Ba	Si	Si	Zr	4.037	0.832		
Ca	Zn	Hf	Hf	In	In	In	Y	2.330	0.784	Cd	Cd	Zr	Zr	Ga	Sc	Y	2.867	0.842	Ba	Ba	Si	Ti	Sc	Sc	Y	Y	3.334	0.770	Be	Mg	Hf	Hf	Al	Al	Al	Sc	4.037	0.664	
Sr	Ba	Zr	Zr	Ga	In	In	In	2.330	0.649	Ca	Ba	Ba	Cd	Zr	Zr	Hf	Hf	2.867	0.339	Mg	Mg	Ti	Ti	In	Sc	Y	Y	3.334	0.687	Mg	Zn	Zr	Hf	Al	Al	Al	Al	4.037	0.683
Be	Sr	Ge	Ge	Al	Al	Al	Ga	2.330	0.597	Cd	Cd	Ge	Hf	Sc	Y	Y	2.867	0.295	Mg	Ca	Zr	Zr	Sc	Sc	Y	Y	3.334	1.167	Mg	Mg	Mg	Ca	Ge	Zr	Hf	4.037	0.714		
Sr	Ba	Ti	Ti	In	In	Y	Y	2.330	0.715	Ca	Ba	Ti	Ti	Al	Al	In	2.868	0.302	Mg	Ba	Cd	Zn	Ge	Hf	Hf	Hf	3.334	1.128	Mg	Mg	Ca	Ba	Si	Si	Ge	4.038	0.702		
Sr	Sr	Sn	Ti	Al	Al	Al	Ga	2.330	0.638	Ca	Ca	Ge	Hf	Ga	Sc	Sc	2.868	0.714	Be	Cd	Cd	Cd	Ge	Ge	Ti	Hi	3.334	1.017	Be	Be	Ti	Zr	Al	Al	Ga	4.038	0.723		
Ba	Cd	Ti	Ti	In	In	Sc	Sc	2.330	0.720	Zn	Zn	Si	Si	Al	Al	In	2.868	0.851	Ca	Zn	Si	Hf	Al	Al	Al	Al	3.334	0.595	Be	Mg	Mg	Zn	Si	Si	Si	Sn	4.038	0.718	
Mg	Ba	Ba	Cd	Sn	Sn	Sn	Hf	2.330	0.721	Mg	Sr	Zr	Zr	In	Sc	Sc	2.868	1.012	Mg	Zn	Sn	Hf	Sc	Sc	Sc	Sc	3.334	0.726	Mg	Mg	Ca	Ca	Sn	Zr	Hf	Hf	4.038	0.669	
Cd	Cd	Ge	Sn	Sc	Y	Y	Y	2.330	0.452	Ba	Ba	Ba	Zn	Ge	Sn	Hf	2.868	0.526	Ca	Ca	Sr	Zn	Si	Zr	Zr	Zr	3.334	0.816	Be	Be	Si	Si	Al	Sc	Sc	Y	4.039	0.780	
Ca	Ba	Ba	Cd	Ge	Ge	Ge	Sn	2.330	0.657	Be	Ca	Ba	Ba	Ge	Ge	Sn	2.868	0.468	Be	Zn	Zr	Zr	Ga	Ga	Y	Y	3.334	0.662	Be	Be	Ca	Ca	Ge	Ge	Ti	Zr	4.039	0.927	
Mg	Mg	Sn	Hf	Ga	Ga	In	In	2.330	0.724	Cd	Cd	Si	Ge	Sc	Sc	Y	2.868	0.472	Be	Sr	Zn	Zn	Ti	Zr	Zr	Zr	3.334	0.794	Mg	Mg	Ca	Ca	Sn	Sn	Hf	Hf	4.040	0.685	
Sr	Sr	Ge	Ti	Al	Al	Ga	Ga	2.330	0.419	Mg	Sr	Sr	Cd	Ge	Ge	Ge	2.868	0.304	Be	Sr	Zn	Cd	Ti	Ti	Ti	Ti	3.334	0.829	Mg	Ca	Ba	Ba	Si	Si	Ti	4.041	0.817		
Ba	Cd	Ti	Ti	Ti	Ga	Ga	Y	2.330	0.645	Sr	Ba	Zr	Zr	Al	Al	Ga	2.868	0.439	Zn	Zn	Si	Ge	Sc	Sc	Y	Y	3.335	0.673	Be	Sr	Sr	Sr	Si	Si	Ti	Hf	4.041	0.944	
Ca	Zn	Ti	Ti	Ga	In	In	In	2.331	0.745	Mg	Mg	Cd	Cd	Si	Si	Ge	Sn	2.868	0.714	Be	Be	Mg	Zn	Si	Hi	Hi	Hi	3.335	0.909	Be	Mg	Mg	Sr	Si	Ti	Ti	Ti	4.041	0.621
Ba	Cd	Si	Si	Al	Al	Al	Ga	2.331	0.886	Sr	Sr	Ti	Zr	Ga	Y	Y	2.868	0.404	Sr	Ba	Ba	Ba	Si	Ge	Hf	Hf	3.335	1.103	Be	Zn	Si	Al	Al	Al	Ga	4.041	0.701		
Mg	Zn	Zn	Cd	Sn	Sn	Sn	Hf	2.331	0.982	Be	Ba	Cd	Cd	Ge	Hf	Hi	Hi	2.868	0.459	Mg	Ca	Ti	Ti	Al	Al	Ga	Ga	3.335	0.710	Be	Ca	Ca	Sr	Ge	Ge	Hi	4.043	0.708	
Zn	Zn	Ge	Ge	Sn	Al	In	Sc	2.331	0.739	Ba	Ba	Cd	Si	In	Sc	Sc	2.868	0.474	Ca	Ca	Sr	Sr	Ge	Sn	Hf	Hf	3.335	0.970	Be	Ca	Ca	Ca	Sn	Sn	Ti	Zr	4.043	0.887	
Ba	Ba	Cd	Cd	Ti	Ti	Zr	Hf	2.331	0.722	Sr	Sr	Sr	Cd	Si	Si	Ti	2.868	0.648	Mg	Mg	Sr	Cd	Ge	Ge	Ti	Ti	3.335	1.130	Be	Be	Mg	Zn	Si	Si	Zr	4.043	0.877		
Ba	Ba	Zn	Zr	Zr	Ga	Ga	Y	2.331	0.925	Sr	Sr	Ti	Hf	Al	Al	Ga	2.868	0.789	Be	Be	Ca	Sr	Zr	Zr	Hf	Hf	3.335	0.682	Be	Ca	Ca	Sr	Ge	Ge	Ge	Zr	4.043	0.788	
Sr	Cd	Cd	Cd	Ge	Ge	Ti	Zr	2.332	0.741	Zn	Cd	Cd	Cd	Ge	Sn	Ti	2.868	0.960	Be	Sr	Ti	Zn	Ti	Hi	Hi	Hi	3.335	0.777	Be	Mg	Ca	Ca	Sn	Zr	Zr	Zr	4.043	1.008	
Be	Ca	Zr	Hf	In	In	In	In	2.332	0.691	Ba	Ba	Ba	Zn	Ge	Zr	Hf	2.869	0.468	Mg	Mg	Ti	Zn	Al	Al	Y	Y	3.335	0.779	Be	Cd	Si	Ti	Ti	Al	Al	Al	4.044	0.978	
Be	Ba	Zr	Zr	Ga	Ga	In	In	2.332	0.913	Mg	Sr	Cd	Cd	Sn	Zr	Zr	2.869	0.414	Zn	Zn	Ge	Al	Sc	Sc	Sc	Sc	3.335	1.098	Be	Sr	Sr	Sr	Si	Si	Ge	Zr	4.046	0.709	
Be	Be	Cd	Cd	Ge	Sn	Sn	Hf	2.333	0.591	Be	Ba	Ba	Zn	Sn	Sn	Ti	2.869	0.419	Be	Be	Mg	Sr	Sn	Zr	Zr	Zr	3.335	0.959	Be	Ca	Ca	Ca	Sn	Sn	Ti	Hi	4.047	0.777	
Mg	Ca	Ca	Cd	Ge	In	Sn	Sc	2.333	0.490	Ca	Ca	Ba	Cd	Ge	Ge	Ti	2.869	0.788	Be	Be	Si	Si	Ga	In	In	Sc	3.335	0.763	Be	Zn	Zn	Zn	Si	Si	Ti	Zr	4.047	0.755	
Ba	Ba	Ti	Hf	In	In	Sc	Sc	2.333	0.489	Ca	Ca	Cd	Cd	Ti	Zr	Hf	Hf	2.869	0.922	Mg	Ca	Ba	Ba	Sn	Sn	Hf	Hf	3.336	1.281	Be	Mg	Ti	Ti	Al	Al	Al	In	4.048	0.696
Ca	Sr	Sr	Cd	Sn	Sn	Hf	Hf	2.333	0.598	Mg	Mg	Zn	Zr	Zr	Ga	Y	Y	2.869	1.096	Zn	Zn	Si	Ti	Al	Y	Y	Y	3.336	1.109	Be	Zn	Zn	Cd	Si	Si	Ti	4.049	0.721	
Ba	Zn	Ge	Ge	Ga	Sc	Sc	Sc	2.333	0.473	Mg	Ca	Cd	Cd	Si	Si	Hi	Hf	2.869	0.622	Mg	Ca	Ca	Zn	Ge	Ge	Hf	Hf	3.336	0.795	Be	Mg	Mg	Zn	Ge	Ti	Ti	Ti	4.050	0.796
Sr	Sr	Sr	Cd	Si	Sn	Zr	Zr	2.333	0.475	Be	Zn	Hf	Hf	Al	Al	Y	Y	2.869	0.560	Ca	Ca	Ca	Zn	Ge	Sn	Ti	Ti	3.336	0.479	Be	Be	Mg	Mg	Si	Sn	Zr	4.050	0.709	
Mg	Mg	Ge	Hf	Ga	In	In	In	2.333	0.580	Be	Cd	Cd	Cd	Ge	Ge	Sn	Ti	2.870	0.562	Be	Be	Mg	Hf	In	Sc	Sc	Sc	3.336	0.603	Be	Be	Be	Mg	Si	Si	Sn	Ti	4.050	0.981
Mg	Cd	Ti	Ti	In	In	In	In	2.334	0.564	Be	Mg	Si	Si	Al	In	In																							

Ca	Sr	Ba	Zn	Sn	Sn	Sn	Sn	2.344	0.205	Sr	Sr	Hf	Hf	Al	Sc	Y	Y	2.878	1.037	Be	Be	Be	Zn	Si	Ge	Ge	Zr	3.344	0.704	Mg	Ca	Ca	Ca	Sn	Ti	Hf	Hf	4.089	1.607	
Be	Be	Be	Cd	Ge	Sn	Sn	Zr	2.344	0.530	Be	Be	Si	Hf	Ga	Ga	Y	Y	2.878	1.214	Zn	Cd	Ti	Ti	Al	Al	Al	Ga	3.344	0.972	Mg	Mg	Ca	Zn	Si	Si	Ti	Ti	4.089	0.737	
Ca	Zn	Si	Si	Si	Ga	Ga	Ga	2.344	0.530	Ca	Sr	Cd	Cd	Ti	Hf	Hf	Hf	2.878	0.882	Be	Be	Sn	Hf	Al	Al	Al	Sc	3.344	1.160	Mg	Mg	Mg	Ca	Si	Si	Ge	Ge	Zr	4.089	0.853
Sr	Sr	Sn	Zn	In	Sc	Sc	Sc	2.345	0.583	Ca	Ca	Si	Hf	In	Y	Y	Y	2.878	0.799	Be	Zn	Si	Si	Al	Y	Y	Y	3.344	0.714	Be	Mg	Mg	Ca	Sn	Sn	Ti	Ti	4.090	0.854	
Sr	Sr	Zn	Zn	Ge	Sn	Sn	Ti	2.345	0.711	Be	Be	Be	Cd	Sn	Ti	Zr	Zr	2.878	0.793	Be	Be	Mg	Ba	Ge	Ge	Ge	Zr	3.344	1.025	Mg	Mg	Ca	Sr	Si	Si	Si	Zr	4.090	1.589	
Ca	Cd	Cd	Cd	Si	Sn	Sn	Zr	2.345	0.475	Mg	Zn	Ba	Ge	Al	Y	Y	Y	2.879	0.899	Be	Sr	Ba	Ba	Si	Si	Si	Sn	3.344	1.178	Be	Sr	Ba	Ba	Si	Si	Si	Zr	4.091	1.476	
Mg	Ca	Ti	Hf	In	In	In	In	2.345	0.549	Sr	Ba	Ba	Cd	Si	Si	Si	Hf	2.879	0.965	Ca	Sr	Ba	Cd	Sn	Sn	Sn	Hf	3.345	0.693	Mg	Mg	Ca	Ca	Sn	Ti	Hf	Hf	4.092	1.344	
Ba	Zn	Zn	Zn	Sn	Sn	Sn	Ti	2.345	0.739	Zn	Zn	Ba	Al	Al	Sc	Sc	Y	2.879	1.142	Mg	Sr	Ba	Ba	Sn	Sn	Ge	Ti	3.345	0.810	Mg	Mg	Ti	Zr	Al	Al	Al	Sc	4.092	1.811	
Be	Sr	Hf	Hf	In	In	In	Sc	2.346	0.463	Mg	Cd	Si	Ti	Ga	Ga	Ga	2.879	0.846	Be	Mg	Sr	Zn	Ge	Ge	Ge	Ge	3.345	0.811	Mg	Ca	Ca	Ca	Sn	Zr	Zr	Hf	4.092	1.668		
Sr	Sr	Cd	Cd	Si	Ti	Hf	Hf	2.346	0.542	Ca	Sr	Hf	Hf	Al	Y	Y	Y	2.879	0.783	Sr	Sr	Sr	Sr	Sn	Ti	Zr	Hf	3.345	0.876	Mg	Ca	Ca	Zn	Si	Si	Si	Ti	4.093	1.419	
Sr	Zn	Zn	Zn	Ge	Sn	Sn	Ti	2.346	0.687	Ba	Ba	Ti	Hf	Ga	Sc	Sc	3.345	0.780	Mg	Mg	Mg	Ba	Si	Si	Sn	Hf	3.345	0.810	Be	Be	Mg	Mg	Sn	Ti	Hf	Hf	4.093	1.123		
Sr	Sr	Si	Ti	Ga	Ga	Ga	In	2.346	0.512	Mg	Ba	Si	Si	Al	Al	Al	Y	2.879	0.966	Ba	Ba	Si	Ti	Sc	Y	Y	Y	3.345	0.647	Be	Mg	Zr	Zr	Al	Al	Al	Ga	4.093	1.289	
Mg	Sr	Ge	Ge	Al	Al	Y	Y	2.346	0.437	Mg	Ca	Al	Y	Y	Y	Y	Y	2.879	0.876	Be	Be	Ca	Sr	Zr	Hf	Hf	Hf	3.345	1.026	Mg	Mg	Ca	Ca	Si	Ge	Ge	Hf	4.093	1.263	
Zn	Cd	Ge	Ti	Ga	Ga	Ga	Sc	2.346	0.719	Sr	Cd	Si	Ge	Y	Y	Y	Y	2.880	0.915	Be	Be	Sr	Ba	Si	Hf	Hf	Hf	3.345	0.938	Be	Zn	Ge	Ti	Al	Al	Al	Ga	4.093	1.125	
Be	Cd	Si	Si	In	In	In	Sc	2.346	0.514	Ca	Sr	Zn	Zn	Ge	Ge	Ge	Ti	2.880	0.863	Be	Be	Sn	Hf	Ga	Ga	Ga	Sc	3.345	0.641	Be	Sr	Sr	Ba	Si	Si	Si	Ti	4.094	1.392	
Ba	Cd	Cd	Cd	Si	Si	Ti	Zr	2.346	0.430	Mg	Sr	Sr	Cd	Ge	Ge	Ge	Zr	2.880	0.747	Be	Ca	Ba	Ba	Sn	Sn	Sn	Zr	3.345	0.513	Be	Ca	Ca	Ba	Si	Si	Ti	Ti	4.095	1.345	
Mg	Sr	Zr	Zr	Al	In	In	In	2.346	0.734	Cd	Cd	Ti	Zr	Ga	Ga	Sc	Sc	2.880	0.730	Ca	Ba	Zn	Zn	Ti	Ti	Hf	Hf	3.345	0.561	Be	Mg	Ti	Ti	Al	Al	Al	Y	4.095	1.923	
Sr	Ba	Cd	Cd	Si	Si	Si	Zr	2.347	0.710	Zn	Zn	Zn	Cd	Si	Si	Sn	Ti	2.880	1.080	Ca	Ca	Ba	Ba	Sn	Sn	Ti	3.345	0.479	Be	Mg	Ca	Ca	Zr	Hf	Hf	Hf	4.095	1.886		
Cd	Cd	Si	Hf	Al	Ga	Ga	Ga	2.347	0.696	Mg	Ca	Ti	Ti	Ga	Ga	Y	Y	2.880	0.976	Mg	Cd	Cd	Cd	Sn	Ti	Zr	Zr	3.345	0.589	Be	Be	Mg	Ca	Ca	Si	Si	Ti	4.096	1.768	
Ca	Ca	Si	Ti	Al	In	In	In	2.347	0.894	Be	Zn	Sn	Ba	Al	Al	Al	Sc	2.880	0.989	Be	Be	Hf	Hf	Al	In	In	Sc	3.346	0.640	Be	Mg	Ca	Ca	Sn	Sn	Ti	Ti	4.096	1.239	
Zn	Zn	Ti	Hf	In	In	In	Y	2.348	0.809	Ba	Ba	Ba	Ba	Zn	Si	Sn	Ti	2.881	0.933	Be	Be	Sr	Sr	In	Ti	Zr	Hf	3.346	0.481	Be	Mg	Mg	Sr	Si	Si	Zr	Zr	4.096	1.494	
Be	Ca	Zn	Zn	Sn	Sn	Sn	Sn	2.348	0.781	Ca	Cd	Cd	Cd	Ge	Ti	Ti	Zr	2.881	0.788	Ca	Ca	Ca	Zn	Si	Ge	Ge	Hf	3.346	1.018	Be	Be	Ti	Zr	Al	Al	Al	In	4.097	1.585	
Ca	Sr	Zr	Zr	In	In	Y	Y	2.348	0.955	Be	Ba	Zr	Zr	Al	Y	Y	Y	2.881	0.767	Be	Be	Sr	Sr	Sn	Zr	Hf	3.346	0.978	Be	Ca	Ca	Ca	Sn	Zr	Zr	Hf	4.099	1.254		
Ba	Zn	Zn	Zn	Ge	Sn	Zr	Zr	2.348	0.751	Be	Ba	Zr	Zr	Al	Sc	Sc	Sc	2.881	1.260	Be	Ca	Ba	Ba	Si	Si	Ge	Ge	3.346	0.836	Be	Zn	Si	Ti	Sc	Sc	Sc	Sc	4.099	1.592	
Zn	Zn	Sn	Zr	Al	Al	Y	Y	2.348	0.659	Mg	Mg	Cd	Cd	Si	Ge	Ge	Hf	2.881	1.118	Mg	Mg	Ca	Zn	Sn	Si	Ge	Zr	3.346	0.505	Mg	Zn	Ti	Ti	Al	Al	Al	Sc	4.099	1.652	
Mg	Cd	Zr	Zr	Ga	In	In	In	2.349	0.886	Cd	Mg	Cd	Hf	Al	Sc	Sc	Y	2.881	1.092	Be	Be	Zn	Zn	Si	Ge	Hf	Hf	3.346	0.555	Be	Sr	Ba	Ba	Si	Si	Si	Hf	4.099	1.313	
Ca	Sr	Hf	Hf	Ga	In	In	In	2.349	0.724	Be	Be	Ca	Cd	Sn	Zr	Zr	Zr	2.881	1.103	Be	Be	Be	Ba	Si	Si	Zr	Hf	3.346	0.621	Be	Be	Be	Be	Si	Ge	Ti	Zr	4.100	1.061	
Ca	Sr	Ge	Ge	Al	Al	Y	Y	2.349	0.757	Be	Be	Ba	Zn	Ge	Ge	Ge	Hf	2.881	0.944	Ca	Sr	Sr	Ba	Sn	Sn	Sn	Zr	3.346	0.599	Be	Be	Mg	Ca	Si	Si	Hf	Hf	4.100	1.867	
Sr	Sr	Zn	Zn	Si	Ge	Hf	Hf	2.349	0.870	Mg	Ca	Ca	Cd	Sn	Sn	Ti	Ti	2.881	0.920	Mg	Mg	Mg	Cd	Ge	Sn	Ti	Ti	3.346	0.617	Mg	Mg	Mg	Ca	Ti	Zr	Zr	Hf	4.100	1.303	
Be	Ca	Zr	Zr	In	In	Y	Y	2.350	0.535	Ca	Ca	Ge	Ti	Al	Al	Al	Sc	2.881	-0.062	Be	Cd	Cd	Cd	Ge	Zr	Hf	Hf	3.346	0.594	Mg	Mg	Mg	Ca	Ge	Ti	Zr	Zr	4.101	1.753	
Mg	Ba	Si	Si	Al	Al	In	In	2.350	0.677	Be	Sr	Ti	Hf	Y	Y	Y	Y	2.882	0.672	Ca	Ca	Si	Si	Si	Ga	Sc	Sc	3.346	0.539	Be	Mg	Ge	Zr	Al	Al	Al	Hf	4.101	1.947	
Sr	Ba	Si	Si	Al	Al	In	In	2.350	0.870	Ca	Ba	Si	Si	In	Sc	Sc	Sc	2.882	1.111	Ca	Sr	Ba	Ba	Sn	Zr	Zr	Zr	3.347	0.698	Be	Ca	Ca	Sr	Si	Al	Al	Hf	4.101	1.049	
Ba	Cd	Ge	Hf	Al	Al	Al	Al	2.350	0.502	Mg	Sr	Hf	Hf	Ga	Ga	Ga	Sc	2.882	-0.024	Mg	Ca	Ca	Zn	Sn	Sn	Ti	Ti	3.347	0.896	Be	Be	Ge	Zr	Al	Al	Al	Ga	4.101	1.195	
Sr	Cd	Sn	Zr	Al	Al	Al	Al	2.351	0.662	Be	Zn	Zn	Zn	Ge	Sn	Sn	Hf	2.882	0.178	Zn	Zn	Si	Zr	Sc	Sc	Y	Y	3.347	0.607	Be	Be	Si	Ti	Al	Ga	Ga	Ga	4.102	1.214	
Be	Ba	Si	Si	In	Y	Y	Y	2.351	1.016	Sr	Sr	Ti	Zr	Al	Al	Al	Sc	2.882	0.182	Al	Ga	In	In	Zn	Sc	Sc	Y	Y	3.347	0.755	Be	Be	Ca	Ti	Zr	Al	Zr	Hf	4.103	0.896
Ba	Ba	Cd	Cd	Ge	Ti	Ti	Hf	2.351	0.893	Sr	Cd	Zr	Zr	Al	Al	Al	Y	2.882	0.844	Be	Be	Zn	Zn	Ge	Ge	Zr	Hf	3.347	0.883	Mg	Ca	Ca	Ca	Ge	Ge	Sn	Hf	4.103	0.842	
Mg	Sr	Ge	Sn	Ge	Sc	Sc	Sc	2.351	0.840	Ca	Ca	Zr	Zr	Al	Al	Ga	Y	2.883	1.270	Ca	Ca	Zr	Zr	Al	Al	Ga	Y	3.347	0.552	Mg	Mg	Mg	Ca	Si	Zr	Zr	Hf	4.103	0.734	
Ba	Ba	Ba	Cd	Si	Sn	Sn	Zr	2.351	0.943	Be	Ca	Hf	Hf	Al	Al	Y	Y	2.883	0.246	Mg	Mg	Ca	Cd	Cd	Si	Ge	Ge	3.347	0.619	Be	Mg	Mg	Si	Ti	Sc	Sc	Sc	Y	4.104	1.084
Ba	Ba	Ti	Ti	Ga	In	In	Sc	2.351	0.879	Be	Sr	Ge	Hf	Al	Al	Al	Al	2.883	0.426	Mg	Ca	Ca	Cd	Si	Al	Ti	Ti	3.348	0.588	Mg	Mg	Mg	Ca	Ti	Zr	Hf	Hf	4.104	1.001	
Zn	Zn	Zr	Hf	In	In	Y	Y	2.351	0.978	Be	Ba	Ba	Cd	Zr	Hf	Hf	Hf	2.883	-0.066	Ca	Zn	Si	Si	Si	Al	Al	Sc	3.348	0.885	Be	Be	Mg	Mg	Si	Zr	Zr	Hf	4.104	0.774	
Ba	Cd	Zr	Ga	Ga	Ga	Ga	In	2.351	0.916	Be	Be	Be	Zn	Ge	Sn	Sn	Ti	2.883	0.375	Mg	Mg	Mg	Zn	Si	Sn	Sn	Ti	3.348	0.824	Be	Be	Be	Mg	Si	Sn	Ti	Ti	4.105	0.648	
Mg	Mg	Cd	Cd	Si	Sn	Sn	Zr	2.352	0.675	Zn	Cd	Sn	Hf	Sc	Sc	Sc	Sc	2.883	0.771	Mg	Sr	Sr	Zn	Sn	Sn	Sn	Ti	3.348	0.668	Be	Be	Ca	Ca	Ge	Zr	Zr	Zr	4.105	0.736	
Ca	Ba	Zr	Zr	Ga	In	In	In	2.352	0.911	Mg	Mg	Hf	Hf	Ga	In	In	Y	2.883	0.151	Be	Ca	Ca	Ba	Ge	Ge	Ge	Sn	3.348	1.029	Be	Be	Ca	Ca	Si	Si	Ti	Zr	4.105	0.668	
Be	Sr	Hf	Hf	Ga	Y	Y	Y	2.352	0.913	Sr	Sr	Ba	Zn	Sn	Sn	Sn	Ti	2.883	0.382	Be	Cd	Cd	Cd	Ge	Ti	Hf	Hf	3.348	0.949	Be	Zn	Ti	Hf	Al	Al	Al	Al	4.106	0.703	
Be	Zn	Si	Ti	In	In	In	In	2.352	0.639	Sr	Sr	Ti	Zr	In	Sc	Sc	Sc	2.883	0.101	Ca	Sr	Ti	Ti	Sc	Sc	Y	Y	3.348	0.660	Mg	Mg	Ca	Ca	Ge	Zr	Hf	Hf	4.106	0.843	

Zn	Cd	Ti	Ti	In	In	In	Sc	2.365	0.233	Sr	Sr	Zr	Zr	Al	Sc	Sc	Y	2.890	0.555	Mg	Ba	Ba	Ba	Ge	Sn	Hf	Hf	3.356	0.252	Be	Zn	Si	Zr	Al	Al	Al	Al	4.158	0.928	
Cd	Zn	Zn	Cd	Ti	Ti	Sn	Sn	2.365	0.150	Sr	Ba	Zn	Zn	Ti	Ti	Hf	Hf	2.890	0.770	Be	Cd	Cd	Cd	Si	Si	Ge	Hf	3.356	0.588	Be	Ca	Ca	Ca	Ge	Zr	Hf	Hf	4.158	1.027	
Zn	Cd	Cd	Cd	Si	Si	Ge	Ge	2.365	0.844	Ca	Sr	Ti	Ti	Al	Al	Ga	Ga	2.890	1.086	Mg	Cd	Ge	Hf	Sc	Sc	Sc	Sc	3.356	0.451	Be	Mg	Mg	Ba	Si	Si	Si	Ge	4.160	0.706	
Ca	Ca	Ge	Zr	Al	Al	Ga	Ga	2.365	0.223	Sr	Ba	Zr	Zr	Ga	Sc	Sc	Sc	2.890	0.712	Be	Sr	Ba	Ba	Sn	Sn	Hf	Hf	3.356	0.339	Be	Be	Sn	Ti	Al	Al	Al	Ga	4.161	0.792	
Zn	Zn	Cd	Cd	Si	Si	Sn	Sn	2.365	0.143	Sr	Sr	Zn	Zn	Sn	Ti	Ti	Hf	2.890	0.805	Be	Be	Ca	Cd	Si	Si	Si	Zr	3.356	0.384	Be	Be	Si	Ti	Sc	Sc	Sc	Y	4.162	0.790	
Ca	Ca	Si	Cd	Al	Al	Al	Al	2.365	0.536	Ca	Ca	Zr	Zr	Ga	Ga	In	Sc	2.891	0.579	Be	Be	Be	Be	Zn	Ge	Ti	Ti	Hf	3.356	0.173	Be	Mg	Mg	Ba	Si	Si	Si	Hf	4.162	0.870
Ba	Zn	Cd	Cd	Si	Si	Si	Sn	2.366	0.372	Cd	Cd	Cd	Si	Ti	Ga	Sc	Sc	2.891	0.773	Be	Zn	Cd	Cd	Ge	Zr	Zr	Zr	3.356	0.238	Be	Mg	Ca	Ca	Ti	Ti	Ti	Hf	4.163	0.767	
Sr	Sr	Si	Sn	Al	Sc	Sc	Sc	2.366	0.271	Ba	Cd	Si	Si	Ga	Sc	Sc	Sc	2.891	1.085	Be	Be	Si	Zr	In	In	Sc	Sc	3.356	0.424	Be	Sr	Sr	Ba	Si	Si	Si	Zr	4.163	0.601	
Ca	Ca	Ge	Sn	Sc	Sc	Sc	Y	2.366	0.626	Ca	Ca	Ba	Zn	Sn	Sn	Sn	Zr	2.891	0.749	Mg	Mg	Sn	Sr	Ge	Sn	Sn	Ti	3.356	0.232	Mg	Ca	Ca	Ca	Si	Ge	Hf	Hf	4.163	1.094	
Ca	Ca	Ge	Ge	Al	Al	Sc	Y	2.366	0.373	Ca	Zn	Cd	Cd	Zr	Hf	Hf	Hf	2.891	0.842	Mg	Cd	Cd	Cd	Ti	Zr	Zr	Hf	3.357	0.453	Be	Mg	Mg	Cd	Si	Si	Si	Ti	4.165	0.932	
Mg	Ba	Ge	Ge	Al	Al	Sc	Sc	2.366	0.364	Ca	Ca	Zr	Zr	Al	In	Sc	Sc	2.891	0.893	Be	Ca	Ge	Zr	Al	Al	Al	Al	3.357	0.707	Mg	Ca	Sr	Sr	Si	Si	Si	Ti	4.166	0.665	
Mg	Zn	Sn	Sn	In	Sc	Sc	Sc	2.366	0.808	Ca	Ba	Ba	Zn	Ge	Ge	Zr	Zr	2.891	1.484	Be	Sr	Sr	Zn	Si	Si	Ti	Ti	3.357	0.496	Be	Ca	Sr	Sr	Si	Si	Si	Ti	4.166	0.389	
Cd	Cd	Ti	Ti	Al	In	In	Sc	2.366	0.297	Mg	Sr	Sr	Cd	Ti	Ti	Zr	Zr	2.891	1.827	Mg	Mg	Mg	Cd	Ge	Ti	Zr	Zr	3.357	0.343	Mg	Mg	Ca	Ca	Sn	Ti	Ti	Hf	4.169	0.476	
Be	Be	Cd	Cd	Ge	Sn	Sn	Zr	2.366	0.329	Sr	Cd	Hf	Hf	Al	Y	Y	Y	2.891	0.736	Be	Cd	Zr	Hf	Sc	Sc	Sc	Sc	3.357	0.279	Mg	Zn	Si	Ti	Sc	Sc	Sc	Sc	4.169	0.474	
Sr	Sr	Si	Sn	Al	Y	Y	Y	2.366	0.836	Be	Sr	Cd	Cd	Sn	Hf	Hf	Hf	2.891	0.710	Be	Mg	Ge	Ge	Al	Al	Al	In	3.357	0.213	Mg	Mg	Mg	Zn	Si	Si	Ge	Ti	4.170	0.461	
Ca	Ca	Si	Sn	Al	Y	Y	Y	2.367	0.283	Cd	Cd	Zr	Zr	Al	Ga	Sc	Sc	2.892	0.550	Be	Zn	Sn	Zr	Sc	Sc	Sc	Sc	3.357	0.070	Be	Sr	Sr	Ba	Si	Si	Si	Hf	4.170	0.585	
Ba	Ba	Cd	Cd	Si	Ti	Ti	Zr	2.367	0.322	Mg	Sr	Ba	Ba	Si	Sn	Sn	Sn	2.892	0.918	Sr	Ba	Ba	Ba	Si	Ge	Zr	Zr	3.357	0.637	Be	Mg	Mg	Ca	Zr	Zr	Hf	Hf	4.171	0.548	
Ca	Zn	Ge	Ge	Al	Al	In	In	2.367	0.639	Mg	Ba	Ba	Zn	Si	Ge	Ge	Ge	2.892	1.247	Mg	Sr	Si	Zr	Sc	Sc	Sc	Sc	3.357	0.309	Mg	Ca	Ca	Ca	Ge	Zr	Zr	Hf	4.172	1.180	
Mg	Ca	Sr	Zn	Sn	Sn	Sn	Sn	2.367	0.636	Mg	Sr	Sr	Ba	Ge	Sn	Sn	Sn	2.892	0.584	Sr	Sr	Ba	Ba	Ti	Zr	Zr	Hf	3.357	0.173	Mg	Mg	Ca	Ca	Ge	Zr	Zr	Hf	4.173	1.114	
Ca	Sr	Si	Si	Ga	Ga	Ga	Sc	2.367	0.695	Be	Be	Hf	Hf	In	Sc	Y	Y	2.892	0.639	Be	Sr	Ba	Ca	Hf	Hf	Hf	Hf	3.358	0.364	Be	Mg	Mg	Ca	Ti	Hf	Hf	Hf	4.173	1.003	
Cd	Cd	Zr	Zr	Al	In	In	Sc	2.367	0.800	Sr	Sr	Hf	Ba	Ge	Ge	Zr	Zr	2.892	0.646	Be	Be	Ca	Ge	Ge	Sn	Hf	3.358	0.483	Be	Mg	Ca	Ca	Ti	Ti	Ti	Zr	4.173	0.484		
Sr	Zn	Hf	Ge	Ga	Ga	Y	Y	2.367	0.569	Sr	Sr	Zn	Cd	Zr	Hf	Hf	Hf	2.892	0.864	Be	Mg	Mg	Cd	Si	Zr	Zr	Zr	3.358	0.265	Mg	Mg	Mg	Ca	Si	Sn	Ti	Ti	4.174	0.647	
Sr	Sr	Si	Si	Ge	Al	Al	Y	2.367	0.659	Be	Sr	Cd	Cd	Sn	Zr	Zr	Zr	2.892	1.170	Ca	Ca	Ba	Ba	Sn	Zr	Zr	Hf	3.358	0.737	Be	Ca	Ca	Ca	Si	Sn	Ti	Ti	4.174	0.784	
Ca	Ca	Zn	Zn	Si	Sn	Sn	Zr	2.367	0.824	Be	Be	Ge	Ge	Ga	Sc	Y	Y	2.893	0.774	Be	Be	Sr	Ba	Ge	Zr	Zr	Zr	3.358	0.593	Be	Mg	Mg	Ca	Ti	Ti	Hf	Hf	4.174	0.573	
Ba	Zn	Zn	Cd	Ti	Ti	Ti	Zr	2.367	0.555	Ca	Zn	Zn	Cd	Si	Hf	Hf	Hf	2.893	0.842	Be	Ca	Ca	Zn	Ge	Hf	Hf	Hf	3.358	0.365	Be	Mg	Sr	Zn	Si	Si	Si	Si	4.175	0.753	
Cd	Cd	Hf	Hf	Al	Al	In	Y	2.367	0.651	Zn	Cd	Hf	Hf	Al	Al	Al	In	2.893	0.668	Ca	Ca	Ba	Ge	Sn	Zr	Zr	3.358	0.472	Be	Zn	Ti	Zr	Al	Al	Al	Al	4.176	0.845		
Mg	Mg	Sn	Ti	In	In	In	In	2.367	0.778	Sr	Sr	Ba	Cd	Si	Si	Si	Ge	2.893	0.865	Mg	Mg	Ca	Cd	Si	Si	Hf	Hf	3.358	0.259	Be	Ca	Ca	Ca	Ge	Zr	Zr	Hf	4.177	0.567	
Ca	Ca	Ti	Hf	In	In	Y	Y	2.367	0.611	Mg	Sr	Sr	Zn	Sn	Sn	Ti	2.893	1.167	Mg	Mg	Si	Sn	Al	Al	Al	Sc	3.358	0.271	Mg	Mg	Ca	Ca	Si	Si	Ge	Hf	4.177	0.852		
Sr	Cd	Cd	Cd	Sn	Ti	Hf	Hf	2.367	0.544	Mg	Ca	Si	Si	In	Y	Y	Y	2.893	0.809	Ca	Sr	Sr	Sr	Ge	Sn	Zr	Zr	3.358	0.520	Be	Mg	Mg	Mg	Sn	Zr	Hf	Hf	4.180	1.094	
Ca	Cd	Ti	Ti	In	In	Y	Y	2.367	0.807	Ba	Ba	Ge	Ti	Al	Sc	Sc	Sc	2.893	0.877	Be	Be	Mg	Sr	Zr	Zr	Zr	Hf	3.358	0.640	Mg	Mg	Mg	Ca	Si	Si	Ge	Hf	4.181	0.631	
Sr	Cd	Zr	Zr	Ga	Ga	Y	Y	2.368	0.610	Be	Zn	Sn	Hf	Y	Y	Y	Y	2.893	0.704	Ca	Ca	Ba	Zn	Ti	Ti	Ti	Hf	3.358	0.551	Be	Mg	Mg	Ba	Si	Si	Si	Zr	4.181	0.952	
Be	Ca	Si	Si	Ga	Ga	In	In	2.368	0.537	Ca	Ba	Ba	Cd	Zr	Hf	Hf	Hf	2.893	1.063	Mg	Zn	Cd	Cd	Ti	Ti	Hf	Hf	3.358	0.873	Mg	Ca	Ba	Ca	Ge	Ti	Hf	Hf	4.181	1.169	
Cd	Cd	Zr	Zr	Al	In	In	Sc	2.368	0.823	Mg	Mg	Cd	Cd	Si	Ge	Hf	Hf	2.893	1.364	Be	Be	Mg	Ba	Ti	Ti	Ti	Zr	3.358	0.740	Be	Be	Si	Si	Al	Ga	Zr	Sc	4.182	0.430	
Be	Zn	Ge	Ge	In	Y	Y	Y	2.368	0.799	Ca	Ba	Zr	Zr	Al	Y	Y	Y	2.893	0.678	Mg	Mg	Ba	Zn	Ge	Ge	Ge	Zr	3.359	0.635	Be	Mg	Mg	Ca	Si	Al	Zr	Zr	4.183	0.513	
Be	Ca	Ti	Ti	In	In	Y	Y	2.368	0.787	Mg	Mg	Si	Zr	Ga	Ga	Y	Y	2.893	0.683	Ca	Sr	Sr	Zn	Ti	Zr	Zr	Zr	3.359	0.626	Mg	Mg	Mg	Ca	Ge	Ti	Hf	4.183	0.521		
Be	Be	Mg	Cd	Ge	Sn	Sn	Sn	2.368	0.051	Be	Ca	Ge	Ge	Sc	Y	Y	Y	2.893	0.776	Be	Zn	Cd	Cd	Ti	Ti	Zr	Zr	3.359	0.423	Mg	Mg	Mg	Ca	Ge	Ti	Ti	Hf	4.184	1.235	
Ca	Zn	Zn	Ge	Ge	Sn	Sn	Hf	2.368	-0.081	Ca	Zn	Cd	Cd	Si	Hf	Hf	Hf	2.893	0.987	Mg	Mg	Zr	Zr	In	Sc	Sc	Y	3.359	0.539	Be	Mg	Mg	Ca	Zn	Zr	Zr	Hf	4.185	1.119	
Ca	Ca	Si	Hf	Ga	Ga	Ga	Y	2.369	-0.081	Mg	Mg	Sr	Zn	Sn	Sn	Sn	Hf	2.893	1.265	Mg	Mg	Mg	Cd	Si	Si	Sn	Ti	3.359	0.669	Mg	Mg	Ca	Ca	Sn	Ti	Ti	Zr	4.186	0.950	
Cd	Ba	Ge	Zr	Al	Al	Al	Ga	2.369	0.325	Mg	Cd	Hf	Al	Al	Y	Y	Y	2.893	0.844	Sr	Ba	Ba	Ba	Ti	Zr	Zr	Hf	3.359	0.485	Be	Be	Ti	Ti	Al	Ga	Sc	Sc	4.186	1.484	
Cd	Cd	Ge	Zr	Al	Al	Y	Y	2.369	-0.050	Be	Sr	Sr	Ba	Ge	Ge	Sn	Sn	2.894	0.864	Sr	Sr	Sr	Ba	Ti	Zr	Zr	Hf	3.359	0.750	Mg	Ca	Ca	Ba	Si	Si	Hf	4.186	1.258		
Ca	Ba	Si	Si	Al	Ga	Ga	Ga	2.369	-0.092	Ca	Ca	Sr	Cd	Ge	Ge	Ge	Zr	2.894	0.795	Be	Mg	Zn	Sn	Hf	Al	Al	Al	3.359	1.061	Mg	Ca	Ca	Ca	Si	Ge	Zr	Zr	4.187	1.024	
Be	Be	Ba	Zn	Sn	Sn	Sn	Hf	2.369	0.283	Mg	Zn	Ge	Sn	Y	Y	Y	Y	2.894	0.984	Mg	Mg	Cd	Cd	Cd	Si	Si	Sn	3.359	0.850	Be	Mg	Mg	Ca	Ti	Zr	Zr	Zr	4.188	0.689	
Sr	Sr	Ge	Sn	Sc	Y	Y	Y	2.370	-0.063	Be	Be	Si	Sn	Ga	Ga	Ga	In	2.894	1.259	Be	Be	Ti	Zr	Al	Al	In	In	3.359	0.712	Mg	Ca	Ca	Ca	Sn	Sn	Ti	Ti	4.189	0.813	
Ba	Ba	Zr	Hf	In	In	Sc	Sc	2.370	-0.106	Ba	Ba	Zr	Hf	Al	Al	Sc	Sc	2.894	0.875	Mg	Ca	Cd	Cd	Cd	Si	Si	Si	Ti	3.360	0.716	Be	Mg	Mg	Ca	Zr	Hf	Hf	Hf	4.189	0.826
Ca	Cd	Zr	Zr	Ga	Ga	In	In	2.370	0.524	Sr	Sr	Si	Ti	Al	Al	Al	Sc	2.894	0.896	Mg	Mg	Zn	Cd	Ti	Ti	Ti	Zr	3.360	0.595	Be	Be	Mg	Mg	Si	Ti	Hf	Hf	4.189	0.716	

Mg	Mg	Ge	Sn	Al	Ga	Ga	2.381	0.097	Mg	Mg	Cd	Cd	Ge	Ge	Zr	Hf	2.901	1.060	Mg	Mg	Sr	Cd	Ge	Ti	Ti	Ti	3.367	0.541	Be	Ca	Ca	Ca	Si	Zr	Zr	Hf	4.256	0.712	
Cd	Zn	Sn	Sn	In	In	Sc	Sc	2.381	-0.115	Mg	Zn	Hf	Hf	In	Y	Y	Y	2.901	0.894	Be	Mg	Si	Si	Al	Al	In	In	3.367	0.524	Be	Ca	Ca	Ca	Ti	Zr	Hf	Hf	4.256	0.934
Cd	Cd	Si	HF	In	In	Sc	Sc	2.381	-0.200	Ca	Ba	Ge	HF	Y	Y	Y	Y	2.902	1.062	Mg	Mg	Ge	HF	Sc	Sc	Y	Y	3.367	0.876	Mg	Ca	Ca	Ca	Si	Si	Si	HF	4.257	1.087
Sr	Ba	Ba	Cd	Sn	Sn	Sn	HF	2.381	0.071	Zn	Cd	Ti	Ti	Al	Al	Y	Y	2.902	1.309	Mg	Mg	Md	Ba	Si	Si	Sn	Zr	3.367	0.597	Be	Mg	Mg	Mg	Ge	Ge	Sn	HF	4.258	0.600
Ca	Ca	Sn	Zr	Al	Al	Y	Y	2.381	0.044	Mg	Sr	Zn	Zn	Ge	Ge	HF	HF	2.902	0.927	Mg	Mg	Cd	Cd	Zr	Zr	Zr	Hf	3.368	0.562	Be	Mg	Mg	Sr	Si	Si	Ti	Ti	4.258	0.692
Cd	Cd	Zr	In	In	In	Sc	Y	2.381	0.029	Mg	Mg	Ba	Ba	Si	Ge	Sn	Sn	2.902	0.916	Mg	Mg	Zr	HF	Ga	Ga	Y	3.368	0.875	Mg	Mg	Mg	Ca	Si	Si	Zr	Hf	4.259	0.704	
Ba	Cd	Cd	Cd	Sn	Zr	Zr	Hf	2.381	0.025	Zn	Zn	Sn	Zr	In	Sc	Sc	Sc	2.902	0.911	Mg	Zn	Si	Si	Al	Ga	Sc	3.368	0.672	Be	Ca	Ca	Ca	Sn	Ti	Ti	Zr	4.260	0.925	
Ca	Cd	Ge	In	Sc	Sc	Sc	Sc	2.381	-0.091	Mg	Sr	Zr	Zr	Al	Al	Y	Y	2.902	1.058	Ca	Zn	Zr	HF	Y	Y	Y	3.368	0.617	Be	Mg	Mg	Ge	Ge	Ge	Ge	4.260	0.914		
Sr	Sr	Ti	Ti	Ga	In	In	Sc	2.382	-0.144	Ba	Cd	Zr	Zr	In	Sc	Sc	Sc	2.902	1.302	Mg	Mg	Mg	Ba	Ge	Sn	HF	HF	3.368	0.835	Be	Mg	Mg	Ca	Ti	Ti	Ti	HF	4.262	0.830
Mg	Cd	Sn	Sn	Sc	Y	Y	Y	2.382	0.344	Ba	Ba	Si	Ge	Sc	Sc	Y	Y	2.902	0.956	Be	Mg	Cd	Cd	Ge	Ge	Ti	Ti	3.368	0.648	Be	Mg	Ca	Ba	Si	Si	Si	4.262	1.051	
Ca	Zn	Zr	In	In	In	Y	Y	2.382	0.008	Mg	Zn	Ge	Ti	Ga	Ga	Ga	2.903	0.947	Be	Be	Ca	Ga	Ge	Ga	Sn	Ti	3.368	0.672	Be	Ca	Ca	Ca	Sn	Ti	Ti	HF	4.262	1.017	
Be	Mg	Ge	Zr	In	In	In	In	2.382	-0.157	Ca	Ca	Ba	Cd	Si	Si	Ge	Ge	2.903	0.951	Be	Be	Si	Sn	Al	Ga	Ga	3.368	0.691	Be	Mg	Mg	Sr	Si	Si	Si	HF	4.263	0.828	
Ca	Cd	Zr	Zr	In	In	In	Sc	2.382	0.309	Ca	Cd	Zr	Ti	In	Y	Y	Y	2.903	1.083	Sr	Cd	Si	Ti	Sc	Sc	Sc	3.368	0.485	Mg	Ca	Ca	Ca	Si	Ti	Zr	Zr	4.263	0.752	
Ba	Zn	Ge	Sn	Sc	Sc	Sc	Sc	2.382	-0.073	Mg	Ca	Ba	Ba	Si	Sn	Sn	Sn	2.903	1.296	Mg	Zn	Zr	Zr	Al	Ga	Ga	3.368	0.475	Mg	Ca	Ca	Ca	Si	Si	Sn	Ti	4.264	0.801	
Ba	Zn	Cd	Cd	Sn	Zr	Zr	Zr	2.383	-0.190	Be	Ba	Be	Ba	Sn	Sn	Ti	HF	2.903	0.961	Ca	Sr	Sr	Ba	Sn	Zr	Zr	3.369	0.589	Mg	Mg	Ca	Ca	Si	Si	Si	Zr	4.267	0.747	
Mg	Ca	Ti	Ti	In	In	In	Y	2.383	0.641	Ca	Ca	Zr	Zr	In	Sc	Sc	Y	2.904	0.934	Ca	Ca	Ba	Ba	Si	Sn	HF	HF	3.369	0.360	Be	Ca	Ca	Ca	Ti	Ti	Zr	HF	4.268	0.764
Be	Sr	HF	HF	Ga	Ga	In	In	2.383	-0.035	Be	Be	Ge	HF	Al	Al	Y	Y	2.904	0.973	Be	Ca	Si	Ge	Sc	Sc	Sc	3.369	0.367	Mg	Mg	Ca	Ca	Si	Ti	Ti	HF	4.268	0.843	
Sr	Cd	Cd	Cd	Ti	Ti	Zr	HF	2.383	-0.199	Be	Be	Si	Sn	Al	Al	Y	Y	2.904	1.579	Be	Cd	Cd	Cd	Ge	Zr	Zr	HF	3.369	0.882	Mg	Mg	Ca	Ca	Ge	Ti	Zr	4.270	0.766	
Sr	Sr	Ti	Ti	Al	In	In	Sc	2.383	0.696	Be	Be	Be	Zn	Ge	Ge	Sn	Zr	2.904	1.889	Be	Ca	Si	Si	Al	Al	In	3.369	0.410	Be	Be	Mg	Mg	Sn	Ti	Ti	Zr	4.271	1.027	
Sr	Ba	Si	HF	Ga	Ga	Ga	Ga	2.383	-0.028	Ca	Zn	Ge	Ge	Al	Sc	Sc	Sc	2.904	0.721	Ca	Ca	Si	HF	Sc	Y	Y	Y	3.369	0.426	Be	Ca	Ca	Ca	Ti	Zr	HF	HF	4.271	0.992
Mg	Mg	Ge	HF	In	In	In	Sc	2.384	-0.199	Ca	Ca	Ba	Cd	Ti	HF	HF	HF	2.904	0.648	Sr	Zn	Ti	HF	Sc	Sc	Sc	3.369	0.595	Be	Ca	Ca	Ca	Si	Ge	HF	HF	4.271	0.879	
Ba	Ba	HF	HF	Ga	In	In	Sc	2.384	0.330	Ba	Cd	Zr	Zr	Al	Al	Ga	2.904	1.178	Be	Mg	Ti	Ti	Al	Al	In	In	3.369	0.548	Be	Be	Mg	Mg	Ge	Zr	HF	4.272	0.733		
Be	Cd	Ge	Ge	Ga	Ga	Ga	Sc	2.384	0.126	Be	Mg	Sr	Sr	Ge	Ge	Sn	Sn	2.904	1.717	Mg	Sr	Zn	Zn	Sn	Zr	Zr	3.369	0.558	Be	Ca	Ca	Ca	Si	Si	Sn	Ti	4.273	0.746	
Sr	Sr	Ba	Zn	Ge	Sn	Sn	Sn	2.384	0.022	Zn	Zn	Ge	Ti	Al	Al	Ga	Ga	2.904	2.023	Ca	Cd	Ti	Ti	Ga	Sc	Sc	Sc	3.369	0.902	Be	Mg	Ca	Ca	Ge	Ge	HF	HF	4.274	0.772
Be	Ca	Ca	Zn	Si	Sn	Sn	Sn	2.384	0.312	Be	Be	Ti	Ti	Ga	In	Y	Y	2.904	0.964	Be	Be	Ca	Cd	Ge	Ge	Ti	Ti	3.369	0.610	Be	Be	Be	Mg	Si	Ge	Ti	4.275	0.766	
Ca	Sr	Zr	Zr	Al	In	In	In	2.384	0.068	Mg	Ba	Cd	Cd	Ti	Ti	HF	HF	2.905	0.878	Ca	Cd	Ti	Zr	Y	Y	Y	Y	3.369	0.611	Be	Zn	Si	Si	Al	Al	Al	Sc	4.276	0.786
Cd	Cd	Ge	Ga	Ga	Ga	Ga	Sc	2.384	0.015	Mg	Cd	Si	Sn	Y	Y	Y	Y	2.905	0.846	Mg	Zn	Cd	Cd	Si	Si	Zr	Zr	3.369	0.897	Mg	Mg	Ca	Ca	Si	Si	Ge	Ti	4.276	0.747
Ba	Ba	Cd	Cd	Sn	Zr	Zr	HF	2.385	0.634	Ba	Ba	Ti	HF	Sc	Sc	Sc	Y	2.905	1.166	Ca	Ca	Sr	Ba	Sn	HF	HF	3.370	0.688	Be	Mg	Mg	Ca	Ti	Ti	Zr	4.279	0.731		
Be	Mg	Cd	Cd	Sn	Sn	Sn	Zr	2.385	0.095	Ba	Ba	Ba	Zn	Si	Si	Zr	HF	2.905	1.468	Sr	Sr	Ba	Ba	Ge	Zr	HF	HF	3.370	0.689	Be	Mg	Mg	Sr	Si	Si	Ge	4.280	0.842	
Ba	Ba	Zn	Zn	Si	Ge	Ge	Zr	2.385	0.009	Ca	Sr	Cd	Sn	Ti	Ti	Ti	2.905	0.837	Ca	Ba	Ba	Ba	Ti	Ti	Zr	HF	3.370	0.608	Be	Be	Si	Ti	Al	Sc	Sc	Sc	4.281	0.980	
Cd	Cd	Si	Sn	Ge	Sc	Sc	Sc	2.385	0.688	Mg	Sr	HF	HF	Al	Al	In	2.905	0.839	Be	Cd	Cd	Cd	Sn	Ti	Ti	Zr	3.370	0.565	Be	Be	Si	HF	Al	Al	Al	Sc	4.282	0.749	
Be	Zn	Ge	Ge	In	In	Sc	Sc	2.385	0.099	Mg	Sr	Ge	Zr	Al	Al	Al	In	2.905	0.925	Be	Be	Zr	HF	In	In	Sc	Sc	3.370	0.552	Be	Mg	Mg	Sr	Si	Si	Si	Zr	4.284	0.878
Cd	Cd	Zr	HF	Ga	Ga	Y	Y	2.386	0.009	Be	Cd	Zr	HF	Y	Y	Y	Y	2.905	1.100	Mg	Mg	Zn	Zn	Si	Ge	Sc	Sc	3.370	0.897	Mg	Mg	Ca	Zn	Si	Si	Si	Ti	4.285	1.001
Ca	Sr	Zn	Cd	Ge	Ge	Ge	Ge	2.386	0.286	Mg	Ca	Cd	Cd	Si	Si	Zr	Y	2.905	1.387	Mg	Mg	Zn	Zn	Si	Ge	Zr	Zr	3.370	0.617	Be	Ca	Ca	Ca	Si	Ge	Zr	Zr	4.285	0.688
Ba	Ba	Ti	Zr	In	In	Sc	Sc	2.386	0.377	Cd	Cd	Si	Ti	Al	Al	In	2.905	1.020	Zn	Zn	Si	Zr	In	Sc	Sc	Sc	3.370	0.587	Mg	Mg	Ca	Ca	Si	Ti	Ti	Zr	4.286	0.768	
Mg	Ba	Ba	Cd	Sn	Sn	Ti	Ti	2.386	0.375	Mg	Mg	Si	Zr	Ga	Ga	In	2.905	1.042	Mg	Sr	Ba	Ba	Ba	Sn	Sn	HF	3.370	0.907	Be	Ca	Ca	Ca	Si	Si	Sn	HF	4.287	0.780	
Cd	Cd	HF	HF	Al	Al	Ga	In	2.386	0.589	Ca	Zn	Cd	Cd	Si	Zr	Zr	2.905	0.944	Mg	Zn	Zn	Cd	Si	Si	Si	Sn	3.370	0.707	Mg	Mg	Mg	Ca	Si	Ge	Ti	4.287	0.932		
Ca	Ca	Si	Ti	In	In	Y	Y	2.386	0.425	Ca	Ca	Si	Ge	Al	Al	Sc	Sc	2.905	1.099	Ca	Ca	Ba	Ba	Sn	Sn	Ti	Zr	3.371	0.645	Be	Mg	Mg	Mg	Si	Sn	HF	4.288	0.926	
Sr	Zn	Zn	Zn	Si	Ge	Sn	Zr	2.386	0.372	Mg	Mg	Zn	Cd	Ge	Ge	HF	HF	2.905	1.382	Ca	Ca	Sr	Sr	Ge	Sn	HF	HF	3.371	0.863	Be	Mg	Mg	Mg	Ge	Sn	Zr	4.288	0.847	
Sr	Sr	Zn	Zn	Sn	Si	Ge	Zr	2.387	0.640	Be	Ca	Ti	Ti	Ga	Ga	In	2.906	1.053	Be	Mg	Ba	Zn	HF	HF	HF	HF	3.371	0.680	Mg	Mg	Mg	Mg	Ge	Sn	Zr	4.288	1.051		
Ba	Ba	Si	Si	Ge	In	Sc	Sc	2.387	0.431	Mg	Mg	Ge	Ti	In	In	Sc	Sc	2.906	1.076	Be	Ba	Zn	Zn	Si	Si	HF	HF	3.371	0.693	Be	Ca	Ca	Ca	Si	Si	Sn	Zr	4.288	1.025
Ca	Sr	Cd	Cd	Ge	Ge	Ge	Ti	2.387	0.371	Be	Sr	Sr	Cd	Ti	Zr	Zr	Zr	2.906	1.305	Mg	Zn	HF	HF	Sc	Sc	Y	Y	3.371	0.519	Be	Ca	Ca	Ca	Si	Ti	HF	HF	4.290	0.840
Sr	Sr	Zn	Zn	Si	Ge	Zr	Zr	2.387	0.505	Mg	Ca	Ge	Ge	Al	Sc	Sc	Sc	2.906	1.845	Mg	Ca	Si	Si	Al	Y	Y	Y	3.371	0.391	Be	Be	Si	HF	Al	Al	Al	Ge	4.291	0.776
Sr	Sr	HF	HF	Al	In	In	Sc	2.387	0.313	Cd	Cd	Ge	Ti	Al	Y	Y	Y	2.906	2.143	Mg	Sr	Ba	Zn	Ti	Ti	Ti	Ti	3.371	0.236	Be	Mg	Mg	Zn	Si	Si	Si	HF	4.292	0.821
Mg	Ca	Ti	Zr	In	In	In	In	2.388	0.193	Be	Ba	Ge	HF	Ga	Ga	Ga	2.906	1.061	Be	Ba	Zn	Cd	Ti	Ti	HF	HF	3.371	-0.024	Be	Ca	Ca	Ba	Si	Si	Si	Ti	4.293	0.766	
Cd	HF	HF	In	In	Y	Y	Y	2.388	0.558	Mg	Ba	Ti	Ti	Al	Al	In	2.906	0.945	Mg	Ca	Si	Si	Al	Al	Y	Y	3.371	0.155	Be	Mg									

Mg	Cd	Cd	Cd	Si	Sn	Zr	2.399	-0.029	Ca	Zn	Zn	Zn	Ge	Ge	Zr	Hf	2.914	0.520	Mg	Mg	Sr	Sr	Ge	Ge	Sn	Zr	3.379	1.018	Be	Be	Ti	Zr	Al	Al	Al	Sc	4.381	1.297	
Be	Be	Ba	Zn	Sn	Sn	Zr	2.399	0.497	Be	Mg	Ti	Ti	In	In	In	Y	2.914	0.693	Mg	Ba	Ba	Ba	Sn	Ti	Zr	3.379	1.244	Be	Mg	Ti	Ti	Al	Al	Al	Sc	4.384	0.657		
Ca	Ca	Zn	Cd	Ge	Ge	Ge	2.399	-0.037	Be	Be	Be	Ca	Si	Sn	Sn	Hf	2.915	0.231	Mg	Mg	Mg	Cd	Si	Zr	Zr	Hf	3.379	1.148	Be	Be	Si	Ge	Al	Al	Al	Sc	4.385	0.995	
Sr	Ba	Zn	Zn	Sn	Sn	Ti	2.399	-0.034	Zn	Cd	Cd	Cd	Ge	Ge	Zr	Hf	2.915	0.709	Ca	Ca	Ca	Zn	Si	Ti	Hf	Hf	3.379	1.182	Mg	Ca	Ca	Ca	Si	Ti	Ti	Hf	4.391	1.301	
Ba	Ba	Ge	Ti	Ge	Ge	Ge	2.399	0.269	Ca	Ca	Si	Hf	Al	Al	Al	In	2.915	1.102	Ca	Ca	Ba	Ba	Ti	Ti	Zr	Hf	3.379	1.328	Be	Be	Ti	Zr	Al	Al	Al	Ga	4.391	0.405	
Be	Sr	Si	Ti	In	Y	Y	2.400	0.396	Be	Zn	Ti	Ti	In	In	In	Sc	2.915	0.431	Ca	Sr	Sr	Ba	Sn	Ge	Ti	3.379	1.213	Be	Be	Mg	Mg	Ge	Ge	Ti	Hf	4.391	0.455		
Zn	Zn	Si	Sn	Al	Al	Y	2.400	0.358	Be	Zn	Si	Si	Al	Al	In	In	2.915	0.645	Be	Ca	Zn	Zn	Sn	Ge	Ge	Hf	3.379	0.853	Be	Be	Mg	Mg	Si	Sn	Ti	3.393	0.430		
Be	Mg	Sn	Sn	Al	Ga	Ga	2.401	0.466	Be	Be	Ba	Zn	Ge	Ge	Ge	Zr	2.915	0.398	Mg	Mg	Mg	Ba	Si	Ge	Ge	Sn	3.379	0.811	Be	Mg	Ti	Hf	Al	Al	Al	Al	4.393	1.504	
Ca	Ca	Zr	Hf	In	In	Y	2.401	0.364	Sr	Ba	Ba	Zn	Si	Si	Hf	Hf	2.915	0.724	Be	Be	Sn	Hf	Sc	Sc	Sc	Y	3.379	1.006	Be	Zn	Si	Ti	Al	Al	Al	Al	4.393	1.338	
Sr	Sr	Zn	Zn	Ge	Ge	Ge	2.401	0.331	Ca	Ca	Zn	Zn	Si	Ge	Ti	Ti	2.915	1.077	Ca	Zn	Hf	Hf	Sc	Sc	Sc	Y	3.379	0.890	Mg	Ca	Ca	Ca	Si	Ti	Ti	Zr	4.396	1.075	
Zn	Zn	Zr	Hf	In	In	Y	2.401	0.501	Sr	Cd	Si	Zr	Al	Al	Al	Al	2.915	0.655	Mg	Mg	Zn	Ti	Al	Al	Al	In	3.379	0.868	Be	Mg	Mg	Ca	Si	Si	Ge	Ge	4.399	1.734	
Zn	Zn	Ge	Ge	Al	In	Sc	2.401	0.357	Mg	Mg	Cd	Cd	Si	Ge	Ge	Zr	2.915	0.856	Mg	Sr	Sr	Zn	Ge	Ge	Ge	Ti	3.379	1.220	Be	Be	Be	Mg	Si	Ge	Ti	Ti	4.399	1.516	
Ca	Cd	Si	Zr	Ga	Ga	Ga	2.401	0.326	Be	Ca	Cd	Cd	Ge	Ge	Ge	Zr	2.915	0.431	Be	Sr	Ba	Ba	Sn	Sn	Zr	3.379	0.551	Be	Ca	Ca	Ca	Si	Ge	Ge	Hf	4.401	1.118		
Sr	Sr	Si	Si	Al	Al	Ga	Y	2.402	0.293	Mg	Cd	Si	Si	In	Y	Y	2.916	0.735	Al	Ga	Ga	In	In	Sc	Sc	Y	3.379	0.408	Be	Mg	Mg	Ca	Ge	Ti	Ti	Ti	4.403	0.731	
Be	Sr	Zn	Zn	Ge	Ge	Sn	Sn	2.402	0.116	Ca	Zn	Zn	Cd	Si	Si	Ge	Ge	2.916	1.080	Be	Zn	Zr	Zr	Al	Ga	Ga	3.380	0.323	Be	Ca	Ca	Ca	Si	Si	Ge	Zr	4.405	0.836	
Mg	Cd	Ti	Ti	In	In	In	Y	2.402	0.051	Zn	Zn	Zr	Zr	In	In	Sc	Sc	2.916	0.694	Mg	Ba	Zn	Cd	Si	Si	Si	3.380	0.238	Mg	Mg	Ca	Ca	Si	Si	Ti	Hf	4.407	0.814	
Ca	Ca	Cd	Cd	Si	Si	Zr	Hf	2.402	0.330	Be	Cd	Cd	Cd	Ge	Sn	Hf	Hf	2.916	0.892	Ca	Ca	Sr	Ba	Ti	Ti	Hf	Hf	3.380	0.258	Be	Ca	Ca	Ca	Si	Ge	Ge	Ti	4.411	0.794
Mg	Mg	Ge	Ge	Sn	Ga	Sc	Sc	2.402	0.120	Ca	Ca	Sn	Ti	Sc	Sc	Sc	Y	2.916	0.372	Be	Be	Sr	Sr	Sn	Sn	Ti	Hf	3.380	0.182	Be	Mg	Ca	Ca	Ge	Ge	Ti	Ti	4.412	0.924
Ba	Cd	Ge	Ge	Al	Sc	Sc	Sc	2.403	0.046	Be	Ca	Si	Hf	Ga	Ga	Ga	Ga	2.916	0.833	Mg	Cd	Cd	Cd	Ge	Ti	Ti	Hf	3.380	0.424	Mg	Mg	Mg	Ca	Si	Si	Ge	Ti	4.412	0.827
Ca	Sr	Zr	Zr	In	In	In	Sc	2.403	0.300	Sr	Ba	Zn	Cd	Hf	Hf	Hf	Hf	2.916	1.195	Ca	Ba	Ba	Zn	Si	Si	Si	Hf	3.380	0.322	Be	Be	Mg	Zn	Si	Si	Si	Ge	4.417	1.833
Be	Ba	Ti	Ti	Ti	Ga	Ga	Ga	In	2.403	0.274	Ba	Zn	Si	Si	Al	Al	Sc	Sc	2.916	0.517	Be	Mg	Ge	Zr	Y	Y	Y	3.380	0.251	Be	Mg	Mg	Sr	Si	Si	Si	Ti	4.417	1.769
Ca	Ge	Hf	Al	Al	Al	Y	2.404	0.261	Sr	Ba	Ge	Zr	Y	Y	Y	Y	2.916	0.685	Mg	Cd	Ti	Ti	Al	Al	Al	In	3.380	0.304	Be	Mg	Mg	Mg	Sn	Zr	Hf	Hf	4.419	1.620	
Mg	Zn	Si	Si	In	In	Y	2.404	0.330	Mg	Sr	Sn	Ti	Y	Y	Y	Y	2.916	0.520	Be	Ca	Ti	Ti	Al	Al	Al	In	3.380	0.448	Be	Mg	Ca	Ca	Si	Si	Hf	Hf	4.419	0.841	
Sr	Cd	Cd	Cd	Sn	Ti	Zr	Zr	2.404	0.223	Cd	Cd	Ge	Ti	Al	Al	Sc	Sc	2.916	0.831	Mg	Mg	Zn	Zn	Si	Ge	Ge	Zr	3.380	0.303	Be	Ca	Ca	Ca	Si	Ti	Ti	Zr	4.420	1.063
Be	Be	Cd	Cd	Si	Ge	Sn	Sn	2.404	0.174	Be	Be	Zr	Hf	Ga	Ga	Y	2.916	1.152	Be	Ge	Ge	Zr	Sc	Y	Y	Y	3.380	0.504	Mg	Mg	Ca	Ca	Si	Ge	Ti	Ti	4.421	1.262	
Mg	Sr	Cd	Cd	Ge	Ge	Hf	Hf	2.404	0.635	Be	Ba	Si	Zr	Y	Y	Y	2.916	0.721	Mg	Ca	Zr	Zr	Sc	Sc	Sc	Y	3.380	0.528	Be	Ca	Ca	Ca	Si	Ti	Ti	Hf	4.422	0.918	
Ba	Ba	Cd	Cd	Sn	Zr	Zr	Hf	2.404	0.311	Be	Ge	Ge	Hf	Ga	Y	Y	2.916	0.878	Be	Mg	Ba	Ba	Si	Si	Si	Sn	3.380	0.368	Mg	Mg	Ca	Ca	Si	Si	Ti	Zr	4.425	1.136	
Be	Ba	Ba	Cd	Ge	Ge	Hf	Hf	2.404	0.153	Zn	Cd	Ti	Ti	Al	Al	Ga	Ga	2.917	0.550	Be	Be	Ba	Si	Si	Ge	Ti	3.380	0.325	Be	Be	Mg	Mg	Ge	Ge	Ti	Zr	4.427	1.242	
Be	Be	Si	Ge	In	In	Y	2.404	0.620	Sr	Ba	Bz	Zn	Ti	Ti	Zr	Zr	2.917	0.839	Be	Be	Ca	Ca	Ge	Ge	Sn	Zr	3.380	0.238	Be	Mg	Si	Zr	Al	Al	Al	Al	4.428	0.922	
Be	Ca	Ti	Ti	In	In	In	Y	2.404	0.230	Be	Cd	Cd	Cd	Sn	Sn	Ti	Hf	2.917	1.153	Be	Be	Ca	Ba	Ti	Ti	Zr	Zr	3.381	0.249	Be	Mg	Si	Si	Al	Al	Al	Ga	4.431	1.281
Ba	Ba	Ba	Cd	Ge	Sn	Sn	Hf	2.404	0.116	Mg	Mg	Ge	Hf	In	Y	Y	2.917	0.758	Zn	Zn	Ti	Hf	Ga	Sc	Sc	Sc	3.381	0.355	Mg	Ca	Ca	Ca	Si	Ge	Ge	Ti	4.433	1.610	
Be	Ca	Cd	Cd	Ge	Ge	Ge	Sn	2.405	0.917	Cd	Cd	Sn	Ti	Al	Sc	Sc	Sc	2.917	0.912	Mg	Mg	Mg	Zn	Ge	Sn	Zr	Zr	3.381	0.489	Be	Mg	Mg	Ca	Si	Si	Hf	Hf	4.436	0.971
Ba	Ba	Zn	Cd	Si	Si	Si	Ge	2.405	0.235	Ca	Ca	Ca	Cd	Si	Ti	Hf	Hf	2.917	0.438	Be	Be	Ca	Zn	Sn	Sn	Ti	Ti	3.381	0.400	Be	Mg	Ca	Ca	Si	Si	Si	Ge	4.437	1.347
Ca	Sr	Sr	Zn	Ge	Sn	Sn	Sn	2.405	0.088	Ca	Ca	Ba	Ba	Sn	Sn	Sn	Ti	2.917	0.712	Sr	Zn	Zr	Hf	Sc	Sc	Sc	Sc	3.381	0.544	Be	Mg	Mg	Ca	Si	Si	Zr	Zr	4.438	1.604
Zn	Cd	Zr	Zr	In	In	In	Sc	2.405	0.965	Be	Ca	Sn	Hf	Sc	Sc	Sc	Sc	2.917	1.002	Sr	Ba	Ba	Ba	Ge	Ti	Zr	Zr	3.381	0.561	Be	Mg	Mg	Mg	Sn	Zr	Zr	Hf	4.447	0.731
Be	Ca	Ge	Ge	Al	Al	Ga	Ga	2.405	0.237	Be	Cd	Hf	Hf	Sc	Sc	Y	2.917	0.630	Ca	Ca	Ba	Ba	Ge	Sn	Zr	Zr	3.382	0.453	Mg	Ca	Ca	Ca	Si	Si	Zr	Hf	4.453	0.818	
Mg	Ba	Hf	Hf	In	Y	Y	2.405	0.084	Ca	Sr	Sr	Cd	Si	Ti	Ti	Ti	2.917	0.788	Mg	Ba	Ba	Zn	Zr	Zr	Hf	Hf	3.382	0.390	Be	Ca	Ca	Ca	Si	Si	Zr	Hf	4.454	0.797	
Ca	Sr	Cd	Cd	Si	Si	Ge	Ge	2.405	0.652	Be	Be	Ge	Zr	In	Y	Y	2.918	0.469	Be	Be	Zn	Cd	Si	Si	Ge	Ge	3.382	0.308	Be	Mg	Mg	Ca	Si	Ti	Ti	Ti	4.458	0.855	
Ba	Ba	Cd	Cd	Ge	Zr	Hf	Hf	2.405	0.432	Ba	Zn	Zr	Zr	Al	Al	Al	In	2.918	0.721	Be	Ba	Zn	Zn	Sn	Ti	Ti	Ti	3.382	0.334	Be	Mg	Mg	Mg	Si	Si	Sn	Hf	4.458	0.764
Ca	Ca	Sn	Ti	Al	Al	Al	Y	2.405	0.330	Sr	Ba	Zr	Zr	Al	Al	Sc	Sc	2.918	1.005	Sr	Ba	Ba	Ba	Ge	Zr	Zr	Hf	3.382	0.384	Mg	Mg	Mg	Mg	Ge	Sn	Ti	Hf	4.459	0.551
Mg	Ca	Hf	Hf	In	In	Y	2.406	0.634	Mg	Mg	Si	Sn	Al	Al	Ga	Ga	2.918	0.668	Ca	Sr	Sr	Ba	Ti	Ti	Hf	Hf	3.382	0.320	Be	Mg	Ca	Zn	Si	Si	Si	Si	4.461	1.050	
Sr	Sr	Cd	Cd	Sn	Ti	Ti	Hf	2.406	0.373	Mg	Ba	Ge	Zr	Sc	Sc	Sc	Sc	2.918	0.823	Ca	Ca	Ti	Zr	Al	Sc	Sc	Sc	3.382	0.497	Mg	Ca	Ca	Ca	Si	Si	Ti	Hf	4.463	0.925
Ca	Ba	Ba	Cd	Sn	Sn	Sn	Zr	2.406	0.319	Sr	Zn	Sn	Ti	Y	Y	Y	2.918	0.541	Sr	Sr	Sr	Ba	Ge	Zr	Hf	Hf	3.382	0.575	Be	Be	Mg	Mg	Si	Ge	Ge	Ti	4.463	0.558	
Mg	Cd	Sn	Sn	Al	Sc	Sc	Sc	2.407	0.920	Be	Be	Zn	Cd	Ge	Ge	Sn	2.918	0.761	Mg	Cd	Si	Si	In	Sc	Sc	Sc	3.383	0.431	Be	Be	Be	Mg	Si	Si	Ge	Ti	4.465	0.392	
Be	Be	Mg	Cd	Sn	Sn	Sn	Hf	2.407	0.367	Sr	Sr	Ge	Hf	Sc	Y	Y	2.918	1.000	Be	Be	Zn	Zn	Si	Zr	Zr	Hf	3.383	0.391	Mg	Ca	Ca	Ca	Si	Si	Ge	Zr	4.467	0.431	
Ba	Cd	Ti	Zr	Ga	Ga	Ga	Ga	2.407	0.295	Cd	Cd	Si	Ge	Al	Al	Sc	2.918	0.691	Be	Be	Ca	Ca	Si	Si	Sn	Hf	3.383	0.3											

Ca	Ba	Ba	Cd	Ge	Ge	Hf	Hf	2.418	0.254	Be	Sr	Hf	Hf	Al	Sc	Sc	Sc	2.925	1.179	Mg	Ca	Sr	Sr	Sn	Sn	Sn	Hf	3.392	0.179	Be	Mg	Mg	Mg	Si	Si	Ge	Zr	4.848	0.697
Sr	Zn	Zn	Zn	Si	Sn	Hf	Hf	2.418	0.176	Mg	Zn	Si	Si	In	In	Sc	Sc	2.925	0.854	Be	Be	Ca	Ba	Ge	Hf	Hf	Hf	3.392	0.410	Be	Mg	Mg	Ca	Si	Si	Si	Ti	4.851	0.853
Zn	Zn	Ge	Ge	Al	Ga	Ga	Sc	2.418	0.404	Cd	Cd	Si	Si	Al	Al	Ga	Sc	2.925	0.945	Be	Be	Sr	Sr	Sn	Ti	Ti	Hf	3.392	0.671	Be	Mg	Mg	Mg	Si	Si	Zr	Hf	4.855	0.707
Mg	Ba	Hf	Hf	Ga	Ga	In	In	2.418	0.172	Be	Be	Be	Ba	Sn	Sn	Ti	Zr	2.925	0.457	Be	Sr	Cd	Cd	Si	Si	Si	Ti	3.392	0.520	Be	Mg	Mg	Mg	Si	Ge	Ge	Ti	4.859	0.773
Sr	Sr	Hf	Hf	Ga	In	In	Sc	2.418	0.124	Mg	Ca	Ca	Cd	Ge	Ge	Zr	Zr	2.925	1.049	Sr	Sr	Sr	Sr	Si	Ge	Zr	Hf	3.393	0.426	Be	Mg	Mg	Mg	Si	Ge	Ti	Ti	4.953	0.825
Be	Ba	Ba	Cd	Ge	Ge	Zr	Zr	2.418	0.411	Ca	Ba	Hf	Hf	Al	Al	Sc	Sc	2.925	1.373	Ca	Sr	Ba	Ba	Ge	Ge	Hf	Hf	3.393	0.745	Be	Mg	Mg	Mg	Si	Si	Ti	Hf	4.991	0.644
Mg	Sr	Sr	Cd	Sn	Sn	Sn	Zr	2.418	0.154	Be	Be	Zn	Zn	Ge	Sn	Sn	Ti	2.925	0.210	Be	Be	Sr	Sr	Sn	Sn	Ti	Zr	3.393	0.574	Be	Mg	Mg	Mg	Si	Si	Ti	Zr	5.020	0.699
Sr	Zn	Ti	Ti	Ga	Ga	Y	Y	2.418	0.114	Sr	Sr	Si	Zr	Al	Al	Sc	Sc	2.925	0.153	Sr	Sr	Si	Ti	Sc	Sc	Y	Y	3.393	0.219	Be	Mg	Mg	Mg	Si	Si	Ge	Ti	5.056	0.634

Table S4 (f): 6 types of cations

Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)									
Mg	Ba	Sn	Sn	Ga	In	In	Y	0.292	-0.828	Sr	Ba	Ti	HF	Ga	In	In	2.237	0.402	Mg	Ba	Ti	Ti	Al	In	Sc	Sc	2.708	0.912	Mg	Ca	Sn	Ti	Sc	Y	Y	Y	3.139	0.585																					
Be	Ba	Sn	Sn	Ga	In	In	Y	0.326	-0.830	Ca	Sr	Ge	Ti	Al	Ga	Ga	2.238	0.446	Sr	Sr	Ge	Zr	Ga	Sc	Y	Y	2.708	1.142	Ca	Zn	Si	HF	Al	Y	Y	Y	3.139	0.646																					
Ba	Cd	Sn	Sn	Ga	In	In	Y	0.339	-0.828	Sr	Cd	Ti	HF	Ga	Ga	Y	Y	2.238	0.494	Sr	Sr	Ti	Ti	Al	Ga	Sc	Y	2.708	0.823	Mg	Zn	Si	HF	Ga	Ga	Sc	3.139	0.523																					
Mg	Ba	Ge	Sn	In	In	In	Y	0.369	-0.879	Ba	Cd	Zr	HF	Ga	Ga	Y	Y	2.238	0.402	Ca	Ca	Si	Zr	Al	Ga	Y	Y	2.708	0.886	Be	Ca	Cd	Cd	Ge	Ti	Ti	HF	3.139	0.787																				
Mg	Sr	Sn	Sn	Ga	In	In	Y	0.384	-0.885	Be	Sr	Ge	HF	Al	Ga	Ga	2.238	0.759	Mg	Zn	Ge	Sn	Ga	Sc	Sc	Sc	2.709	1.189	Sr	Ba	Zn	Zn	Ti	Zr	Zr	HF	3.139	0.772																					
Be	Ba	Ge	Sn	Ga	In	In	In	0.385	-0.814	Be	Ba	Si	Ti	In	In	Sc	Sc	2.238	0.774	Ca	Sr	Cd	Cd	Si	Si	Sn	Ti	2.709	0.867	Be	Be	Mg	Zn	Ge	Sn	HF	HF	3.139	0.630																				
Ba	Cd	Ge	Sn	Ga	In	In	In	0.389	-0.597	Ba	Zn	Cd	Cd	Ge	Ge	Ti	Zr	2.238	0.446	Sr	Cd	Ti	HF	In	Y	Y	Y	2.709	1.118	Be	Mg	Ca	Sr	Si	Si	Sn	Sn	3.139	0.550																				
Ba	Cd	Sn	Sn	Al	In	In	Y	0.392	-0.602	Be	Sr	Si	Si	Al	In	In	Sc	2.238	0.694	Sr	Ba	Ba	Cd	Cd	Ti	Zr	HF	HF	2.709	1.333	Be	Be	Sr	Ba	Si	Si	Ge	HF	3.139	0.499																			
Sr	Cd	Sn	Sn	Ga	In	In	Y	0.392	-0.527	Zn	Cd	Si	Ti	In	In	Y	Y	2.238	0.769	Mg	Ba	Ge	HF	Sc	Sc	Y	Y	2.709	0.838	Mg	Sr	Zn	Zn	Si	Ge	Ge	Zr	3.139	0.596																				
Be	Ba	Ge	Sn	In	In	In	Y	0.393	-0.567	Ba	Zn	Zn	Cd	Si	Si	Ge	Zr	2.238	0.435	Mg	Cd	Ge	Ge	Al	Sc	Y	Y	2.709	1.087	Be	Ca	Si	Si	Al	Al	In	Sc	3.139	0.598																				
Ba	Cd	Ge	Sn	In	In	In	Y	0.395	-0.556	Ba	Cd	Si	Ge	Al	Al	Al	Y	2.238	0.678	Ca	Ba	Ge	Zr	Ga	Y	Y	Y	2.709	1.400	Be	Be	Mg	Cd	Ge	Ti	Zr	Zr	3.139	0.654																				
Ba	Cd	Sn	Sn	Al	Ga	In	In	0.400	-0.561	Ba	Cd	Sn	HF	Ga	Y	Y	Y	2.239	0.766	Mg	Zn	Sn	Zr	Ga	Ga	Sc	Sc	2.709	0.644	Mg	Mg	Ba	Cd	Si	Si	Zr	HF	3.140	0.598																				
Mg	Ba	Sn	Sn	Al	Ga	In	Y	0.404	-0.494	Mg	Ca	Cd	Cd	Si	Sn	Sn	Zr	2.239	0.432	Ca	Ca	Ge	Ti	Al	Ga	Sc	Sc	2.709	0.715	Cd	Cd	Si	Zr	Al	Sc	Sc	Y	3.140	0.786																				
Ca	Ba	Sn	Sn	Ga	In	In	Y	0.420	-0.550	Be	Zn	Sn	Ti	Ga	Ga	In	In	2.239	0.680	Be	Ca	Ba	Zn	Sn	Sn	Sn	HF	2.709	0.852	Be	Be	Sn	Zr	Al	In	Sc	Sc	3.140	0.771																				
Sr	Cd	Ge	Sn	Ga	In	In	In	0.422	-0.540	Sr	Zn	Sn	HF	Al	Al	Sc	2.239	0.699	Be	Zn	HF	HF	In	Sc	Y	Y	2.709	1.176	Be	Be	Mg	Cd	Ti	Zr	Zr	HF	3.140	0.693																					
Sr	Cd	Sn	Sn	Al	Ga	In	In	0.438	-0.480	Mg	Zn	Ge	Sn	Ga	Ga	Sc	Sc	2.239	0.368	Mg	Sr	Ge	Zr	Al	Al	Al	Ga	2.709	1.098	Mg	Zn	Cd	Cd	Si	Sn	Ti	Ti	3.140	0.571																				
Be	Sr	Sn	Sn	Al	Ga	In	Y	0.444	-0.475	Ca	Ca	Zn	Cd	Si	Si	Sn	HF	2.239	0.666	Ca	Ba	Si	Zr	Al	Al	Al	In	2.709	1.051	Be	Ca	Ti	HF	Al	Ga	Ga	Ga	3.140	0.524																				
Mg	Ba	Ge	Sn	Ga	In	In	In	0.444	-0.474	Sr	Cd	HF	HF	Al	In	Y	Y	2.239	0.693	Mg	Ba	Ba	Zn	Si	Si	Ge	Sn	2.709	1.272	Be	Be	Sr	Zn	Sn	Ti	HF	HF	3.140	0.652																				
Ba	Cd	Ge	Sn	Al	In	In	In	0.446	-0.575	Mg	Sr	Ge	Zr	Ga	Ga	Y	Y	2.239	0.357	Zn	Zn	Sn	HF	Ga	Sc	Sc	Y	2.709	1.117	Be	Zn	Ge	Ti	Al	Ga	Ga	Ga	3.140	0.588																				
Sr	Ba	Sn	Sn	Ga	In	In	Y	0.448	-0.480	Sr	Ba	Sn	HF	In	Sc	Sc	Sc	2.240	0.829	Ca	Ba	Ba	Cd	Si	Si	Ti	HF	2.709	1.088	Cd	Cd	Si	Ti	Al	Sc	Y	Y	3.140	0.560																				
Sr	Cd	Sn	Sn	Al	Ga	In	Y	0.449	-0.483	Ba	Cd	Ge	Sn	Y	Y	Y	Y	2.240	0.834	Be	Sr	Zr	Zr	In	Sc	Y	Y	2.709	0.903	Ca	Ba	Ba	Zn	Ti	Zr	Zr	HF	3.140	0.802																				
Sr	Cd	Ge	Sn	In	In	In	Y	0.451	-0.296	Ba	Zn	HF	HF	Al	Ga	In	In	2.240	0.350	Be	Zn	HF	HF	Al	Y	Y	Y	2.709	0.942	Be	Mg	Zn	Cd	Ge	Ge	HF	3.141	0.545																					
Mg	Ba	Sn	Sn	Ga	In	In	Sc	0.454	-0.300	Be	Ba	Zn	Cd	Sn	Sn	Sn	Ti	2.240	0.806	Mg	Ba	Sn	Ti	Al	Sc	Sc	Sc	2.709	1.060	Ca	Cd	Ti	Zr	Zr	Al	Al	Sc	3.141	0.383																				
Ca	Sr	Sn	Sn	Ga	In	In	Y	0.456	-0.198	Ca	Zn	Si	Ti	Ga	Ga	In	In	2.240	0.820	Be	Sr	HF	HF	Ga	Ga	In	Sc	2.710	0.870	Ba	Zn	Zr	HF	Al	Al	Sc	Sc	3.141	0.331																				
Mg	Sr	Ge	Sn	In	In	In	Y	0.462	-0.162	Mg	Mg	Sn	HF	Ga	Ga	In	Y	2.240	0.587	Mg	Ba	Zr	Zr	Ga	Sc	Y	Y	2.710	0.932	Be	Sr	Ba	Zn	Si	Si	Zr	Zr	3.141	0.333																				
Be	Ba	Sn	Sn	Ga	In	In	Sc	0.474	-0.298	Mg	Ba	Si	Si	Ga	Ga	In	Sc	2.240	0.724	Be	Ba	Si	HF	Al	Y	Y	Y	2.710	1.126	Be	Be	Ca	Zn	Sn	Sn	Ti	HF	3.141	0.295																				
Ca	Ba	Sn	Sn	Al	In	In	Y	0.474	-0.302	Sr	Ba	Si	HF	Ga	Ga	Ga	In	2.240	0.809	Ca	Sr	Ba	Cd	Ge	Zr	Zr	Zr	2.710	1.239	Ca	Ca	Sr	Ba	Si	Ge	Sn	Sn	3.141	0.253																				
Be	Ba	Sn	Sn	Al	In	In	Y	0.476	-0.207	Mg	Ba	Ti	Zr	In	In	In	Sc	2.240	0.567	Be	Ba	Ge	Zr	Al	Sc	Sc	Sc	2.710	1.147	Be	Sr	Zn	Zn	Si	Ge	HF	HF	3.141	0.514																				
Sr	Ba	Sn	Sn	Al	In	In	Y	0.478	-0.184	Be	Ba	Ge	Ge	Al	Sc	Y	Y	2.241	0.705	Ca	Zn	Sn	Ti	Ga	Y	Y	Y	2.710	1.155	Be	Be	Zn	Cd	Ti	Zr	Zr	HF	3.141	0.364																				
Sr	Cd	Ge	Sn	Al	In	In	Y	0.485	-0.214	Cd	Cd	Ge	HF	Al	In	In	Sc	Sc	2.241	0.806	Mg	Sr	HF	HF	Al	Al	Ga	In	2.710	0.903	Be	Sr	Sr	Zn	Si	Ge	Ti	Ti	3.141	0.326																			
Ba	Zn	Sn	Sn	Ga	In	In	Y	0.485	-0.363	Ca	Sr	Si	Ge	Ga	Ga	Sc	Sc	2.241	0.563	Ca	Sr	Zn	Zn	Ge	Ge	Ti	Zr	2.710	0.961	Be	Be	Ba	Zn	Si	Ge	Zr	Zr	3.141	0.379																				
Ba	Cd	Sn	Sn	Ga	Ga	In	Y	0.488	-0.334	Ca	Cd	Si	HF	Ga	Ga	Ga	Y	2.241	0.693	Mg	Ca	Ti	HF	Ga	Ga	In	In	2.710	1.096	Ca	Sr	Si	Zr	Sc	Sc	Sc	Y	3.141	0.458																				
Be	Sr	Ge	Sn	Ga	In	In	In	0.494	-0.328	Cd	Cd	Sn	Zr	Al	Al	Sc	Y	2.241	0.723	Ca	Sr	HF	HF	In	Sc	Y	Y	2.710	0.907	Mg	Cd	Zr	Zr	Al	Al	Ga	Y	3.141	0.364																				
Mg	Sr	Sn	Sn	Al	In	In	Y	0.497	-0.351	Ba	Ba	Si	HF	Al	Al	Ga	Y	2.241	0.498	Mg	Ba	Zr	HF	In	In	Sc	Sc	Sc	2.710	0.955	Be	Zn	Sn	Ti	Sc	Y	Y	Y	3.141	0.573																			
Ba	Cd	Sn	Sn	Al	Ga	In	In	Sc	0.503	-0.351	Mg	Cd	Si	Ge	Ga	Ga	Y	2.241	0.677	Be	Ca	Sr	Zn	Ge	Ge	Ge	Sn	2.710	1.154	Ca	Ba	Ti	Ti	Al	Sc	Y	Y	3.141	0.543																				
Ca	Ba	Ge	Sn	In	In	In	Y																																																				

Ba	Cd	Si	Sn	In	In	In	Y	0.684	0.458	Ca	Cd	Si	Sn	Al	Al	Al	Ga	2.249	0.630	Ca	Sr	Si	Ti	Ge	Ga	Y	Y	2.717	0.960	Be	Mg	Sr	Ba	Sn	Sn	Sn	Ti	3.149	0.296	
Sr	Ba	Sn	Sn	Al	Ga	In	In	0.686	0.451	Mg	Sr	Sn	Zr	Al	Al	Al	In	2.249	0.761	Be	Sr	Ge	Cd	Si	Zr	Hf	Hf	2.717	1.074	Zn	Cd	Ti	Ti	Al	Ga	Sc	Sc	3.149	0.390	
Sr	Ba	Sn	Sn	Al	Ga	Ga	In	0.689	0.535	Sr	Cd	Si	Ti	Al	Ga	Ga	Ga	2.249	0.842	Mg	Ca	Ge	Hf	Al	Al	Al	Y	2.717	0.927	Mg	Sr	Zr	Hf	Al	Al	Al	Sc	3.149	0.355	
Sr	Ba	Ge	Sn	In	In	In	Sc	0.690	0.683	Sr	Ba	Ti	Zr	Al	In	In	In	2.250	0.599	Be	Mg	Mg	Cd	Ge	Sn	Sn	Hf	2.717	0.968	Mg	Sr	Ba	Zn	Ge	Ti	Hf	Hf	3.149	0.617	
Ca	Sr	Ge	Sn	Ga	Ga	In	In	0.690	0.497	Be	Zn	Sn	Sn	Ga	Ga	Sc	Y	2.250	0.728	Be	Sr	Sr	Cd	Si	Si	Sn	Ti	2.717	1.115	Mg	Ca	Zn	Cd	Ti	Ti	Hf	Hf	3.149	0.896	
Ba	Ba	Sn	Sn	Al	Ga	Ga	Y	0.690	0.488	Ca	Cd	Ge	Zr	Al	Al	Al	Ga	2.250	0.836	Be	Zn	Si	Hf	Ga	Ga	Y	Y	2.717	0.750	Be	Mg	Mg	Ti	Ge	Ga	Ga	In	3.149	0.745	
Ca	Ba	Sn	Sn	Al	Ga	Ga	Y	0.691	0.561	Ba	Zn	Cd	Cd	Si	Ge	Ge	Ti	2.250	0.593	Ba	Zn	Si	Zr	Ga	Y	Y	Y	2.717	0.783	Sr	Cd	Ti	Hf	Sc	Y	Y	Y	3.149	0.615	
Sr	Zn	Sn	Sn	Al	Ga	In	In	0.693	0.691	Be	Ca	Ge	Ge	Al	Ga	Ga	Sc	2.250	0.599	Be	Ba	Ti	Zr	Ga	Ga	Sc	Sc	2.717	0.861	Be	Zn	Si	Hf	Al	Al	Y	Y	3.149	0.959	
Zn	Cd	Sn	Sn	Ga	In	In	Y	0.694	0.723	Ca	Zn	Si	Hf	Ga	Ga	Y	Y	2.250	0.720	Mg	Ca	Ba	Zn	Sn	Sn	Sn	Zr	2.717	1.015	Mg	Sr	Si	Ti	Al	Al	Y	Y	3.150	0.789	
Be	Sr	Sn	Sn	Ga	Ga	In	Y	0.697	0.935	Be	Be	Ba	Cd	Si	Sn	Ti	Ti	2.250	0.624	Mg	Mg	Si	Zr	Al	In	In	Y	2.717	0.991	Be	Mg	Ca	Zn	Ge	Ge	Ge	Sn	3.150	0.410	
Sr	Cd	Si	Sn	Ga	In	In	In	0.699	0.896	Sr	Cd	Si	Si	Al	Ga	Y	Y	2.250	0.566	Mg	Ca	Si	Ge	In	Sc	Sc	Sc	2.717	0.940	Be	Cd	Zr	Al	Al	Al	Ga	Y	3.150	0.500	
Ca	Ba	Sn	Sn	Al	Ga	Ga	In	0.700	0.887	Be	Ca	Si	Sn	Sn	Sn	Sc	Sc	2.250	0.710	Be	Sr	Ti	Ti	Al	Al	Ga	In	2.717	1.115	Be	Ca	Ba	Zn	Si	Zr	Zr	Zr	3.150	0.522	
Mg	Ba	Sn	Sn	Ga	Ga	In	Sc	0.701	0.952	Sr	Sr	Zn	Zn	Ge	Sn	Zr	Hf	2.250	0.611	Ca	Ba	Ba	Cd	Si	Si	Ti	Zr	2.717	1.015	Mg	Zn	Ge	Hf	Al	Al	Al	Y	3.150	0.444	
Sr	Ba	Ge	Sn	Ga	Ga	In	In	0.704	0.935	Be	Ba	Sn	Ti	In	Sc	Sc	Sc	2.250	0.599	Mg	Sr	Zn	Cd	Ge	Ge	Ge	Zr	2.717	0.924	Zn	Cd	Ti	Hf	Al	Al	Sc	Sc	3.150	0.549	
Ca	Sr	Ge	Sn	In	In	In	Sc	0.705	0.952	Mg	Sr	Sn	Hf	Al	Al	Y	Y	2.250	0.621	Ca	Ba	Ti	Hf	Al	Al	Al	Y	2.717	0.923	Be	Ge	Ti	In	Sc	Y	Y	Y	3.150	0.772	
Sr	Ba	Sn	Sn	In	In	Sc	Y	0.705	1.087	Sr	Sr	Si	Ge	Al	Ga	Y	Y	2.250	0.519	Ca	Cd	Hf	Hf	Ga	In	Sc	Sc	2.718	0.874	Be	Mg	Hf	Hf	In	Sc	Y	Y	3.150	1.050	
Sr	Cd	Sn	Sn	Ga	In	Y	Y	0.706	1.072	Sr	Ba	Hf	Hf	Ga	In	In	Y	2.251	0.942	Mg	Zn	Ge	Sn	Al	Al	Sc	Sc	2.718	0.890	Be	Zn	Sn	Zr	Sc	Sc	Sc	Y	3.150	1.053	
Sr	Zn	Sn	Sn	Ga	Ga	In	Y	0.707	1.086	Ba	Ba	Cd	Cd	Ge	Ti	Zr	Hf	2.251	0.886	Cd	Cd	Si	Si	Al	Ga	Sc	Y	2.718	0.955	Be	Mg	Ge	Sn	Al	Sc	Sc	Sc	3.150	0.967	
Ca	Sr	Sn	Sn	Al	Ga	In	In	0.708	0.913	Cd	Cd	Si	Zr	In	In	Sc	Y	2.251	0.733	Mg	Mg	Zn	Cd	Sn	Si	Sn	Hf	2.718	0.874	Ca	Ba	Zn	Zn	Si	Zr	Zr	Hf	3.150	0.603	
Mg	Ba	Ge	Sn	Ga	Ga	In	In	0.710	1.249	Sr	Sr	Si	Zr	Al	Ga	In	In	2.251	0.758	Be	Sr	Sr	Cd	Si	Si	Sn	Hf	2.718	0.900	Be	Sr	Zn	Cd	Si	Zr	Zr	Zr	3.150	0.885	
Ba	Ba	Ge	Sn	Ga	In	In	Y	0.711	1.234	Sr	Sr	Zn	Zn	Si	Sn	Zr	Hf	2.251	0.858	Ca	Sr	Sr	Si	Si	Ge	Ti	Ti	2.718	1.094	Ca	Sr	Sr	Ba	Si	Ge	Sn	Sn	3.151	0.799	
Mg	Ba	Sn	Sn	Al	Ga	Ga	Y	0.712	1.238	Ba	Ba	Sn	Ti	Ti	Al	Sc	Y	2.251	0.697	Be	Ca	Ti	Zr	Ga	Y	Y	Y	2.718	1.000	Ca	Sr	Ba	Zn	Ge	Hf	Hf	Hf	3.151	0.580	
Sr	Cd	Sn	Sn	Ga	Ga	In	Sc	0.714	1.050	Zn	Zn	Ge	Sn	Al	Ga	Sc	Sc	2.252	0.722	Be	Mg	Sr	Cd	Sn	Sn	Zr	Zr	2.718	0.953	Ca	Zn	Ti	Hf	Al	Al	Al	Y	3.151	0.933	
Ba	Cd	Sn	Sn	Al	Ga	Ga	Y	0.719	1.177	Ca	Ba	Ti	Ti	Al	In	In	Y	2.252	0.852	Ca	Cd	Ge	Ti	In	Y	Y	Y	2.718	0.945	Mg	Sr	Ba	Zn	Sn	Hf	Hf	Hf	3.151	0.845	
Ba	Zn	Ge	Sn	In	In	In	Sc	0.719	1.224	Sr	Sr	Zn	Cd	Si	Ge	Ge	Ti	2.252	0.689	Ca	Sr	Zr	Zr	Al	In	Sc	Sc	2.718	0.847	Mg	Ca	Ti	Ti	Al	Al	Ga	Y	3.151	0.719	
Ca	Sr	Sn	Sn	In	In	Sc	Y	0.719	1.140	Mg	Ca	Ge	Ge	In	Sc	Sc	Y	2.252	0.577	Be	Sr	Sr	Cd	Si	Ge	Ti	Ti	2.718	0.889	Ca	Sr	Zn	Zn	Si	Ti	Ti	Zr	3.151	0.987	
Ba	Cd	Ge	Sn	In	In	Y	Y	0.720	1.125	Mg	Ca	Ge	Sn	Al	Al	Al	Sc	2.252	0.710	Sr	Ba	Zr	Hf	Ga	Ga	Sc	Sc	2.718	1.012	Mg	Ca	Ba	Zn	Ge	Ge	Zr	Zr	3.151	0.773	
Sr	Zn	Ge	Sn	Al	In	In	In	0.722	0.829	Be	Ba	Ti	Hf	Ga	Ga	In	In	2.252	0.714	Ca	Ba	Ba	Zn	Ga	Sn	Hf	Hf	2.718	0.849	Mg	Ba	Zn	Cd	Sn	Ti	Ti	Hf	3.151	0.709	
Ca	Ba	Ge	Sn	Al	In	In	In	0.724	0.806	Sr	Sr	Si	Ti	Ga	Ga	In	Y	2.252	0.541	Be	Sr	Ge	Zr	Al	Al	Al	Ga	2.718	0.890	Mg	Zn	Si	Si	In	Sc	Y	Y	3.151	1.054	
Be	Ba	Sn	Sn	Ga	Ga	In	Sc	0.727	0.711	Be	Ca	Sn	Ti	Ti	Ga	In	In	2.252	0.700	Sr	Cd	Si	Zr	Al	Al	Al	Sc	2.718	0.939	Be	Mg	Ba	Zn	Ge	Ge	Ge	Hf	3.151	0.819	
Ba	Zn	Sn	Sn	Ga	In	Y	Y	0.729	1.001	Mg	Ca	Sr	Cd	Si	Si	Sn	Sn	2.252	0.700	Ca	Cd	Sn	Hf	Al	Sc	Sc	Sc	2.718	0.997	Be	Zn	Zr	Zr	Ga	Sc	Sc	Y	3.151	0.500	
Ba	Zn	Sn	Sn	In	In	Sc	Y	0.731	0.964	Be	Sr	Ti	Ti	In	In	Sc	Y	2.253	0.572	Be	Ca	Sn	Ti	Al	Y	Y	Y	2.718	1.085	Zn	Zn	Si	Zr	In	Sc	Sc	Y	3.151	0.598	
Ca	Cd	Sn	Sn	Ga	Ga	In	Y	0.732	0.888	Be	Ba	Ge	Ge	Al	Al	Ga	Ga	2.253	0.596	Ba	Zn	Zn	Zn	Ge	Ti	Zr	Hf	2.718	0.987	Be	Mg	Zn	Zn	Ga	Sn	Zr	Zr	3.151	0.562	
Mg	Sr	Sn	Sn	Al	Ga	Ga	In	0.735	0.942	Mg	Cd	Ge	Ge	Al	Ga	Sc	Sc	2.253	0.600	Cd	Cd	Ge	Ti	Ga	Sc	Y	Y	2.718	0.996	Be	Be	Si	Zr	In	Sc	Y	Y	3.151	0.795	
Ba	Zn	Sn	Sn	Al	In	In	Sc	0.736	1.012	Be	Cd	Si	Ti	Al	In	In	In	2.253	0.603	Sr	Zn	Zr	Zr	Zr	Al	Al	Ga	Y	2.718	1.103	Mg	Cd	Ge	Hf	Ga	Sc	Sc	Sc	3.151	1.038
Mg	Ba	Si	Sn	Ga	In	In	In	0.736	0.991	Be	Ba	Sn	Hf	Al	Al	Sc	Sc	2.253	0.737	Mg	Zn	Ge	Hf	Al	Ga	Ga	Ga	2.718	0.786	Be	Ca	Cd	Cd	Ge	Ti	Ti	Zr	3.151	0.892	
Cd	Ge	Sn	Ga	In	In	Y	Y	0.737	0.893	Be	Sr	Ti	Ti	Ga	In	Y	Y	2.253	0.936	Ca	Cd	Sn	Zr	Sc	Sc	Sc	Y	2.718	0.812	Sr	Cd	Ti	Zr	Sc	Sc	Sc	Y	3.152	0.786	
Sr	Sr	Ge	Sn	Al	In	In	Y	0.738	0.934	Mg	Mg	Ge	Hf	Ga	In	In	Y	2.253	0.566	Be	Zn	Ge	Sn	Sc	Y	Y	Y	2.718	0.866	Be	Be	Ge	Hf	Ga	In	Sc	Sc	3.152	1.101	
Zn	Cd	Ge	Sn	Ga	Ga	In	In	0.739	0.908	Sr	Ba	Si	Zr	Zr	In	In	Sc	2.253	0.727	Zn	Zn	Si	Zr	Al	Al	In	Y	2.718	0.736	Be	Ba	Zn	Zn	Zr	Ga	Sc	Sc	3.152	0.935	
Ca	Cd	Sn	Sn	Ga	In	In	Sc	0.739	0.375	Be	Sr	Ba	Cd	Sn	Sn	Sn	Hf	2.253	0.922	Sr	Sr	Zn	Cd	Ti	Zr	Hf	Hf	2.719	0.585	Mg	Mg	Ti	Zr	In	In	In	Sc	3.152	0.607	
Ba	Cd	Si	Sn	Al	In	In	In	0.740	0.360	Mg	Zn	Ge	Ti	In	In	Y	Y	2.253	0.584	Be	Ba	Ba	Zn	Sn	Sn	Ti	Zr	2.719	0.316	Sr	Ba	Si	Hf	Sc	Y	Y	Y	3.152	0.702	
Sr	Cd	Si	Sn	In	In	In	Y	0.741	0.356	Ba	Ba	Zn	Zn	Si	Ge	Zr	Hf	2.253	0.608	Ca	Zn	Sn	Zr	Zr	In	Sc	Sc	2.719	1.033	Zn	Zn	Ge	Ti	Ga	Sc	Sc	Y	3.152	0.703	
Sr	Ba	Ge	Sn	Al	In	In	In	0.743	0.326	Be	Ca	Si	Zr	In	In	Y	Y	2.253	0.811	Ca	Zn	Zr	Zr	Al	Al	In	Y	2.719	0.813	Be	Be	Si	Zr	Ga	Ga	In	Y	3.152	0.641	
Be	Sr	Sn	Sn	Al	In	In	Sc	0.746	0.316	Sr	Zn	Ti	Ti	Ga	In	Y	Y	2.253	0.652	Mg	Ba	Cd	Cd	Ge	Ti	Zr	Zr	2.719	0.386	Be	Cd	Ge	Zr	Ga	Sc	Sc	Sc	3.152	0.751	
Mg	Ca	Ge	Sn	In	In	In	Y	0.747	0.394	Mg	Cd	Sn	Zr	Ga	Ga	Ga	Y	2.254	0.670	Mg	Ba	Si	Si	In	Sc	Y	Y	2.719	0.120	Zn	Cd	Cd	Cd	Si	Ti	Zr	Hf	3.152	0.950	
Ba	Cd	Ge	Sn	Ga	Ga	Ga	In	0.750	0.539	M																														

Ba	Zn	Sn	Sn	Al	In	Y	Y	0.858	1.151	Cd	Cd	Ti	Zr	Ga	In	Y	Y	2.260	0.958	Zn	Cd	Zr	Zr	Ga	Sc	Y	Y	2.724	0.299	Be	Ca	Si	Ti	Ga	Ga	Sc	Sc	3.161	0.700	
Zn	Cd	Sn	Sn	Ga	In	In	Sc	0.861	1.177	Be	Sr	Sn	Ti	Ga	Ga	Sc	Sc	2.260	1.062	Sr	Cd	Sn	Ti	Al	Sc	Sc	Sc	2.724	0.485	Mg	Ca	Si	HF	Ga	Ga	Sc	Sc	3.161	0.558	
Ca	Ge	Sn	Sn	In	In	In	Y	0.861	0.458	Sr	Ba	Cd	Cd	Sn	Ti	HF	HF	2.260	0.882	Be	Cd	Si	Sn	Sc	Sc	Y	Y	2.724	0.427	Mg	Ca	Cd	Cd	Si	Si	Zr	HF	3.161	0.475	
Mg	Ba	Sn	Sn	Al	Al	In	Y	0.862	0.452	Mg	Cd	Sn	Sn	Ga	Ga	Sc	Sc	2.261	0.928	Sr	Ba	Ba	Cd	Si	Si	Ge	HF	2.724	0.298	Be	Be	Be	Cd	Zn	Si	Ti	Zr	3.161	0.545	
Sr	Cd	Sn	Sn	Al	Al	In	Y	0.863	0.452	Sr	Zn	Sn	HF	In	Y	Y	Y	2.261	1.051	Mg	Ca	Ba	Cd	Si	Si	Si	Sn	2.725	0.686	Be	Ca	Zn	Cd	Ti	Ti	Zr	HF	3.161	0.509	
Ba	Ba	Sn	Sn	Ga	In	In	Sc	0.863	0.437	Ba	Cd	HF	HF	Al	Al	In	Y	2.261	0.868	Be	Be	Sn	Ti	Ga	In	In	Y	2.725	0.614	Be	Be	Zn	Cd	Si	Ti	Zr	Zr	3.161	0.478	
Ba	Zn	Si	Sn	Ga	In	In	In	0.864	0.431	Zn	Cd	Si	Ge	In	Y	Y	Y	2.261	1.018	Be	Be	Ca	Ba	Si	Si	Ge	Sn	2.725	0.352	Be	Ca	Zn	Sn	Sn	Ti	HF	3.161	0.563		
Ca	Ba	Sn	Sn	Ga	In	In	Sc	Y	0.864	Ca	Ba	Si	Zr	Ga	Ga	Ga	Y	2.261	1.036	Mg	Ba	Ti	Zr	Al	Ga	Ga	Ga	2.725	0.293	Be	Be	HF	Sr	Si	Si	Sn	HF	3.161	0.695	
Ca	Cd	Sn	Sn	Ga	In	Y	Y	0.867	0.732	Cd	Cd	Si	Ti	Ga	In	Y	Y	2.261	0.787	Sr	Ba	Ba	Cd	Si	Ti	Ti	Zr	2.725	0.365	Ca	Cd	Zr	HF	Al	Al	Al	Ga	3.161	1.229	
Be	Sr	Ge	Sn	In	In	Y	Y	0.868	0.727	Ca	Sr	Ge	Zr	Ga	Ga	Y	Y	2.261	1.339	Zn	Cd	Ti	HF	Al	Al	Y	Y	2.725	0.243	Mg	Cd	Ti	HF	Al	Y	Y	Y	3.161	1.239	
Mg	Cd	Sn	Sn	Ga	In	In	Y	0.872	0.845	Sr	Ba	Ba	Cd	Sn	Zr	HF	HF	2.261	1.369	Ba	Ba	Ti	HF	In	Sc	Y	Y	2.725	0.463	Be	Be	Ca	Cd	Ge	Ti	Zr	3.162	1.133		
Be	Ba	Sn	Sn	Al	Al	Ga	In	0.872	0.922	Mg	Mg	Si	Ge	Ga	In	Y	Y	2.261	1.163	Be	Be	Sn	Zr	Ga	Ga	In	Y	2.725	0.560	Be	Cd	Ti	Ti	Ga	Sc	Sc	Y	3.162	0.786	
Ba	Cd	Sn	Sn	Al	Ga	Ga	Sc	0.874	0.776	Ba	Cd	Si	Zr	Al	Al	Ga	Ga	2.261	1.173	Sr	Zn	HF	HF	Al	Ga	Ga	Sc	2.725	0.334	Mg	Mg	Ca	Cd	Si	Si	Sn	Ti	3.162	1.075	
Mg	Ba	Sn	Sn	Al	Ga	Ga	Sc	0.874	0.770	Be	Ba	Ti	HF	In	Y	Y	Y	2.261	1.339	Be	Sr	Ba	Cd	Cd	Si	Si	Ge	2.725	0.740	Mg	Mg	Mg	Cd	Si	Ge	Sn	Ti	3.162	0.968	
Ba	Cd	Sn	Sn	Ga	Ga	Sc	Y	0.875	0.880	Ca	Sr	Ge	HF	Al	Al	Ga	Ga	2.261	1.124	Be	Sr	Ba	Cd	Si	Si	Zr	Zr	2.725	0.711	Mg	Zn	Zn	Cd	Si	Ge	Zr	Zr	3.162	0.755	
Ba	Cd	Ge	Sn	Al	Al	In	In	0.875	0.943	Sr	Ba	Ge	HF	Al	In	In	In	2.261	1.140	Sr	Ba	Ba	Cd	Cd	Sn	Ti	Ti	HF	2.725	0.568	Be	Mg	Ca	Cd	Ge	Ge	Zr	Zr	3.162	1.130
Mg	Ba	Ge	Sn	Ga	Ga	Ga	Y	0.875	0.960	Sr	Ba	Sn	Zr	Al	Al	Sc	Sc	2.262	1.332	Ca	Zn	Zn	Zn	Si	Sn	Zr	HF	2.725	0.336	Sr	Zn	Si	Zr	Al	Sc	Sc	Sc	3.162	1.020	
Sr	Zn	Ge	Sn	In	In	Y	Y	0.875	0.209	Cd	Cd	Si	Ti	Al	In	In	Sc	2.262	1.117	Zn	Zn	Zn	Cd	Si	Sn	Zr	HF	2.725	0.413	Mg	Zn	Ti	Ti	Al	Ga	Ga	In	3.163	0.890	
Mg	Cd	Ge	Sn	Al	In	In	In	0.876	0.181	Sr	Sr	Zr	HF	In	In	Sc	Y	2.262	0.999	Mg	Ca	Cd	Cd	Si	Ge	Ge	Zr	2.725	0.405	Ca	Sr	Ba	Zn	Ge	Ge	Ti	Ti	3.163	1.160	
Mg	Ba	Ge	Sn	In	In	Y	Y	0.876	0.174	Mg	Zn	Ge	Zr	In	In	In	Sc	2.262	1.109	Ca	Sr	Zr	Zr	Al	Al	Ga	In	2.725	0.518	Be	Zn	Cd	Cd	Si	Ge	Ge	Zr	3.163	0.934	
Be	Cd	Ge	Sn	Ga	In	In	In	0.876	0.169	Sr	Ba	Ge	Ge	Ga	Sc	Y	Y	2.262	1.062	Zn	Cd	Si	Sn	Al	Ge	Sc	Sc	2.725	0.590	Be	Ca	Si	Ge	Sc	Sc	Sc	Y	3.163	0.873	
Sr	Cd	Ge	Ge	Ga	In	In	Y	0.877	0.153	Zn	Zn	Ge	Zr	Al	In	In	Sc	2.262	0.967	Mg	Sr	Zn	Cd	Cd	Ge	Ge	Ti	2.725	0.468	Zn	Cd	Si	HF	Al	Al	Al	Y	3.163	1.233	
Ca	Ca	Sn	Sn	Al	Ga	In	Y	0.877	0.143	Mg	Sr	Cd	Cd	Si	Sn	Zr	Zr	2.262	1.099	Sr	Ba	Ge	Ti	Al	Al	Sc	Sc	2.725	0.408	Be	Be	Mg	Zn	Si	Sn	HF	HF	3.163	0.986	
Be	Ca	Ge	Sn	Al	Ga	In	In	0.878	0.336	Sr	Cd	Zr	Zr	Ga	Ga	In	Y	2.262	1.047	Be	Ba	Cd	Cd	Cd	Sn	Ti	Zr	Zr	2.725	0.586	Mg	Zn	Zr	HF	Al	Y	Y	Y	3.163	0.606
Mg	Ca	Sn	Sn	Ga	In	In	Sc	0.878	0.321	Mg	Ba	Si	Ti	Al	In	In	Y	2.262	1.056	Sr	Zn	Ge	Ti	Al	Al	Al	Ga	2.725	0.712	Sr	Sr	Ba	Zn	Si	Si	Ge	Zr	3.163	0.718	
Ba	Cd	Ge	Sn	Ga	Ga	Ga	Y	0.880	0.304	Ba	Ba	Si	Si	Al	Ga	In	Sc	2.263	1.076	Sr	Ba	Zr	HF	In	Sc	Sc	Sc	2.725	0.560	Mg	Zn	Cd	Cd	Si	Si	Ge	HF	3.163	0.728	
Mg	Ba	Sn	Sn	Ga	In	In	Sc	0.880	0.162	Ba	Cd	Si	Si	Al	In	Sc	Sc	2.263	0.961	Zn	Cd	Ge	Ti	Ga	Ga	Sc	Sc	2.725	0.754	Be	Sr	Sr	Zn	Si	Ti	Zr	Zr	3.163	0.961	
Sr	Ba	Sn	Sn	Al	Al	Ga	Y	0.880	0.442	Ba	Zn	Zr	Zr	Ga	Ga	In	Y	2.263	1.023	Be	Ba	Cd	Cd	Si	Si	Sn	HF	2.725	0.789	Mg	Ca	Ti	Zr	Ga	Ga	Sc	Sc	3.163	1.205	
Mg	Ba	Si	Sn	Al	In	In	In	0.881	0.427	Ca	Zn	Sn	Ti	Ga	Ga	Ga	Sc	2.263	1.126	Ca	Zn	Zn	Cd	Ti	Ti	Zr	HF	2.725	0.454	Be	Ca	Zr	HF	Al	Ga	Ga	Ga	3.163	1.070	
Zn	Cd	Sn	Sn	Al	Ga	In	In	0.884	0.399	Mg	Ba	Ge	HF	Al	Al	Ga	Ga	2.263	1.311	Mg	Ba	Ge	Ti	Al	Al	Al	Sc	2.725	0.539	Mg	Ca	Cd	Cd	Zn	Zr	HF	HF	3.163	0.944	
Sr	Zn	Si	Sn	In	In	In	Y	0.884	0.239	Mg	Sr	Si	Sn	Al	Y	Y	Y	2.263	0.992	Mg	Ba	Ba	Cd	Si	Ge	Ge	HF	2.726	0.484	Sr	Si	Si	Ti	Sc	Sc	Sc	Y	3.163	1.273	
Be	Ba	Sn	Sn	Al	In	Y	Y	0.885	0.310	Zn	Zn	Ge	Zr	In	In	Sc	Y	2.263	1.116	Ca	Zn	Cd	Cd	Si	Si	Zr	HF	2.726	0.498	Ca	Cd	Ti	Ti	Sc	Sc	Sc	Y	3.163	1.119	
Sr	Ba	Sn	Sn	Al	Al	Ga	In	0.889	0.198	Sr	Zn	Si	Ge	In	Y	Y	Y	2.263	1.298	Ba	Cd	Si	Zr	Ge	Y	Y	Y	2.726	0.445	Ca	Sr	Sr	Zn	Si	Ge	Ti	Ti	3.163	0.707	
Zn	Cd	Sn	Sn	Ga	Al	In	Y	0.890	0.155	Be	Ba	Cd	Cd	Si	Sn	Sn	Zr	2.264	1.073	Sr	Ba	Ti	Zr	Al	Al	In	In	2.726	0.323	Be	Ca	Ca	Cd	Si	Ti	Ti	HF	3.163	0.815	
Sr	Ba	Sn	Sn	Al	Al	Ga	In	Y	0.892	0.147	Mg	Ca	Si	Ge	Ga	Ga	Y	Y	2.264	1.092	Be	Sr	Si	Si	Al	Ga	Y	Y	2.726	0.693	Sr	Ba	Ba	Zn	Si	Ti	Ti	HF	3.163	0.886
Ba	Zn	Sn	Sn	Al	Ga	Ga	Y	0.893	-0.002	Mg	Ca	Ge	Sn	Al	Y	Y	Y	2.264	1.209	Ba	Cd	Zr	Zr	In	Sc	Sc	Y	2.726	0.628	Mg	Cd	Si	In	In	Sc	Sc	Y	3.163	0.742	
Mg	Ba	Ge	Ge	Ga	In	In	Y	0.893	-0.020	Ba	Zn	Zr	Zr	In	In	Sc	Y	2.264	0.936	Sr	Zn	Ti	Ti	Al	Al	Ga	In	2.726	0.375	Mg	Zn	Zn	Cd	Ge	Sn	Ti	Ti	3.163	0.865	
Sr	Sr	Ge	Sn	Al	In	In	Sc	0.893	-0.054	Mg	Cd	Sn	Zr	Al	Ga	Ga	Ga	2.264	0.949	Be	Be	Sr	Cd	Sn	Si	Si	HF	2.726	0.325	Be	Mg	Ca	Zn	Sn	HF	HF	3.164	1.122		
Sr	Cd	Si	Sn	Ga	Ga	In	In	0.893	0.203	Zn	Cd	Si	Ge	Ga	Ga	Ga	Sc	2.264	0.874	Ca	Sr	Zn	Cd	Si	Si	Si	Ge	2.726	0.399	Be	Be	Ca	Ba	Si	Si	Sn	Ti	3.164	0.754	
Ca	Zn	Sn	Sn	Al	Ga	In	In	0.895	0.186	Sr	Zn	Ge	Ti	Ga	Ga	Sc	Sc	2.264	0.959	Mg	Sr	Zr	Zr	Al	Ga	Ga	Y	Y	2.726	0.275	Be	Mg	Ba	Ba	Si	Sn	Sn	Zr	3.164	0.765
Sr	Cd	Si	Sn	In	In	In	Sc	0.896	0.149	Sr	Zn	Ge	HF	Al	Al	In	In	2.264	0.941	Be	Mg	Si	Zr	In	In	Y	Y	2.726	0.492	Ca	Sr	Sr	Zn	Ge	Ti	HF	HF	3.164	0.681	
Ba	Cd	Sn	Sn	Al	Ga	Y	Y	0.896	0.120	Zn	Zn	Sn	HF	Ga	Ga	Sc	Y	2.264	0.807	Ca	Ba	Zr	Zr	In	Sc	Y	Y	2.726	0.591	Mg	Mg	Sr	Cd	Ge	Ge	Ti	HF	3.164	0.505	
Sr	Cd	Sn	Sn	Al	Al	Ga	In	0.896	0.264	Ba	Cd	Sn	Zr	In	Sc	Sc	Sc	2.264	1.024	Ca	Ba	Ti	Zr	In	Y	Y	Y	2.726	0.367	Be	Sr	Sr	Zn	Si	Zr	Zr	HF	3.164	0.679	
Sr	Ba	Ge	Sn	Ga	Ga	Ga	Y	0.897	0.247	Be	Sr	Cd	Cd	Ge	Sn	Sn	HF	2.265	1.041	Ca	Sr	Zr	Zr	Al	Ga	Y	Y	2.726	0.743	Mg	Ca	Zn	Cd	Si	Zr	Zr	Zr	3.164	0.592	
Cd	Cd	Ge	Sn	Ga	In	In	Sc	0.898	0.200	Ba	Ca	Si	Ge	Al	Al	Ga	Ga	2.265	0.919	Ca	Ba	HF	HF	Ga	Sc	Sc	Y	2.726	0.717	Ca	Sr	Sr	Zn	Si	Ti	HF	HF	3.164	0.519	
Ba	Ba	Ge	Sn	Al	In	In	Sc	0.89																																

Mg	Sr	Si	Sn	Al	In	In	In	0.966	0.704	Ba	Ba	Si	Ge	Al	Ga	Sc	Sc	2.270	0.806	Cd	Cd	Zr	Hf	Al	Sc	Y	Y	2.732	0.333	Be	Ca	Ca	Cd	Si	Ge	Ge	Ti	3.171	0.825	
Ba	Ba	Ge	Sn	Al	Ga	Ga	In	0.968	0.978	Ca	Ca	Sn	Ti	Al	In	Sc	Sc	2.271	0.894	Ca	Ca	Zn	Cd	Ge	Ti	Ti	Zr	2.732	0.446	Be	Cd	Si	Hf	Al	Al	Al	In	3.171	0.971	
Sr	Cd	Sn	Sn	Al	Ga	Y	Y	0.969	0.957	Ca	Ba	Sn	Hf	Al	Al	Sc	Sc	2.271	1.274	Zn	Zn	Ge	Ge	Ti	Al	Ga	Ga	Sc	0.333	0.2732	Ca	Cd	Si	Zr	Al	Y	Y	3.171	0.975	
Ca	Sr	Sn	Sn	Al	Al	Ga	In	0.969	0.870	Mg	Ca	Sn	Ti	Ga	Ga	Y	Y	2.271	1.226	Ca	Zn	Sn	Ti	Al	Al	Sc	Sc	2.732	0.475	Mg	Ca	Ge	Zr	Sc	Sc	Y	Y	3.171	0.879	
Sr	Sr	Ge	Sn	Al	Ga	Ga	In	0.969	0.852	Mg	Cd	Ge	Ti	Al	Al	In	In	2.271	1.118	Be	Sr	Si	Hf	Al	Al	Ga	Ga	2.732	0.638	Be	Ca	Cd	Cd	Si	Zr	Zr	Hf	3.171	0.717	
Sr	Cd	Ge	Ge	Al	In	In	Y	0.969	1.060	Sr	Ba	Zn	Cd	Ge	Ge	Ge	Ti	2.271	1.047	Sr	Cd	Hf	Hf	Ga	Sc	Y	Y	2.732	0.430	Ca	Ca	Ba	Zn	Si	Ge	Ge	Hf	3.171	0.882	
Ba	Ba	Ge	Sn	Al	In	In	Sc	Y	0.972	1.039	Be	Sr	Si	Hf	In	In	Sc	2.271	1.192	Be	Zn	Zr	Hf	Ga	Ga	Y	Y	2.732	0.820	Sr	Ca	Ba	Zn	Ti	Zr	Hf	Hf	3.172	0.782	
Ca	Sr	Ge	Sn	Ga	Ga	Ga	In	Y	0.943	Ca	Ba	Ge	Zr	Al	Al	Ga	Ga	2.271	1.077	Be	Ca	Sn	Zr	Zr	Al	Ga	Sc	2.732	0.800	Be	Ca	Ca	Cd	Si	Ti	Ti	Zr	3.172	0.717	
Mg	Cd	Sn	Sn	Al	In	In	Y	0.974	0.909	Ca	Ba	Ti	Zr	In	In	Sc	Sc	2.271	1.004	Be	Ba	Zr	Zr	Al	Ga	Ga	Y	2.732	0.665	Be	Be	Sr	Zn	Si	Ti	Zr	Zr	3.172	0.953	
Ca	Zn	Sn	Sn	Ga	In	In	Sc	0.974	0.955	Sr	Cd	Zr	Hf	Al	Al	In	In	2.271	1.184	Sr	Sr	Ti	Zr	In	Sc	Sc	Y	2.732	0.370	Be	Mg	Zn	Cd	Ge	Ge	Ge	Zr	3.172	0.850	
Be	Cd	Sn	Sn	Al	Ga	In	In	0.974	0.195	Ca	Cd	Sn	Ti	Al	Al	Y	Y	2.271	1.069	Mg	Mg	Zn	Cd	Si	Sn	Zr	Zr	2.732	0.509	Be	Be	Mg	Cd	Si	Si	Sn	Ti	3.172	0.794	
Ba	Cd	Si	Ge	In	In	In	Y	0.974	0.167	Ca	Ba	Zr	Hf	In	In	Y	Y	2.271	0.810	Be	Sr	Sr	Ge	Sn	Hf	Hf	2.732	0.502	Be	Mg	Sn	Hf	Al	Al	Sc	Sc	3.172	0.930		
Mg	Ba	Ge	Sn	In	In	Sc	Sc	0.976	0.160	Ba	Cd	Ti	Zr	Ga	Ga	Y	Y	2.272	0.986	Mg	Zn	Hf	Hf	Al	In	In	Y	2.732	0.524	Ca	Ca	Ba	Ba	Ge	Sn	Ti	Ti	3.172	0.753	
Be	Sr	Sn	Sn	Al	In	Y	Y	0.978	0.117	Be	Sr	Zn	Cd	Ga	Sn	Hf	Hf	2.272	1.100	Ba	Ba	Si	Ti	Al	In	Ga	Y	2.732	0.682	Be	Mg	Ba	Ba	Ge	Sn	Sn	Hf	3.172	0.806	
Ba	Zn	Ge	Sn	Ga	Ga	Ga	In	0.979	0.101	Sr	Ba	Zr	Hf	In	In	Sc	Sc	2.272	0.766	Sr	Sr	Zn	Cd	Ti	Zr	Zr	Hf	2.732	0.572	Ca	Zn	Ge	Ti	Ga	Sc	Sc	Sc	3.172	1.040	
Be	Sr	Sn	Sn	Ga	Ga	In	Sc	0.979	0.104	Ba	Bzn	Zr	Zr	Al	In	Y	Y	2.272	0.975	Be	Mg	Ge	Ge	Al	Al	In	Y	2.733	0.445	Mg	Mg	Ti	Hf	Al	Al	In	Y	3.172	0.820	
Ca	Sr	Si	Sn	Ga	In	In	Sc	0.980	0.291	Be	Ca	Sn	Zr	In	Y	Y	Y	2.272	1.084	Mg	Ba	Zr	Hf	Al	Ga	Ga	Ga	2.733	0.673	Zn	Zn	Si	Hf	Al	Al	Ga	Sc	3.172	0.533	
Ba	Cd	Ge	Ge	Ga	In	In	Sc	0.981	0.276	Mg	Sr	Sn	Zr	In	Y	Y	Y	2.272	0.731	Zn	Cd	Sn	Hf	Ga	Sc	Sc	Sc	2.733	0.795	Be	Be	Zr	Zr	Ga	In	Sc	Y	3.172	0.625	
Mg	Cd	Ge	Sn	Ga	In	In	Sc	0.981	0.271	Ca	Sr	Si	Ge	Al	Al	Al	In	2.272	0.762	Be	Ba	Ba	Cd	Ge	Ti	Zr	Hf	Hf	2.733	0.568	Ca	Zn	Ti	Ti	In	Sc	Sc	Y	3.172	0.680
Ca	Sr	Sn	Sn	Al	Al	Ga	Y	0.982	0.294	Ca	Zn	Ge	Zr	Al	Ga	Ga	Ga	2.272	0.947	Ca	Sr	Si	Ge	Al	Y	Y	Y	2.733	0.837	Ca	Sr	Ba	Zn	Ge	Zr	Zr	Zr	3.172	0.775	
Ba	Cd	Ge	Sn	Al	Ga	Ga	In	0.982	0.350	Ba	Ba	Si	Hf	Al	Al	In	Y	2.272	0.829	Mg	Mg	Ba	Cd	Si	Si	Ge	Sn	2.733	0.878	Mg	Cd	Ge	Hf	Sc	Y	Y	Y	3.172	0.793	
Ba	Ba	Ge	Sn	Al	Ga	Ga	In	0.983	0.334	Sr	Cd	Ge	Hf	Al	Al	Sc	Sc	2.272	1.006	Be	Cd	Si	Ge	Al	Y	Y	Y	2.733	0.476	Be	Be	Ca	Zn	Sn	Sn	Ti	Zr	3.173	0.908	
Be	Ca	Sn	Sn	In	In	Sc	Y	0.983	0.316	Be	Zn	Ge	Zr	In	In	In	Y	2.272	1.252	Sr	Sr	Ba	Zn	Ge	Sn	Hf	Hf	2.733	0.584	Zn	Zn	Si	Zr	Al	Al	Sc	Y	3.173	0.787	
Be	Ca	Sn	Sn	Ga	In	In	Sc	0.983	0.317	Mg	Ba	Cd	Cd	Ge	Ge	Sn	Zr	2.272	0.785	Be	Mg	Si	Hf	Ga	In	In	In	2.733	0.539	Be	Ba	Ba	Zn	Ti	Zr	Zr	Hf	3.173	0.993	
Sr	Ba	Sn	Sn	Ga	In	Y	Y	0.984	0.371	Sr	Sr	Zr	Hf	Ga	In	In	Y	2.272	0.995	Be	Be	Sr	Cd	Si	Si	Ge	Hf	2.733	0.589	Ca	Zn	Ti	Hf	Al	Y	Y	Y	3.173	0.858	
Sr	Sr	Si	Sn	Ga	In	In	Y	0.984	0.033	Be	Sr	Ba	Cd	Cd	Ge	Ge	Sn	Hf	2.273	1.237	Ca	Sr	Ti	Hf	In	Y	Y	Y	2.733	0.519	Mg	Mg	Zn	Cd	Si	Ti	Hf	Hf	3.173	0.544
Ca	Cd	Ge	Sn	Ga	Ga	Ga	In	0.984	0.016	Ca	Ba	Zn	Cd	Ge	Ge	Ge	Hf	2.273	0.739	Mg	Sr	Sr	Cd	Si	Si	Sn	Zr	2.733	0.403	Mg	Zn	Hf	Hf	Al	Sc	Y	Y	3.173	0.631	
Sr	Ba	Si	Sn	In	In	In	Sc	0.985	0.014	Be	Mg	Ba	Zn	Ge	Sn	Sn	Sn	2.273	0.771	Be	Zn	Ge	Ge	Al	Al	In	Sc	2.733	0.774	Mg	Ca	Sr	Cd	Zr	Zr	Hf	Hf	3.173	0.735	
Ba	Ba	Zn	Sn	Al	Ga	Y	Y	0.985	-0.070	Ca	Cd	Si	Si	Al	In	Y	Y	2.273	1.087	Be	Cd	Si	Ge	Ga	Ga	Sc	Sc	2.733	0.702	Be	Mg	Sr	Sr	Si	Ge	Ge	Sn	3.173	0.545	
Be	Sr	Sn	Sn	Al	Ga	Ga	Y	0.985	-0.080	Ca	Cd	Si	Ti	Ga	Ga	Ga	In	2.273	0.860	Ca	Ba	Zn	Cd	Si	Si	Hf	Hf	2.733	0.463	Be	Be	Ge	Zr	Ga	In	Ga	In	3.173	0.648	
Sr	Zn	Sn	Sn	Al	Ga	Ga	Y	0.985	-0.043	Ca	Zn	Ti	Hf	Ga	In	In	In	2.273	0.885	Be	Ba	Ti	Zr	Al	Al	Y	Y	2.733	0.364	Sr	Ba	Ba	Zn	Si	Ti	Ti	Zr	3.173	0.913	
Mg	Ca	Ge	Sn	Al	In	In	In	0.985	0.227	Mg	Ca	Zn	Cd	Sn	Zr	Ga	Hf	Hf	2.273	0.959	Zn	Zn	Ti	Zr	Al	Ga	Y	Y	2.733	0.478	Be	Mg	Si	Ti	In	Y	Y	Y	3.173	0.929
Be	Sr	Sn	Sn	Al	In	Sc	Sc	0.986	0.218	Zn	Zn	Ge	Hf	Al	Ga	Y	Y	2.273	0.875	Ca	Ca	Zr	Hf	Al	Al	In	Y	2.733	0.364	Mg	Cd	Hf	Hf	Al	Ga	Ga	Sc	3.173	0.936	
Mg	Sr	Ge	Ge	Ga	In	In	Y	0.986	0.255	Ba	Si	Si	Zr	Al	Ga	Sc	Sc	2.273	0.865	Mg	Ca	Zn	Zn	Si	Sn	Sn	Zr	2.733	0.502	Be	Zn	Ge	Ti	Al	Y	Y	Y	3.173	0.863	
Sr	Cd	Sn	Sn	Ga	In	Sc	Sc	0.987	0.225	Be	Sr	Cd	Cd	Ge	Sn	Sn	Zr	2.273	0.762	Be	Zn	Sn	Zn	Zr	Ga	Ga	Ga	Y	2.733	0.667	Be	Be	Mg	Cd	Ti	Ti	Zr	Hf	3.174	0.800
Sr	Ba	Si	Sn	Ga	In	In	In	0.988	0.273	Ba	Cd	Hf	Hf	Al	Ga	Y	Y	2.274	0.947	Be	Ba	Cd	Cd	Si	Si	Sn	Zr	2.734	0.461	Mg	Mg	Mg	Cd	Si	Sn	Ti	Zr	3.174	0.897	
Sr	Cd	Si	Ge	Ga	In	In	In	0.988	0.264	Zn	Cd	Ge	Zr	In	In	Sc	Sc	2.274	0.961	Be	Ba	Zn	Zn	Ge	Sn	Sn	Ti	2.734	0.821	Zn	Zn	Si	Ti	Ga	Sc	Y	Y	3.174	0.820	
Mg	Sr	Ge	Sn	Ga	Ga	Ga	Y	0.989	0.292	Mg	Cd	Si	Zr	Ga	Ga	In	In	2.274	0.854	Ca	Ca	Sr	Cd	Si	Sn	Ti	Ti	2.734	0.804	Be	Be	Sn	Zr	Ga	Sc	Sc	Y	3.174	0.806	
Ba	Ba	Zn	Sn	Ga	Ga	Ga	Y	0.990	0.246	Zn	Cd	Ge	Sn	Al	Al	Sc	Sc	2.274	0.781	Be	Be	Ge	Zr	Ga	Ga	In	Y	2.734	0.671	Mg	Mg	Ba	Zn	Ge	Sn	Hf	Hf	3.174	0.975	
Cd	Cd	Ge	Sn	Al	In	In	Sc	0.990	0.311	Sr	Ba	Sn	Ti	Al	Al	Ga	Ga	2.274	0.920	Sr	Sr	Ba	Zn	Si	Sn	Zr	Zr	2.734	0.397	Ca	Sr	Ba	Zn	Sn	Zr	Zr	Zr	3.175	0.895	
Ba	Cd	Sn	Sn	Al	Al	Ga	Y	0.990	0.104	Ca	Ca	Zn	Cd	Ge	Ge	Sn	Ti	2.274	0.815	Be	Zn	Ge	Ge	Al	In	Sc	Sc	2.734	0.530	Ca	Ca	Sr	Zn	Sn	Sn	Ti	Ti	3.175	0.861	
Ba	Cd	Ge	Ge	Ga	Ga	In	Y	0.993	0.097	Sr	Zn	Cd	Cd	Si	Si	Ge	Hf	2.274	0.750	Be	Ba	Hf	Hf	Al	Al	In	Sc	Y	2.734	0.517	Ca	Cd	Ti	Zr	In	Sc	Sc	Sc	3.175	0.949
Ca	Ba	Ge	Ge	Ga	In	In	Y	0.993	0.095	Ba	Cd	Hf	Hf	Al	Ga	In	Ga	2.274	0.912	Mg	Ca	Ti	Ti	Ga	In	In	Sc	2.734	0.546	Be	Be	Ca	Zn	Si	Zr	Zr	Hf	3.175	0.788	
Ba	Cd	Si	Sn	In	In	Y	Y	0.993	0.067	Zn	Zn	Sn	Ti	Al	Ga	Y	Y	2.274	0.807	Sr	Ba	Ba	Cd	Sn	Ti	Ti	Zr	2.734	0.701	Be	Ba	Cd	Cd	Ti	Zr	Hf	Hf	3.175	0.879	
Mg	Ca	Sn	Sn	Al	In	In	Sc	0.993	0.059	Ca	Ca	Ge	Ti	Al	Ga	Ga	In	2.274	1.131	Sr	Zn	Sn	Ti	Sc	Sc	Y	Y	2.734	0.588	Be	Zn	Ge	Hf	Al	Al	Al	In	3.175	1.046	
Be	Ba	Sn	Sn	Al	Ga	Ga</																																		

Sr	Ba	Sn	Sn	Ga	Ga	Sc	Y	1.057	0.845	Ca	Ba	Sn	Hf	In	Sc	Sc	Sc	2.282	0.904	Sr	Zn	Ti	Zr	Ga	Ga	Sc	Sc	2.739	0.918	Be	Be	Si	Ge	Ga	Ga	In	Sc	3.183	0.609	
Mg	Sr	Sn	Sn	Al	Al	Ga	Y	1.058	0.721	Be	Ca	Ge	Ge	Al	Al	Ga	Y	2.282	0.932	Sr	Sr	Ba	Zn	Si	Sn	Sn	Hf	2.739	0.782	Be	Ca	Zn	Zn	Ge	Ge	Sn	Ti	3.183	0.673	
Zn	Cd	Ge	Ge	Al	Al	Ga	In	1.058	0.815	Ba	Zn	Si	Ge	Al	Al	In	2.282	1.114	Be	Ba	Zn	Si	Al	Al	Al	Sc	2.739	0.466	Mg	Mg	Ba	Zn	Si	Zr	Zr	3.183	0.652			
Zn	Cd	Si	Sn	Al	Al	In	Y	1.058	0.763	Be	Mg	Sn	Ti	In	In	Y	2.282	0.894	Mg	Zn	Ti	Al	Ga	Ga	Ga	2.739	0.647	Mg	Cd	Hf	Hf	Al	Ga	Sc	Sc	3.183	0.675			
Ba	Zn	Si	Sn	In	In	Y	Y	1.058	0.744	Ca	Ba	Zn	Cd	Si	Ge	Ge	2.282	0.844	Be	Ca	Ti	Ti	Ga	In	In	Sc	2.739	0.626	Mg	Cd	Cd	Cd	Si	Ge	Ti	Zr	3.183	0.741		
Zn	Cd	Sn	Sn	Ga	Ga	In	Sc	1.059	0.738	Sr	Sr	Si	Hf	Ga	In	Y	2.282	0.945	Ca	Cd	Ge	Zr	Ga	Y	Y	2.739	0.581	Be	Be	Sr	Zn	Si	Ge	Ge	Ti	3.183	0.623			
Ba	Cd	Sn	Hf	Ga	In	In	In	1.059	0.681	Be	Mg	Sn	Hf	Ga	In	In	2.282	0.842	Be	Cd	Si	Hf	Al	Al	In	In	2.739	0.806	Ca	Sr	Ba	Zn	Ti	Ti	Zr	3.183	0.698			
Sr	Cd	Si	Sn	In	In	Y	Y	1.059	0.665	Mg	Ba	Si	Hf	Ga	Ga	Y	2.282	0.811	Be	Cd	Si	Ti	Ga	Ga	Ga	In	2.739	0.686	Ca	Cd	Zr	Zr	Al	Sc	Sc	Y	3.184	0.796		
Sr	Sr	Si	Sn	Al	Al	In	Y	1.060	0.606	Be	Be	Sn	Sn	Al	Ga	In	2.283	0.933	Be	Zn	Ge	Zr	In	Y	Y	2.739	0.524	Ca	Sr	Ba	Zn	Si	Zr	Zr	3.184	0.697				
Ba	Cd	Ge	Ge	Al	In	Sc	Y	1.060	0.795	Ca	Ba	Zn	Cd	Si	Si	Sn	2.283	0.825	Mg	Zn	Si	Zr	Al	Al	Y	Y	2.739	0.777	Be	Zn	Ti	Ti	Al	Al	In	Y	3.184	0.602		
Ca	Cd	Sn	Sn	Al	Al	In	Y	1.060	0.780	Be	Mg	Ge	Ge	Al	Y	Y	2.283	0.930	Be	Cd	Ge	Ge	Al	Al	Sc	Y	2.739	0.886	Mg	Mg	Ca	Cd	Sn	Zr	Zr	Hf	3.184	0.646		
Be	Cd	Sn	Ga	Ga	In	In	Y	1.062	0.709	Sr	Cd	Ge	Ge	Al	Sc	Y	2.283	0.948	Be	Cd	Sn	Ti	Ga	Al	Sc	Y	2.739	0.610	Be	Mg	Si	Sn	Sc	Sc	Y	Y	3.184	0.609		
Be	Sr	Si	Sn	Ge	Ga	In	In	1.062	0.627	Ca	Zn	Zn	Cd	Si	Si	Sn	Hf	2.283	0.747	Be	Zn	Ge	Zr	In	In	Sc	Sc	2.740	0.928	Mg	Mg	Zr	Hf	Al	Al	In	Y	3.184	0.626	
Sr	Cd	Ge	Ge	Ga	Ga	In	Y	1.063	0.894	Sr	Ba	Ge	Zr	Ga	Ga	Sc	2.283	0.889	Be	Be	Sr	Ba	Si	Sn	Sn	Hf	2.740	0.960	Be	Mg	Mg	Zr	Cd	Si	Ti	Ti	3.184	0.670		
Ba	Zn	Sn	Sn	Ga	In	Sc	Sc	1.064	0.878	Cd	Cd	Ti	Hf	Ga	Ga	In	Y	2.283	0.984	Ca	Ca	Ti	Hf	Ga	Ga	Sc	Y	2.740	0.533	Mg	Zn	Ge	Zr	Al	Y	Y	Y	3.184	0.554	
Ca	Cd	Ge	Ge	Ga	In	In	Y	1.065	0.797	Be	Zn	Ge	Ge	Al	In	In	Sc	2.284	1.119	Be	Ba	Ba	Zn	Si	Sn	Ti	Ti	2.740	0.667	Be	Cd	Ti	Zr	Ga	Ga	Sc	Sc	3.184	0.650	
Ca	Ca	Ge	Sn	Ga	Ga	In	Y	1.066	0.696	Zn	Cd	Sn	Hf	Al	Al	Al	In	2.284	0.858	Ca	Sr	Sr	Cd	Ge	Zr	Hf	Hf	2.740	0.624	Mg	Zn	Si	Sn	Sc	Sc	Sc	Y	3.184	0.721	
Ca	Ba	Sn	Sn	Al	Al	Ga	Sc	1.066	0.780	Be	Zn	Ge	Sn	Al	Ga	Ga	2.284	0.973	Mg	Cd	Zr	Zr	Ga	Ga	In	Y	2.740	0.566	Be	Ca	Si	Ge	Al	Al	Al	Sc	3.184	0.585		
Sr	Cd	Sn	Sn	Al	Al	Ga	Y	1.066	0.582	Ba	Ba	Cd	Cd	Si	Sn	Sn	Ti	2.284	1.104	Mg	Zn	Hf	Hf	Al	Ga	In	In	2.740	0.520	Be	Mg	Cd	Cd	Ge	Ti	Hf	Hf	3.184	0.583	
Ca	Sr	Si	Sn	Al	In	In	In	1.067	0.566	Ba	Cd	Cd	Cd	Sn	Ti	Zr	Zr	2.284	0.967	Zn	Zn	Zr	Hf	In	Sc	Y	Y	2.740	0.383	Be	Ca	Ca	Cd	Ti	Zr	Hf	Hf	3.184	0.622	
Mg	Cd	Sn	Sn	Ga	Ga	In	Y	1.067	0.560	Sr	Zn	Zr	Zr	Ga	In	Y	Y	2.284	0.985	Sr	Cd	Hf	Hf	In	Sc	Sc	Y	2.740	0.745	Sr	Ba	Ba	Zn	Sn	Ti	Ti	Hf	3.184	0.547	
Ba	Zn	Ge	Sn	Ga	Ga	Y	Y	1.067	0.531	Be	Mg	Ba	Cd	Sn	Sn	Sn	Hf	2.284	1.023	Ca	Ca	Ca	Cd	Si	Ge	Zr	Hf	2.740	0.699	Be	Mg	Zn	Zr	In	Sc	Sc	Sc	3.184	0.550	
Be	Sr	Ge	Sn	In	In	Sc	Sc	1.068	0.515	Be	Ca	Cd	Cd	Cd	Sn	Ti	Zr	2.284	0.825	Ca	Zn	Cd	Cd	Ge	Ti	Hf	Hf	2.740	0.407	Be	Be	Zn	Cd	Si	Sn	Ti	Ti	3.184	0.603	
Ba	Ba	Si	Sn	Al	In	In	Y	1.068	0.466	Sr	Cd	Si	Si	Al	Ga	Ga	Sc	2.284	0.837	Ca	Sr	Ti	Ti	Al	Ga	Ga	Sc	2.741	0.371	Be	Zn	Ge	Zr	Sc	Y	Y	Y	3.184	0.692	
Sr	Sr	Ge	Sn	Ga	Ga	In	Sc	1.069	0.636	Ba	Zn	Si	Ge	Ge	Y	Y	Y	2.284	0.733	Ca	Sr	Sn	Hf	Sc	Y	Y	Y	2.741	0.444	Zn	Cd	Ti	Hf	Al	Al	Al	Ga	3.185	0.768	
Ca	Ba	Ge	Sn	In	In	Y	Y	1.069	0.621	Ca	Sr	Ti	Hf	In	In	Y	Y	2.284	0.515	Ba	Zn	Ti	Hf	Al	Al	Al	Y	2.741	0.290	Ca	Ba	Ti	Zr	Sc	Y	Y	Y	3.185	0.718	
Sr	Ba	Ge	Ge	Al	In	In	Y	1.069	0.560	Be	Sr	Ge	Ge	Al	Al	Sc	Y	2.284	0.443	Be	Mg	Cd	Cd	Ge	Sn	Hf	Hf	2.741	0.521	Be	Mg	Mg	Cd	Sn	Zr	Hf	Hf	3.185	0.709	
Ca	Zn	Ge	Sn	In	In	Y	Y	1.070	0.480	Sr	Ba	Ba	Cd	Ge	Sn	Zr	Hf	2.284	0.358	Cd	Cd	Ti	Hf	Al	Ga	Ga	Sc	2.741	0.617	Zn	Cd	Si	Hf	Sc	Y	Y	Y	3.185	0.646	
Ca	Ba	Ge	Sn	Ga	Ga	Ga	Sc	1.071	0.719	Mg	Ca	Si	Si	Al	In	In	Y	2.285	0.633	Sr	Zn	Ge	Ti	Al	Al	Al	Sc	2.741	0.343	Be	Mg	Ba	Ba	Si	Sn	Sn	Ti	3.185	0.659	
Mg	Ba	Ge	Ge	Ga	Ga	In	Sc	1.071	0.704	Mg	Cd	Si	Si	Al	In	In	Sc	2.285	0.587	Zn	Cd	Zr	Zr	Al	Al	Al	Sc	2.741	0.771	Be	Zn	Hf	Hf	Al	Al	Sc	Y	3.185	0.654	
Be	Sr	Sn	Sn	Ga	Ga	Sc	Y	1.072	0.630	Ba	Cd	Sn	Ti	In	Y	Y	Y	2.285	0.503	Be	Ba	Ti	Hf	Ga	Ga	Sc	Sc	2.741	0.754	Mg	Mg	Sr	Cd	Cd	Ti	Zr	Zr	Hf	3.185	0.689
Sr	Cd	Si	Sn	In	In	Sc	Y	1.073	0.531	Ba	Zn	Hf	Hf	Ga	In	Sc	Sc	2.285	0.571	Be	Cd	Si	Hf	In	Y	Y	Y	2.741	0.589	Mg	Mg	Ge	Ti	Al	In	Sc	Sc	3.185	0.669	
Sr	Zn	Sn	Sn	Al	Ga	Y	Y	1.074	0.604	Ca	Ca	Si	Sn	Ga	Sc	Y	Y	2.285	0.599	Mg	Sr	Cd	Cd	Cd	Sn	Ti	Zr	2.741	0.392	Be	Mg	Zr	Zr	Al	Sc	Y	Y	3.185	0.664	
Sr	Zn	Si	Sn	In	In	In	Sc	1.074	0.959	Ca	Ca	Si	Hf	Ga	In	In	Sc	2.285	0.519	Mg	Mg	Si	Hf	Al	In	Y	Y	2.741	0.449	Mg	Mg	Sr	Cd	Si	Ti	Ti	Hf	3.186	0.723	
Ca	Ca	Sn	Sn	Al	Ga	In	Sc	1.075	0.953	Ca	Cd	Ti	Ti	Al	In	In	Y	2.285	0.555	Sr	Ba	Hf	Hf	Ga	Sc	Y	Y	2.741	0.416	Be	Cd	Ti	Zr	In	Sc	Sc	Sc	3.186	0.783	
Be	Cd	Ge	Ge	Ga	In	In	Y	1.078	0.947	Be	Zn	Ge	Hf	Ga	Ga	In	In	2.285	0.600	Ca	Ba	Si	Ge	Al	Sc	Sc	Sc	2.741	0.556	Be	Mg	Ca	Cd	Ti	Ti	Hf	Hf	3.186	0.683	
Zn	Cd	Ge	Sn	In	In	Y	Y	1.079	0.941	Ca	Sr	Si	Hf	Ga	Ga	In	In	2.285	0.520	Sr	Sr	Si	Ge	Al	Sc	Sc	Y	2.741	0.603	Sr	Ba	Si	Al	Sc	Y	Y	Y	3.186	0.738	
Ba	Ba	Ge	Sn	Al	Al	Ga	Sc	1.079	0.927	Ba	Ba	Zn	Zn	Si	Sn	Ti	Zr	2.285	0.841	Mg	Ba	Zn	Cd	Ge	Ge	Ge	Ti	2.741	0.441	Ca	Zn	Ge	Ti	Sc	Sc	Y	Y	3.186	0.890	
Mg	Sr	Ge	Sn	In	In	Sc	Sc	1.081	0.886	Mg	Ba	Ba	Cd	Si	Si	Ge	Sn	2.285	0.848	Ba	Zn	Hf	Hf	Al	Al	Ga	Sc	2.741	0.418	Be	Mg	Ba	Zn	Sn	Hf	Hf	Hf	3.186	0.690	
Sr	Cd	Ge	Sn	Ga	Ga	Y	Y	1.081	1.025	Zn	Cd	Si	Si	Al	Ga	Ga	In	2.285	0.547	Ca	Ca	Ba	Cd	Si	Ti	Hf	Hf	2.742	0.564	Mg	Cd	Ge	Hf	Sc	Sc	Sc	Y	3.186	0.682	
Ca	Sr	Ge	Sn	In	In	Y	Y	1.082	1.012	Be	Ba	Si	Hf	Al	Al	In	In	2.286	0.779	Ca	Ca	Ba	Cd	Si	Si	Sn	Ti	2.742	0.687	Ca	Cd	Si	Ti	In	Sc	Sc	Sc	3.186	0.706	
Sr	Cd	Si	Ge	Al	In	In	In	1.082	0.959	Cd	Hf	Ti	Hf	Al	Ga	In	Y	2.286	0.852	Be	Sr	Ba	Cd	Ti	Ti	Zr	Zr	2.742	0.554	Mg	Ba	Si	Zr	Sc	Y	Y	Y	3.186	0.647	
Ca	Ba	Ge	Ge	Al	In	In	Y	1.083	0.848	Ca	Sr	Ti	Hf	Al	In	In	In	2.286	0.547	Be	Cd	Zr	Zr	Ga	In	In	Sc	2.742	0.712	Zn	Cd	Si	Zr	Al	Al	Al	Ga	3.186	0.677	
Ba	Zn	Sn	Sn	Al	Ga	Ga	Sc	1.083	1.142	Ca	Ca	Ge	Ti	Ga	In	In	Sc	2.286	0.763	Zn	Cd	Si	Sn	Sc	Sc	Sc	Y	2.742	0.724	Mg	Zn	Cd	Cd	Sn	Ti	Zr	Zr	3.187	0.715	
Cd	Cd	Ge	Sn	Ga	Ga	Y	Y	1.084	1.129	Be	Cd	Si	Ge	In	In	Sc	Sc	2.286	0.850	Cd	Cd	Si	Hf	Al	Al	Ga	Sc	2.742	0.444	Be	Cd	Cd	Zr	Sc	Sc	Sc	Y	3.187	0.601	
Ba	Ba	Ge	Sn	Ga	Ga	In	Sc	1.084	1.064	Mg	Sr	Ba	Cd	Sn	Sn	Hf	Hf	2.286	0.545	Sr	Ba	Ba	Cd																	

Be	Ba	Sn	Sn	Al	Ga	Y	Y	1.136	0.317	Mg	Cd	Ge	Zr	Ga	Ga	Y	Y	2.294	0.690	Sr	Sr	Ge	Hf	Al	Sc	Y	Y	2.747	0.734	Mg	Mg	Zr	Hf	Al	In	In	Sc	3.192	0.813
Ba	Cd	Si	Ge	In	In	In	Sc	1.136	0.296	Ba	Cd	Si	Hf	Al	Al	Y	Y	2.294	0.726	Mg	Zn	Sn	Hf	Ga	Y	Y	Y	2.747	0.454	Mg	Mg	Zr	Hf	Al	In	In	Sc	3.193	0.619
Cd	Cd	Si	Ge	In	In	In	Sc	1.137	0.559	Sr	Ba	Sn	Zr	Ga	Ga	Ga	In	2.294	0.491	Mg	Ba	Zr	Zr	Al	Al	In	Sc	2.747	0.756	Be	Be	Cd	Ge	Ge	Ti	Zr	3.193	0.442	
Be	Ca	Si	Sn	In	In	In	Y	1.137	0.548	Ca	Ba	Ba	Cd	Si	Sn	Zr	Zr	2.294	0.844	Sr	Cd	Zr	Cd	Si	Ga	Sc	Sc	2.747	1.116	Be	Mg	Zn	Zn	Sn	Sn	Ti	Hf	3.193	0.551
Ba	Cd	Sn	Sn	Al	Al	Al	Ga	Sc	1.138	0.521	Ba	Zn	Ge	Hf	Al	Al	Sc	2.294	0.851	Cd	Cd	Cd	Cd	Si	Ge	Sn	Hf	2.748	0.588	Be	Mg	Ge	Sn	Al	Ga	Ga	Sc	3.193	0.497
Ba	Ba	Sn	Sn	Al	Al	Ga	Sc	1.139	0.501	Sr	Cd	Ti	Zr	Ga	Ga	Y	Y	2.294	0.480	Be	Zn	Cd	Cd	Ge	Ge	Sn	Hf	2.748	0.868	Mg	Ca	Cd	Sn	Ti	Hf	Hf	3.193	0.567	
Be	Cd	Ge	Sn	In	In	In	Y	1.139	0.602	Sr	Ba	Zr	Zr	In	In	Y	Y	2.294	0.783	Ca	Ba	Si	Hf	In	Y	Y	Y	2.748	1.141	Mg	Ca	Ti	Ti	Al	Al	In	Sc	3.193	0.675
Ca	Zn	Sn	Sn	Al	Ga	Ga	Sc	1.139	0.590	Be	Sr	Si	Ge	In	Sc	Sc	Sc	2.294	0.812	Be	Ba	Zr	Zr	Al	Al	In	Sc	2.748	0.301	Zn	Zn	Zr	Hf	Al	Ga	Ga	Sc	3.193	0.532
Mg	Sr	Ge	Ge	Al	In	In	Y	1.140	0.554	Mg	Sr	Si	Hf	In	In	Sc	Sc	2.295	0.839	Zn	Zn	Ge	Hf	Al	Al	In	Sc	2.748	0.345	Be	Ba	Ba	Zn	Si	Si	Ti	Hf	3.193	0.542
Ca	Cd	Si	Ge	Ga	In	In	In	1.140	0.517	Ca	Sr	Ti	Hf	Ga	In	In	In	2.295	0.767	Sr	Zr	Zr	Zr	Al	In	Sc	Sc	2.748	0.310	Mg	Cd	Zr	Zr	Al	Al	Sc	Y	3.193	0.740
Mg	Ca	Si	Sn	Ga	In	In	In	1.140	0.617	Ba	Ba	Zn	Cd	Si	Ti	Hf	Hf	2.295	0.806	Be	Ca	Ba	Zn	Sn	Sn	Al	Ti	2.748	1.086	Be	Zn	Si	Sn	Al	Al	Al	Ga	3.193	0.577
Ca	Sr	Sn	Sn	Al	Al	Ga	Sc	1.140	0.814	Be	Mg	Sn	Sn	Al	In	Sc	Sc	2.295	0.829	Ca	Ba	Zr	Hf	Al	Al	Al	Y	2.748	0.962	Zn	Zn	Ti	Hf	Al	Ga	Ga	Sc	3.193	0.433
Sr	Zn	Si	Sn	In	In	Y	Y	1.140	0.780	Sr	Ba	Zr	Hf	Ga	In	In	In	2.295	0.907	Mg	Mg	Ge	Ti	Al	Ga	In	In	2.748	0.704	Be	Be	Si	Hf	Ga	In	In	Sc	3.193	0.535
Mg	Sr	Ge	Sn	Al	Al	In	In	1.140	0.773	Sr	Cd	Zr	Zr	Al	In	Y	Y	2.295	0.914	Sr	Ba	Zr	Zr	Ga	Sc	Sc	Y	2.748	1.338	Ca	Cd	Si	Zr	Ga	Sc	Sc	3.194	0.477	
Ba	Zn	Ge	Ge	Ga	In	In	Sc	1.140	0.797	Ca	Ba	Zn	Cd	Ge	Ge	Ge	Zr	2.295	0.809	Mg	Ca	Zr	Hf	In	In	Sc	Sc	2.748	1.152	Be	Ca	Ba	Zn	Ge	Ge	Ge	Zr	3.194	0.437
Mg	Cd	Sn	Sn	Al	Ga	Ga	In	1.141	0.783	Be	Ca	Si	Zr	Ga	In	In	In	2.295	1.004	Be	Ba	Ba	Zn	Ge	Al	Ga	Y	2.748	0.755	Be	Be	Ba	Zn	Ge	Sn	Ti	Ti	3.194	0.551
Ca	Ba	Si	Ge	In	In	In	Y	1.141	0.690	Sr	Zn	Si	Ge	Al	Al	Y	Y	2.295	1.007	Mg	Zn	Sn	Zr	Al	Al	Ga	Ga	2.748	0.463	Ca	Zn	Zr	Hf	Al	Al	Al	In	3.194	0.679
Be	Ca	Ge	Sn	In	In	Y	Y	1.141	0.946	Be	Ba	Zr	Hf	Ga	Y	Y	Y	2.295	0.881	Be	Sr	Si	Ge	Sc	Y	Y	Y	2.748	0.509	Ca	Sr	Ba	Ba	Sn	Sn	Zr	Hf	3.194	0.767
Ca	Sr	Ge	Sn	In	In	Sc	Sc	1.142	0.932	Be	Ba	Sn	Al	Al	Al	Y	Y	2.295	0.866	Be	Zn	Ti	Cd	Ga	Ga	In	In	2.748	0.478	Be	Be	Sn	Ti	Ga	Ga	In	Sc	3.194	0.801
Sr	Sr	Sn	Sn	Al	Ga	Ga	Sc	1.142	0.830	Ca	Ba	Zn	Zn	Si	Sn	Sn	Hf	2.295	0.946	Be	Ba	Ba	Cd	Ti	Zr	Zr	Hf	2.748	0.594	Be	Zn	Sn	Hf	Al	Al	Al	Ga	3.194	0.778
Ba	Cd	Sn	Sn	Al	Ga	Ga	Sc	1.144	0.647	Sr	Cd	Si	Hf	Ga	Ga	Sc	Sc	2.295	0.881	Ca	Sr	Zr	Hf	Ga	Y	Y	Y	2.749	0.631	Sr	Ba	Ba	Zn	Sn	Ti	Ti	Zr	3.194	0.652
Be	Sr	Sn	Sn	Al	Ga	Ga	Sc	1.144	0.964	Mg	Ca	Ca	Cd	Si	Ge	Sn	Sc	2.295	1.053	Ca	Sr	Ge	Zr	Ga	Y	Y	Y	2.749	0.518	Mg	Ca	Si	Zr	In	In	Sc	Sc	3.194	0.752
Ca	Zn	Sn	Sn	Al	Ga	Ga	In	1.145	0.950	Ca	Sr	Ge	Ge	Ga	Sc	Y	Y	2.295	1.081	Be	Be	Be	Ba	Si	Ge	Sn	Zr	2.749	1.467	Ca	Ba	Ti	Zr	Sc	Sc	Y	Y	3.194	0.725
Sr	Sr	Si	Sn	Ga	In	In	Sc	1.146	0.836	Sr	Sr	Si	Si	Al	Ga	In	Sc	2.295	1.017	Mg	Zn	Si	Sn	Al	Al	Al	In	2.749	1.392	Be	Be	Sn	Hf	Al	Al	Ga	Sc	3.194	0.620
Ba	Zn	Si	Ge	Ga	In	In	In	1.147	0.634	Mg	Ba	Sn	Zr	Al	Al	Al	Sc	2.295	0.857	Be	Sr	Zr	Zr	Ga	Ga	In	Sc	2.749	1.240	Be	Ca	Zn	Cd	Si	Si	Hf	Hf	3.194	0.809
Mg	Cd	Sn	Sn	Al	In	In	Sc	1.147	0.671	Mg	Sr	Ge	Ti	Ga	Ga	Ga	Sc	2.296	1.058	Zn	Cd	Si	Hf	Al	Al	Y	Y	2.749	0.603	Be	Cd	Ge	Ti	Sc	Y	Y	Y	3.194	0.777
Mg	Ba	Si	Sn	In	In	Y	Y	1.148	0.604	Ca	Zn	Zr	Hf	In	In	In	Y	2.296	0.996	Ca	Ca	Ca	Cd	Si	Sn	Ti	Hf	2.749	0.723	Mg	Ca	Ba	Cd	Si	Si	Si	Hf	3.195	0.743
Ca	Cd	Ge	Ge	Al	Ga	In	Y	1.148	0.546	Mg	Sr	Sn	Ti	Ga	Ga	Sc	Sc	2.296	0.819	Ba	Zn	Ge	Hf	Sc	Y	Y	Y	2.749	0.911	Be	Be	Sr	Zn	Ge	Ti	Zr	Zr	3.195	0.809
Be	Ca	Si	Sn	Ga	In	In	In	1.148	0.535	Ca	Cd	Sn	Hf	Al	Al	Sc	Sc	2.296	1.052	Ca	Cd	Si	Ge	Al	Y	Y	Y	2.749	0.747	Be	Mg	Ge	Ti	Ga	Ga	Ga	Y	3.195	0.668
Ca	Zn	Sn	Sn	Al	In	Y	Y	1.148	0.498	Ba	Ba	Zn	Cd	Si	Si	Ge	Ti	2.296	0.991	Be	Cd	Ti	Ti	Ga	In	In	Sc	2.749	0.831	Ca	Ca	Ba	Zn	Si	Ge	Ge	Zr	3.195	0.722
Ba	Cd	Ge	Zr	In	In	In	Y	1.149	0.480	Be	Cd	Sn	Zr	In	In	Sc	Sc	2.297	1.136	Mg	Ca	Sn	Hf	Ga	Sc	Sc	Sc	2.749	0.919	Be	Sr	Ba	Ba	Si	Si	Ge	Sn	3.195	0.885
Sr	Cd	Sn	Zr	Al	In	In	In	1.149	0.418	Sr	Ba	Si	Ti	In	In	Y	Y	2.297	1.079	Mg	Mg	Sn	Zr	Al	Al	In	Sc	2.749	0.701	Sr	Sr	Ba	Zn	Si	Ti	Ti	Hf	3.195	0.719
Ba	Cd	Si	Ge	Ga	In	In	In	1.150	0.711	Sr	Cd	Ti	Ti	Al	In	Y	Y	2.297	0.902	Be	Be	Sr	Cd	Cd	Ge	Sn	Zr	2.749	0.971	Be	Mg	Ti	Hf	Al	Y	Y	Y	3.195	0.612
Be	Ca	Ge	Ga	Ga	In	In	In	1.150	0.695	Sr	Cd	Zr	Zr	Ga	In	Sc	Sc	2.297	0.936	Mg	Cd	Sn	Hf	Al	Al	Al	Ga	2.749	1.294	Be	Cd	Zr	Zr	Al	Ga	Sc	Sc	3.195	0.715
Be	Sr	Si	Ge	In	In	In	Y	1.150	0.626	Mg	Sr	Si	Ge	Ga	Y	Y	Y	2.297	1.049	Be	Ba	Zn	Zn	Si	Sn	Sn	Zr	2.749	0.815	Be	Be	Be	Zn	Ge	Ti	Zr	Hf	3.195	0.668
Ca	Ba	Ge	Sn	Al	Ga	Ga	Ga	1.152	0.517	Ba	Cd	Sn	Zr	Ga	Y	Y	Y	2.297	0.867	Be	Cd	Si	Ti	Ga	Ga	Y	Y	2.749	1.073	Be	Zn	Sn	Ti	Al	Al	Al	In	3.195	0.665
Ba	Cd	Sn	Ti	Al	Ga	In	In	1.152	0.771	Ba	Ba	Ti	Zr	In	In	Sc	Sc	2.297	0.898	Be	Ca	Si	Zr	Ga	Ga	Ga	In	2.749	1.317	Mg	Ba	Si	Zr	Sc	Sc	Y	Y	3.195	0.707
Ca	Cd	Sn	Sn	Ga	Ga	Sc	Y	1.153	0.754	Ca	Zn	Sn	Zr	Al	Al	Ga	Ga	2.297	1.042	Sr	Zn	Ge	Zr	Sc	Sc	Y	Y	2.749	0.535	Ca	Ba	Ba	Zn	Si	Ge	Ge	Ti	3.195	0.576
Sr	Zn	Ge	Sn	Al	Al	In	In	1.153	0.678	Be	Ca	Ti	Hf	In	In	Y	Y	2.297	0.860	Mg	Cd	Ge	Ti	Ga	Ga	Ga	Sc	2.749	0.590	Ca	Sr	Ti	Ti	Al	Sc	Y	Y	3.195	0.649
Mg	Zn	Sn	Sn	Ga	In	In	Y	1.154	0.556	Zn	Cd	Ti	Zr	Al	Al	In	In	2.297	0.754	Be	Sr	Zn	Zn	Ge	Sn	Sn	Zr	2.749	0.561	Be	Ca	Si	Hf	Sc	Y	Y	Y	3.195	0.779
Be	Ba	Ge	Ge	In	In	Sc	Y	1.155	0.585	Ca	Cd	Ti	Ti	Al	Ga	In	In	2.297	0.907	Be	Be	Sr	Zn	Si	Si	Sn	Zr	2.749	0.639	Zn	Zn	Si	Hf	Ga	Sc	Sc	Y	3.196	0.627
Ba	Zn	Ge	Hf	In	In	In	Y	1.155	0.869	Sr	Sr	Si	Hf	Al	Al	Ga	Y	2.297	0.900	Sr	Ba	Zn	Cd	Ti	Hf	Hf	Hf	2.749	0.550	Be	Be	Mg	Ba	Ge	Ge	Sn	Ti	3.196	0.566
Sr	Zn	Sn	Sn	Ga	In	Sc	Sc	1.157	0.870	Be	Ba	Zr	Zr	Ga	In	Y	Y	2.297	0.715	Mg	Zn	Si	Sn	Al	Y	Y	Y	2.749	0.359	Mg	Ba	Zn	Zn	Si	Si	Zr	Hf	3.196	0.662
Mg	Sr	Sn	Sn	Al	In	Sc	Sc	1.157	0.866	Ca	Sr	Ti	Ti	Al	In	In	Y	2.297	0.897	Sr	Sr	Ba	Cd	Ti	Zr	Zr	Hf	2.750	0.856	Be	Mg	Ba	Ba	Ge	Sn	Sn	Ti	3.196	0.591
Ba	Cd	Sn	Ti	Ga	In	In	In	1.157	0.845	Be	Ba	Ba	Cd	Ge	Sn	Ti	Ti	2.298	0.886	Sr	Ba	Si	Ti	Zr	Ga	Ga	Sc	2.750	0.728	Be	Cd	Si	Hf	In	Sc	Sc	Sc	3.196	0.560
Sr	Ba	Si	Ge	In	In	In	Y	1.158	0.832	Cd	Cd	Si	Hf	Al	Al																								

Mg	Cd	Ge	Sn	In	In	Y	Y	1.205	1.112	Mg	Ca	Ge	Hf	Ga	Ga	Ga	In	2.304	0.968	Zn	Zn	Ge	Ti	Ga	In	Sc	Sc	2.755	0.560	Mg	Ca	Ti	Zr	In	Sc	Sc	Sc	3.205	0.690	
Sr	Zn	Si	Ge	Ge	In	In	Sc	1.206	1.016	Ca	Sr	Si	Ge	In	Y	Y	Y	2.304	1.009	Sr	Sr	Ba	Cd	Sn	Ti	Ti	Hf	2.755	0.644	Mg	Mg	Ba	Cd	Si	Si	Ge	Ti	3.205	0.674	
Be	Ba	Si	Sn	In	In	In	Sc	1.206	0.850	Ca	Sr	Zr	Hf	In	In	Y	Y	2.304	0.907	Mg	Sr	Zn	Si	Sn	Sn	Ti	2.755	0.618	Be	Mg	Ca	Zn	Sn	Zr	Zr	Zr	3.205	0.894		
Ca	Ba	Si	Sn	Ga	Ga	In	In	1.207	0.872	Ca	Ba	Zn	Ti	Ti	Ga	Ga	In	Y	2.304	0.962	Be	Ca	Si	Si	Al	Ga	Ga	In	2.755	1.211	Mg	Mg	Zn	Cd	Si	Si	Ge	Zr	3.205	0.741
Be	Sr	Ge	Ge	Ga	In	In	Sc	1.207	0.522	Be	Ba	Zr	Hf	Ga	Ga	In	In	2.304	0.999	Be	Sr	Ge	Ti	Al	Al	Al	Y	2.755	1.070	Mg	Mg	Ba	Cd	Si	Si	Ge	Ti	3.205	0.507	
Mg	Ba	Si	Sn	Ga	Ga	Ga	Y	1.208	0.510	Ca	Ba	Si	Sn	Al	Al	Al	In	2.304	1.032	Sr	Sr	Ba	Cd	Si	Si	Ge	Zr	2.755	0.820	Mg	Zn	Ge	Hf	Sc	Sc	Y	Y	3.206	0.624	
Ca	Ca	Ge	Sn	Al	Ga	Ga	Y	1.208	0.507	Ca	Ba	Zr	Hf	Al	In	In	In	2.304	1.042	Zn	Cd	Cd	Cd	Ge	Sn	Ti	Hf	2.755	1.456	Be	Mg	Ge	Ge	Al	Ga	Sc	Sc	3.206	0.635	
Ca	Sr	Ge	Ge	Ga	In	In	Sc	1.210	0.443	Mg	Ba	Si	Sn	Al	Sc	Sc	Sc	2.304	0.966	Be	Ba	Si	Zr	Al	Al	Y	Y	2.755	1.262	Zn	Cd	Si	Ti	Al	Y	Y	Y	3.206	0.513	
Mg	Cd	Si	Sn	In	In	In	Y	1.211	0.432	Sr	Zn	Ge	Sn	Al	Sc	Sc	Sc	2.304	1.131	Sr	Zn	Si	Hf	Ga	Y	Y	Y	2.755	0.879	Be	Sr	Zn	Si	Ge	Ge	Zr	Zr	3.206	0.642	
Ba	Zn	Hf	Ga	In	In	In	Y	1.211	0.406	Sr	Zn	Si	Si	Ga	Ga	Sc	Y	2.304	1.136	Be	Cd	Ge	Zr	Al	Al	Ga	Ga	2.755	0.541	Mg	Mg	Ca	Cd	Ge	Ge	Zr	Hf	3.206	0.828	
Ca	Sr	Ge	Sn	Al	Ga	Ga	Ga	1.212	0.651	Zn	Zn	Sn	Zr	Al	Ga	Ga	Y	2.304	1.023	Sr	Sr	Zr	Hf	Al	Al	Ga	Sc	2.755	0.629	Mg	Ca	Ge	Ti	Al	Al	Al	Sc	3.206	0.916	
Be	Ba	Si	Ge	Al	In	In	Sc	1.213	0.641	Zn	Cd	Si	Si	In	In	Sc	Y	2.304	0.473	Be	Ba	Ti	Hf	Al	Al	Al	In	2.755	0.605	Be	Mg	Cd	Sn	Ti	Ti	Zr	Zr	3.206	0.960	
Zn	Cd	Si	Sn	In	In	In	Sc	1.213	0.608	Ca	Ba	Zn	Cd	Ge	Ge	Ti	Ti	2.304	0.403	Ba	Ba	Zr	Hf	Ga	Ga	Sc	Y	2.756	0.642	Ca	Zn	Si	Zr	Al	Y	Y	Y	3.206	0.916	
Sr	Cd	Sn	Ti	Al	In	In	In	1.213	0.596	Ca	Sr	Si	Zr	Ga	Ga	Ga	Y	2.304	0.333	Ca	Zn	Sn	Hf	Ga	Sc	Sc	Y	2.756	0.748	Ca	Ca	Zn	Sn	Si	Sn	Ti	Zr	3.206	0.797	
Ca	Sr	Ge	Sn	Al	Al	In	In	1.213	0.682	Mg	Cd	Ti	Zr	Ga	In	In	In	2.304	0.618	Sr	Cd	Zr	Zr	Al	Al	Sc	Y	2.756	0.650	Be	Be	Si	Sn	Al	Al	In	Sc	3.206	0.912	
Ba	Ba	Si	Sn	Al	In	In	Sc	1.213	0.671	Be	Be	Sn	Hf	Ga	In	Y	Y	2.304	0.555	Be	Sr	Ti	Hf	Al	Al	Y	Y	2.756	1.581	Sr	Sr	Ba	Zn	Si	Ti	Ti	Zr	3.206	0.863	
Ca	Cd	Si	Ge	In	In	In	Y	1.214	0.629	Ca	Zn	Ge	Hf	Al	Al	Y	Y	2.305	0.486	Mg	Ca	Cd	Cd	Si	Si	Sn	Ti	2.756	1.515	Be	Ca	Ge	Ti	Sc	Y	Y	Y	3.207	0.755	
Sr	Cd	Sn	Ti	Ga	In	In	In	1.215	0.601	Ca	Sr	Si	Ge	Al	Al	Y	Y	2.305	0.571	Sr	Cd	Ti	Zr	Al	Al	Al	In	2.756	1.369	Mg	Zn	Ge	Hf	In	Sc	Sc	Sc	3.207	0.975	
Mg	Ba	Ge	Ge	Al	In	In	Sc	1.215	0.699	Ba	Ba	Si	Zr	Al	Al	Ga	Y	2.305	0.574	Ca	Zn	Si	Sn	Sc	Sc	Sc	Y	2.756	0.676	Sr	Cd	Ti	Zr	Sc	Y	Y	Y	3.207	0.921	
Ba	Cd	Sn	Zr	Ga	Ga	Ga	In	1.216	1.033	Sr	Sr	Sn	Ti	In	Sc	Sc	Y	2.305	0.509	Zn	Zn	Si	Sn	Al	Sc	Sc	Y	2.756	0.858	Mg	Mg	Ca	Cd	Si	Ge	Zr	Zr	3.207	0.877	
Sr	Sr	Si	Sn	Al	In	In	Sc	1.216	0.996	Ba	Ba	Zn	Ge	Al	Al	Sc	Sc	2.305	0.558	Be	Mg	Ge	Ge	Ga	Sc	Y	Y	2.756	1.044	Ca	Ca	Ba	Zn	Ge	Ti	Hf	Hf	3.207	0.949	
Sr	Zn	Sn	Sn	Al	Al	Al	Sc	1.217	0.988	Ba	Zn	Zn	Cd	Si	Si	Zr	Hf	2.305	0.575	Sr	Ba	Zn	Zn	Ge	Ti	Hf	Hf	2.756	0.789	Be	Ca	Ba	Cd	Si	Si	Si	Ti	3.207	0.796	
Ca	Cd	Si	Sn	In	In	Y	Y	1.217	1.020	Ca	Ba	Sn	Ti	Al	Al	Al	Sc	2.305	0.511	Mg	Cd	Si	Sn	Al	Al	Sc	Sc	2.756	0.963	Ca	Sr	Si	Ti	Ga	Sc	Sc	Sc	3.207	0.847	
Mg	Zn	Ge	Sn	In	In	In	Y	1.217	1.005	Ca	Ba	Ge	Hf	Ga	Ga	Sc	Sc	2.305	0.810	Mg	Ba	Zr	Zr	Al	Al	Ga	Y	2.757	1.059	Be	Ca	Ti	Hf	Al	Al	Ga	Ga	3.207	1.032	
Be	Sr	Sn	Sn	In	Sc	Sc	Y	1.218	0.886	Ba	Ba	Zn	Hf	Al	Ga	Sn	Ti	2.305	0.799	Zn	Cd	Ge	Ti	Al	Al	Al	In	2.757	0.775	Mg	Mg	Ti	Zr	Al	In	In	Sc	3.207	0.854	
Sr	Cd	Sn	Sn	Al	Al	Ga	Sc	1.218	1.119	Ca	Cd	Hf	Zn	Al	Ga	In	Y	2.305	0.528	Be	Ca	Cd	Cd	Ge	Ge	Zr	Hf	2.757	1.096	Be	Sr	Zn	Cd	Ti	Ti	Hf	Hf	3.207	0.680	
Mg	Sr	Si	Sn	In	In	Y	Y	1.218	1.105	Sr	Zn	Cd	Cd	Si	Si	Ge	Zr	2.305	0.762	Ca	Ba	Ge	Zr	Sc	Sc	Sc	Y	2.757	1.412	Be	Mg	Si	Zr	Al	Al	In	In	3.207	0.798	
Ba	Ba	Zn	Ge	Zr	In	In	Y	1.218	0.975	Sr	Ba	Si	Ge	Al	Al	Al	Ga	2.305	0.808	Mg	Cd	Si	Hf	Al	Al	Ga	Ga	2.757	0.859	Ca	Sr	Ba	Zn	Ge	Ge	Ge	Zr	3.208	0.796	
Ba	Ba	Zn	Ge	Sn	Ga	Ga	Sc	1.219	0.774	Ca	Sr	Si	Sn	Al	Al	Sc	Sc	2.306	0.534	Be	Be	Ba	Cd	Si	Ge	Ge	Ti	2.757	1.195	Ca	Zn	Ti	Zr	Al	Al	Al	In	3.208	0.794	
Mg	Zn	Sn	Sn	Al	Ga	In	In	1.219	1.111	Ba	Cd	Zr	Hf	Ga	Ga	In	Y	2.306	0.748	Ba	Cd	Si	Ge	Ge	Y	Y	Y	2.757	1.442	Ca	Zn	Si	Ti	Al	Al	Al	Y	3.208	0.842	
Be	Ba	Ge	Sn	Ga	Ga	Y	Y	1.220	0.907	Sr	Ba	Zn	Zn	Si	Si	Ti	Hf	2.306	0.808	Mg	Ca	Ti	Zr	Ga	Ga	In	In	2.757	0.590	Sr	Zn	Ti	Hf	Sc	Y	Y	Y	3.208	0.721	
Ca	Cd	Sn	Sn	Al	Al	Sc	Sc	1.221	0.955	Ca	Sr	Ba	Cd	Sn	Ge	Hf	Hf	2.306	0.533	Ca	Sr	Zr	Hf	Al	Ga	Ga	Ga	2.757	0.670	Ca	Cd	Ti	Ti	Al	Sc	Y	Y	3.208	0.768	
Sr	Ba	Si	Sn	Ga	Ga	Ga	Y	1.221	0.735	Be	Sr	Cd	Si	Si	Ge	Sn	Y	2.306	0.783	Ca	Cd	Si	Ti	Ga	Ga	Sc	Sc	2.757	0.650	Be	Ca	Zn	Zn	Ge	Ge	Sn	Hf	3.208	0.921	
Ba	Zn	Sn	Hf	In	In	In	Sc	1.222	0.761	Mg	Ca	Si	Sn	In	Sc	Sc	Sc	2.306	0.804	Sr	Sr	Ba	Cd	Si	Ti	Ti	Zr	2.757	0.740	Ba	Cd	Si	Ti	Sc	Y	Y	Y	3.208	0.779	
Sr	Cd	Sn	Hf	Ga	Ga	Ga	In	1.223	0.843	Zn	Cd	Si	Ge	Al	Al	Ga	Ga	2.306	0.503	Zn	Zn	Si	Hf	Al	Al	Ga	In	2.757	0.634	Mg	Sr	Si	Zr	Sc	Sc	Sc	Y	3.208	0.628	
Mg	Sr	Sn	Sn	Al	Al	Ga	Sc	1.223	0.790	Sr	Sr	Ba	Cd	Ge	Sn	Hf	Hf	2.306	0.770	Zn	Zn	Ge	Hf	Al	Al	Sc	Y	2.757	0.450	Mg	Mg	Ge	Ti	Al	Al	In	Sc	3.208	0.739	
Be	Sr	Ge	Ge	Al	In	In	Y	1.223	0.780	Be	Ba	Ge	Zr	Ga	Y	Y	Y	2.306	0.800	Be	Ba	Zn	Si	Si	Al	In	In	Y	2.757	0.948	Be	Mg	Zr	Zr	Ga	Ga	In	Y	3.208	0.737
Sr	Zn	Ge	Ge	Ga	In	In	Sc	1.225	0.735	Ca	Cd	Si	Zr	Ga	Ga	Ga	Y	2.307	0.496	Be	Cd	Zr	Zr	Zr	Ga	Ga	In	Y	2.757	0.812	Mg	Ca	Zr	Hf	Ga	Sc	Sc	Sc	3.209	0.624
Be	Ba	Sn	Sn	Ga	Sc	Sc	Y	1.226	0.719	Ba	Ba	Si	Zr	Ga	Ga	Sc	Sc	2.307	0.918	Zn	Cd	Hf	Hf	Al	Sc	Y	Y	2.757	0.503	Be	Be	Ca	Zn	Ti	Zr	Hf	Hf	3.209	0.748	
Zn	Cd	Si	Ge	Al	In	In	In	1.226	0.645	Sr	Zn	Ti	Ti	Al	Ga	In	In	2.307	0.924	Be	Ba	Cd	Cd	Si	Si	Sn	Ti	2.757	0.272	Mg	Ca	Zr	Zr	Al	Sc	Sc	Y	3.209	0.907	
Ba	Cd	Sn	Zr	In	In	Y	Y	1.226	0.930	Be	Ba	Ti	Ti	Al	Ga	In	In	2.307	0.491	Mg	Mg	Ba	Cd	Si	Sn	Hf	Hf	2.757	0.372	Be	Mg	Ti	Hf	In	In	Sc	Sc	3.209	0.926	
Mg	Sr	Si	Sn	Ga	Ga	Ga	In	1.227	0.915	Sr	Cd	Ti	Zr	Ga	Ga	Ga	In	2.307	0.835	Ca	Ba	Zr	Hf	Al	Al	Ga	Ga	2.758	0.314	Mg	Ca	Ti	Hf	Al	Al	Ga	Ga	3.209	0.970	
Be	Sr	Sn	Sn	In	Sc	Y	Y	1.227	0.832	Mg	Zn	Ge	Ti	Ga	Ga	In	In	2.307	0.826	Ca	Ba	Ti	Hf	Al	Ga	Ga	Sc	2.758	0.387	Be	Cd	Ti	Ti	Al	Ga	Ga	Y	3.209	0.930	
Sr	Ba	Ge	Ge	Al	In	Ga	Sc	1.227	0.718	Be	Sr	Cd	Cd	Ge	Sn	Ti	Y	2.307	0.624	Be	Be	Ti	Hf	Ga	In	Y	Y	2.758	0.519	Mg	Zn	Si	Zr	Ga	Ga	Ga	Sc	3.209	0.824	
Be	Sr	Sn	Sn	Al	Al	Ga	Y	1.228	0.995	Sr	Zn	Si	Si	Al	Ga	Y	Y	2.307	0.770	Mg	Sr	Zn	Zn	Si	Sn	Zr	Zr	2.758	0.383	Be	Ba	Ti	Hf	Al	Sc	Y	Y	3.209	0.930	
Sr	Sr	Si	Sn	Ga	Ga	In	Y																																	

Sr	Zn	Sn	Hf	Al	In	In	In	1.269	0.868	Ca	Ba	Zr	Hf	In	In	In	Sc	2.315	1.077	Ca	Cd	Zr	Zr	Al	Al	In	Sc	2.763	0.951	Ca	Ca	Ba	Zn	Ge	Ge	Ti	Hf	3.215	0.727	
Ba	Ba	Si	Sn	Al	Ga	Ga	Y	1.269	0.853	Zn	Zn	Si	Sn	Al	In	Sc	Sc	2.315	0.914	Ca	Ca	Zn	Cd	Si	Ti	Ti	Zr	2.763	0.643	Zn	Cd	Ti	Zr	Al	Al	Sc	Sc	3.216	0.851	
Cd	Ca	Si	Ge	Al	Ga	In	In	1.270	0.778	Mg	Cd	Ge	Ti	Ga	Ga	Ga	In	2.315	0.939	Ca	Ba	Ge	Hf	Al	Al	Sc	Sc	2.763	0.379	Mg	Ca	Si	Zr	Al	Al	Al	In	3.216	1.043	
Ca	Cd	Ge	Sn	Ga	Ga	Ga	In	1.271	1.054	Cd	Ca	Cd	Cd	Si	Si	Zr	Hf	2.315	0.996	Mg	Mg	Sr	Cd	Si	Si	Sn	Hf	2.763	0.519	Be	Be	Ca	Sr	Ge	Ge	Sn	Ti	3.216	1.106	
Be	Cd	Sn	Sn	Ga	Ga	In	Y	1.273	1.040	Ba	Ba	Ti	Hf	Ga	In	In	Sc	2.315	0.339	Be	Ca	Zr	Hf	Al	Y	Y	Y	2.763	0.453	Be	Zn	Cd	Cd	Ge	Sn	Ti	Ti	3.216	1.144	
Mg	Ca	Ge	Sn	Ga	Ga	Ga	In	1.274	0.955	Mg	Sr	Cd	Cd	Ge	Ge	Sn	Hf	2.316	0.249	Sr	Cd	Zr	Hf	Al	Al	Al	In	2.763	0.459	Be	Be	Si	Zr	Al	Ga	In	In	3.216	1.092	
Ba	Ba	Ge	Sn	Ga	In	Y	Y	1.274	0.846	Sr	Cd	Ge	Zr	Al	Al	Al	Y	2.316	0.232	Be	Sr	Si	Si	Al	Ga	Sc	Y	2.763	0.656	Mg	Mg	Zn	Zn	Si	Ge	Sn	Ti	3.216	0.996	
Sr	Cd	Si	Sn	Ga	Ga	Ga	Y	1.274	1.119	Mg	Cd	Sn	Hf	Al	Al	Y	Y	2.316	0.430	Be	Ca	Hf	Hf	Ga	In	In	Sc	2.763	0.512	Ca	Sr	Si	Ti	Al	Al	Sc	Sc	3.216	1.095	
Be	Ba	Si	Sn	Ga	Ga	Ga	Y	1.275	1.104	Be	Cd	Ge	Ti	Al	Al	In	In	2.316	0.199	Sr	Cd	Si	Zr	Al	Al	Al	Sc	2.763	1.128	Be	Ca	Ti	Zr	Ga	Ga	Ga	Sc	3.216	1.038	
Cd	Cd	Si	Ge	Al	Ga	In	In	1.275	1.013	Ca	Cd	Zr	Zr	Ga	In	Y	Y	2.316	0.113	Be	Sr	Sr	Zn	Si	Sn	Hf	Hf	2.763	1.098	Be	Be	Ca	Cd	Si	Si	Zr	Hf	3.216	0.941	
Be	Zn	Ge	Sn	Ga	In	In	In	1.276	0.892	Ba	Ba	Zn	Sn	Ti	Al	Al	Sc	Sc	2.316	0.410	Sr	Sr	Si	Zr	Al	Al	Sc	Y	2.763	0.959	Zn	Cd	Si	Si	Al	Al	Sc	Y	3.216	1.146
Ba	Cd	Si	Ge	In	In	Y	Y	1.276	0.935	Be	Ba	Hf	Hf	In	Sc	Y	Y	2.316	0.203	Ba	Ba	Zn	Si	Si	Ga	Sc	Sc	Y	2.763	0.423	Mg	Cd	Ti	Zr	Al	Y	Y	Y	3.217	1.084
Ca	Ba	Si	Ge	Ga	In	In	In	1.276	0.285	Zn	Zn	Ge	Al	Al	Al	Sc	Y	2.317	0.192	Sr	Sr	Ti	Hf	In	Ga	Sc	Y	Y	2.763	0.628	Be	Ca	Ba	Ba	Si	Si	Ge	Sn	3.217	1.064
Be	Sr	Ge	Ge	In	In	Sc	Y	1.277	0.241	Be	Mg	Sr	Zn	Si	Sn	Sn	Sn	2.317	0.474	Mg	Ca	Ti	Hf	In	Ga	Ga	Y	Y	2.764	0.715	Mg	Zn	Ba	Zn	Ge	Ge	Sn	Ti	3.217	1.128
Mg	Cd	Sn	Sn	Al	In	Y	Y	1.277	0.233	Ca	Sr	Ti	Zr	In	In	In	Sc	2.317	0.064	Mg	Mg	Si	Ge	Al	Ga	Ga	In	2.764	0.519	Mg	Ca	Si	Si	Al	Al	Ga	Sc	3.217	0.978	
Sr	Sr	Ge	Sn	Al	In	Sc	Sc	1.278	0.143	Ca	Sr	Zn	Zn	Si	Sn	Sn	Hf	2.317	0.123	Be	Cd	Si	Si	Ga	Ga	In	Sc	2.764	0.750	Be	Mg	Ca	Cd	Ti	Zr	Zr	Zr	3.217	1.019	
Zn	Cd	Sn	Sn	Al	Ga	Ga	Y	1.278	0.129	Be	Be	Ba	Ba	Zn	Si	Sn	Sn	Hf	2.317	0.487	Ca	Sr	Zn	Zn	Si	Si	Sn	Ti	2.764	0.746	Mg	Sr	Ti	Zr	Sc	Sc	Y	Y	3.217	1.197
Ba	Ba	Ge	Sn	Ga	In	Sc	Sc	1.278	0.143	Ba	Ba	Ge	Sn	Sc	Y	Y	Y	2.317	0.040	Mg	Mg	Sn	Zn	Al	In	In	Sc	Sc	2.764	0.496	Mg	Ca	Sr	Si	Ge	Sn	Sn	Sn	3.217	1.023
Sr	Sr	Si	Sn	Ga	Ga	In	In	1.278	0.445	Be	Ba	Sn	Zr	Al	Al	Al	Ga	2.318	0.111	Sr	Cd	Si	Ge	Al	Sc	Sc	Sc	2.764	0.802	Mg	Zn	Ti	Zr	Ga	Ga	Ga	Y	3.217	0.825	
Sr	Ba	Ge	Ge	Al	Ga	Ga	Y	1.278	0.433	Sr	Cd	Zr	Hf	Ga	Ga	Y	Y	2.318	0.491	Be	Ba	Si	Hf	Ga	Sc	Sc	Sc	2.764	1.017	Be	Mg	Cd	Cd	Ge	Ge	Ti	Zr	3.217	0.943	
Ca	Sr	Ge	Ge	Ga	Ga	In	Y	1.278	0.448	Ba	Zn	Ge	Hf	In	Y	Y	Y	2.318	0.346	Ca	Ca	Zr	Hf	Al	Ga	Y	Y	2.764	0.562	Be	Zn	Zn	Cd	Si	Si	Sn	Ti	3.217	0.974	
Be	Cd	Ge	Sn	In	In	Y	Y	1.279	0.398	Sr	Cd	Sn	Ti	Al	Al	Sc	Sc	2.318	0.289	Be	Be	Sn	Cd	Cn	Zr	Zr	Hf	2.764	0.916	Be	Mg	Sn	Hf	Ga	Sc	Sc	Sc	3.217	0.970	
Sr	Cd	Sn	Zr	Ga	Ga	In	In	1.281	0.524	Sr	Zn	Ti	Ti	In	In	Sc	Y	2.318	0.464	Be	Ca	Zr	Zr	Al	Ga	In	In	2.764	1.063	Mg	Zn	Sn	Ti	Al	Al	Sc	Sc	3.217	1.011	
Sr	Zn	Ge	Ge	Ga	In	Y	Y	1.281	0.510	Ca	Sr	Sn	Zr	Al	Al	Y	Y	2.318	0.361	Be	Sr	Ti	Zr	In	Sc	Sc	Sc	2.764	0.441	Be	Zn	Ti	Ti	Al	Ga	Ga	In	3.217	0.901	
Be	Ba	Sn	Hf	In	In	In	Y	1.282	0.517	Be	Ca	Ba	Cd	Sn	Sn	Zr	2.318	0.405	Mg	Ba	Ba	Cd	Ge	Ti	Ti	Zr	2.764	0.561	Be	Mg	Si	Sn	Al	Al	Al	In	3.217	0.930		
Ca	Cd	Si	Sn	Ga	Ga	Ga	In	1.283	0.452	Sr	Zn	Sn	Zr	Zr	Al	Al	Sc	2.318	0.514	Mg	Sr	Sr	Cd	Ge	Ti	Zr	Zr	2.764	0.534	Be	Mg	Zn	Cd	Ti	Ti	Zr	Zr	3.218	1.076	
Mg	Sr	Ge	Ge	In	In	Sc	Y	1.283	0.561	Ca	Ba	Zr	Hf	Ga	In	In	In	2.318	0.205	Sr	Ba	Hf	Hf	Al	Sc	Sc	Y	2.764	0.870	Mg	Zn	Zn	Zn	Si	Ge	Sn	Ti	3.218	0.946	
Ba	Cd	Sn	Ti	Ga	Ga	Ga	In	1.284	0.377	Be	Ba	Cd	Cd	Si	Sn	Zr	Zr	2.318	0.348	Be	Ca	Zr	Zr	Ga	Sc	Y	Y	2.764	0.787	Be	Mg	Ca	Ba	Sn	Sn	Sn	Hf	3.218	0.763	
Cd	Cd	Sn	Al	Al	In	In	Y	1.285	0.342	Be	Mg	Sn	Sn	Al	Al	In	Sc	2.318	0.523	Sr	Zn	Ti	Ti	In	In	Sc	Sc	2.764	0.656	Mg	Mg	Ti	Ti	Al	Ga	In	Y	3.218	0.874	
Ba	Ba	Sn	Zr	In	In	In	Sc	1.285	0.336	Be	Cd	Si	Zr	In	In	In	Y	2.318	0.177	Mg	Sr	Ge	Ti	In	Sc	Sc	Sc	2.764	1.025	Ca	Ca	Ti	Zr	Al	Sc	Y	Y	3.218	0.912	
Mg	Cd	Ge	Sn	Ga	Ga	Ga	In	1.286	0.257	Ba	Ba	Zn	Zn	Si	Sn	Zr	Hf	2.318	0.337	Be	Cd	Cd	Cd	Si	Ge	Sn	Zr	2.764	0.945	Be	Be	Zn	Zn	Si	Sn	Ti	Hf	3.218	0.746	
Ca	Cd	Sn	Hf	Al	In	In	In	1.287	0.244	Be	Ba	Si	Ge	Ga	Sc	Sc	Sc	2.320	0.496	Sr	Cd	Zr	Zr	Al	Al	Ga	Sc	2.764	0.698	Mg	Mg	Ca	Cd	Ge	Ti	Hf	Hf	3.218	0.870	
Sr	Zn	Ti	Ti	In	In	In	Y	1.287	0.273	Mg	Cd	Si	Si	Al	In	In	Y	2.318	0.624	Sr	Cd	Zn	Zn	Sn	Ti	Zr	Hf	2.764	0.505	Be	Ba	Si	Zr	Sc	Y	Y	Y	3.218	1.058	
Ca	Sr	Si	Sn	Ga	Ga	Ga	In	1.287	0.561	Ba	Cd	Sn	Sc	Sc	Sc	Sc	Y	2.318	0.689	Be	Ba	Zn	Zn	Sn	Sn	Ti	Hf	2.764	0.648	Ca	Zn	Si	Hf	Ga	Sc	Sc	Sc	3.218	0.871	
Mg	Sr	Ge	Ge	Al	Ga	Ga	In	1.287	0.549	Ca	Sr	Si	Ti	In	In	Y	Y	2.318	0.532	Mg	Sr	Zr	Zr	Al	Al	Ga	In	2.764	0.569	Mg	Mg	Zn	Cd	Cn	Ti	Ti	Zr	3.218	0.868	
Ca	Zn	Si	Sn	In	In	In	Sc	1.288	0.580	Ca	Zn	Si	Zr	Ga	Ga	Y	Y	2.319	0.488	Ca	Zn	Si	Ti	Ga	Ga	Ga	Sc	2.764	0.567	Be	Zn	Zn	Si	Ge	Sc	Y	Y	3.218	0.862	
Sr	Zn	Ge	Ge	In	In	Sc	Y	1.289	0.537	Be	Be	Ba	Cd	Ge	Sn	Sn	Ti	2.319	0.636	Be	Zn	Ti	Hf	Ga	Ga	Y	Y	2.764	0.779	Ba	Ba	Si	Ti	Al	Sc	Y	Y	3.218	0.747	
Ca	Ba	Ge	Ge	In	In	Sc	Y	1.289	0.630	Be	Zn	Ge	Ti	Al	In	In	In	2.319	0.540	Ba	Ba	Ti	Zr	Al	Al	Sc	Y	2.764	0.632	Be	Zn	Zn	Cd	Si	Ge	Ge	Hf	3.218	0.797	
Ba	Cd	Ge	Ge	Al	In	Y	Y	1.289	0.618	Ba	Cd	Hf	Hf	Al	Ga	Ga	Y	2.319	0.462	Be	Sr	Ge	Zr	Al	Al	Al	Sc	2.765	1.041	Mg	Mg	Sn	Ti	Al	Sc	Y	Y	3.219	0.791	
Sr	Zn	Sn	Hf	Ga	In	In	In	1.289	0.640	Zn	Zn	Sn	Zr	Al	Al	In	Sc	2.319	0.625	Mg	Mg	Sn	Ti	Al	Ga	Ga	Y	2.765	1.029	Be	Ba	Zn	Zn	Sn	Ti	Zr	Zr	3.219	0.702	
Ca	Cd	Sn	Sn	Al	Al	Ga	Y	1.289	0.583	Mg	Mg	Sn	Zr	Al	In	In	Y	2.319	0.402	Ca	Cd	Hf	Hf	Al	Ga	Ga	In	2.765	0.903	Mg	Ba	Zn	Cd	Ti	Zr	Zr	Zr	3.219	0.870	
Ba	Ba	Si	Sn	Al	Ga	Ga	In	1.289	0.672	Ca	Ba	Si	Zr	Ga	Ga	In	In	2.319	0.286	Ca	Cd	Ti	Ti	Ga	In	Sc	Sc	2.765	0.514	Sr	Ba	Si	Ti	Al	Sc	Sc	Sc	3.219	0.798	
Mg	Ba	Sn	Sn	Al	Ga	Sc	Sc	1.290	0.199	Be	Ba	Sn	Zr	Al	Al	Sc	Sc	2.319	0.262	Be	Be	Sn	Hf	Al	Al	In	Y	2.765	0.687	Ca	Ca	Zn	Ge	Sn	Ti	Hf	3.219	0.836		
Ca	Sr	Si	Sn	Ga	Ga	Ga	Y	1.291	0.166	Be	Mg	Ge	Ge	Ga	Ga	In	Y	2.319	0.415	Mg	Mg	Si	Sn	Ga	Sc	Sc	Y	2.765	0.722	Be	Mg	Ba	Zn	Si	Zr	Zr	Zr	3.219	0.890	
Sr	Ba	Sn	Sn	Al	Ga	Ga	Y	1.291	0.161	Mg	Cd	Sn	Ti	In	In	Sc	Sc	2.319	0.274	Mg	Sr	Ti	Ti	Al	Al	Ga	In	2.765	0.592	Be	Ca	Zr	Hf	Ga	Ga	Ga	Sc	3.219	0.772	
Mg	Ba	Sn	Sn	In	Sc	Y																																		

Be	Ba	Si	Ge	Ga	In	In	1.321	-0.525	Cd	Cd	Zr	Hf	Ga	In	In	Sc	2.327	0.306	Mg	Ba	Ti	Ti	Al	Ga	Ga	Sc	2.770	0.470	Ca	Ba	Ba	Zn	Si	Ti	Ti	Hf	3.228	0.867	
Sr	Zn	Ge	Sn	Al	Ga	Ga	1.322	-0.624	Be	Mg	Ge	Ge	Ga	In	In	Sc	2.327	0.254	Sr	Ba	Zn	Zn	Sn	Ti	Zr	Zr	2.770	0.889	Be	Be	Sr	Zn	Sn	Ti	Ti	Zr	3.228	0.803	
Mg	Sr	Si	Sn	Al	Ga	Ga	1.322	-0.214	Cd	Zn	Cd	Cd	Ge	Sn	Hf	Hf	2.327	0.334	Mg	Sr	Hf	Hf	Ga	Sc	Sc	Y	2.770	0.869	Mg	Sr	Sr	Zn	Ge	Ge	Ti	Zr	3.228	0.460	
Mg	Ca	Sn	Sn	Al	Ga	Sc	1.322	-0.238	Ca	Zn	Si	Hf	Al	Al	In	In	2.327	0.082	Ca	Ba	Ba	Cd	Sn	Ti	Ti	Zr	2.770	0.717	Be	Be	Mg	Ca	Si	Sn	Sn	Zr	3.228	0.882	
Be	Sr	Si	Ge	Al	In	In	1.323	-0.549	Cd	Cd	Zr	Hf	Al	Ga	Ga	In	2.327	-0.069	Be	Sr	Si	Hf	Al	Al	Y	Y	2.770	0.500	Mg	Mg	Ca	Cd	Si	Ti	Ti	Hf	3.228	0.814	
Sr	Zn	Sn	Hf	In	In	In	1.323	-0.227	Ca	Zn	Cd	Ge	Ge	Sn	Ti	2.328	-0.107	Cd	Cd	Zr	Hf	Al	Ga	Ga	Sc	2.770	0.536	Be	Cd	Hf	Hf	Al	Ga	Ga	Sc	3.229	0.678		
Mg	Zn	Sn	Sn	Ga	In	Y	1.323	-0.253	Mg	Ba	Si	Ge	Al	Al	Y	2.328	-0.114	Cd	Ba	Ba	Cd	Si	Si	Ti	Zr	2.770	0.540	Mg	Zn	Ge	Zr	Al	Al	Sc	Sc	3.229	0.931		
Ca	Ba	Ge	Ge	Ga	Ga	In	1.323	-0.576	Cd	Cd	Si	Zr	Ga	Ga	In	Sc	-0.069	Ca	Ca	Ba	Cd	Sn	Zr	Hf	Hf	2.770	0.623	Ca	Ba	Ba	Zn	Si	Si	Ge	Zr	3.229	0.731		
Be	Ba	Sn	Zr	In	In	In	1.323	-0.232	Mg	Ca	Si	Zr	Ga	In	In	2.328	-0.113	Be	Sr	Ti	Hf	Al	Ga	Ga	Ga	2.770	0.645	Ca	Ba	Hf	Hf	Al	Al	Ga	Sc	3.229	0.591		
Cd	Cd	Ge	Sn	Al	Ga	Ga	Y	-0.256	Ca	Zn	Cd	Si	Ge	Ge	Sn	2.328	0.055	Ca	Sr	Ti	Ti	Al	In	Sc	Sc	2.770	0.543	Mg	Sr	Sr	Zn	Ge	Zr	Hf	Hf	3.229	0.964		
Be	Cd	Sn	Al	Ga	Ga	In	1.324	-0.580	Mg	Cd	Ge	Hf	In	In	Sc	2.328	0.030	Ca	Ca	Ba	Cd	Ge	Zr	Hf	Hf	2.771	0.534	Mg	Cd	Ge	Ti	In	Sc	Sc	Sc	3.229	0.743		
Ba	Zn	Ge	Ti	In	In	In	Y	1.324	-0.219	Mg	Ba	Zr	Zr	Ga	In	Y	2.328	0.019	Sr	Ba	Ti	Hf	In	Sc	Sc	Sc	2.771	0.663	Mg	Mg	Zn	Cd	Si	Zr	Hf	Hf	3.229	0.431	
Ba	Cd	Sn	Hf	Al	Al	In	1.324	-0.283	Ca	Cd	Cd	Cd	Si	Sn	Zr	Hf	2.328	0.399	Ca	Ca	Zn	Cd	Si	Zr	Hf	Hf	2.771	0.809	Be	Be	Sr	Zn	Si	Ge	Zr	Zr	3.229	0.567	
Ba	Cd	Sn	Ti	In	In	Y	1.325	-0.614	Ba	Ba	Si	Si	Al	In	Sc	Y	2.328	0.280	Zn	Cd	Cd	Cd	Ge	Sn	Ti	Zr	2.771	0.630	Mg	Mg	Zn	Cd	Si	Si	Zr	Hf	3.229	0.499	
Sr	Cd	Si	Sn	In	In	Sc	1.325	-0.218	Mg	Sr	Zn	Zn	Si	Ge	Sn	Sn	2.328	0.263	Mg	Zn	Zn	Cd	Si	Ge	Ge	Sn	2.771	0.766	Mg	Ba	Ba	Zn	Sn	Ti	Ti	Zr	3.229	0.708	
Cd	Cd	Si	Ge	Ga	In	In	Y	-0.289	Zn	Zn	Si	Hf	Al	In	In	Y	2.329	0.567	Ca	Ca	Ba	Cd	Sn	Ti	Zr	Zr	2.771	0.826	Be	Be	Si	Ti	Al	In	In	Y	3.230	0.931	
Ca	Ba	Ge	Sn	Al	Ga	Ga	Y	-0.626	Mg	Ba	Si	Zr	Ga	Ga	Ga	In	2.329	0.254	Mg	Sr	Sr	Cd	Si	Al	Sn	Ti	2.771	0.553	Mg	Ba	Sr	Zn	Si	Si	Ge	Sn	3.230	0.779	
Zn	Cd	Si	Sn	In	In	Y	1.326	-0.017	Mg	Mg	Sn	Ti	Ga	In	Y	Y	2.329	0.206	Mg	Cd	Sn	Zr	Al	Al	Sc	Sc	2.771	0.636	Be	Ca	Cd	Cd	Si	Ti	Ti	Hf	3.230	0.628	
Ba	Cd	Ge	Hf	In	In	Y	1.327	-0.027	Ca	Ca	Ge	Ge	Al	Al	In	Sc	2.329	0.387	Ca	Ba	Zr	Hf	Al	Al	Al	In	2.771	0.588	Ca	Sr	Sr	Zn	Ge	Zr	Zr	Hf	3.230	0.962	
Ca	Sr	Ge	Ge	In	In	Sc	1.327	-0.569	Zn	Zn	Ge	Si	Ga	Ga	In	Sc	2.329	0.102	Mg	Cd	Sn	Hf	Al	Al	Y	Y	2.771	0.771	Be	Ca	Ti	Zr	Sc	Sc	Sc	Y	3.230	0.793	
Zn	Cd	Sn	Hf	Ga	In	In	1.327	-0.151	Ca	Ca	Ge	Ti	Al	Al	In	Y	2.329	0.148	Ca	Sr	Zn	Cd	Si	Zr	Zr	Zr	2.771	0.745	Be	Mg	Sn	Hf	Al	Al	Al	In	3.230	0.497	
Sr	Ba	Sn	Sn	In	Sc	Sc	Y	-0.172	Ba	Zn	Sn	Ti	In	Y	Y	Y	2.329	0.515	Ca	Ba	Ti	Ti	Al	Al	In	Sc	2.771	0.604	Ca	Sr	Sr	Zn	Sn	Zr	Zr	Hf	3.230	0.626	
Sr	Ba	Ge	Sn	Al	Al	In	Sc	-0.385	Sr	Zn	Zr	Hf	Ga	Ga	In	In	2.329	-0.025	Mg	Ca	Ti	Ti	Ga	Ga	In	Y	2.771	0.912	Mg	Mg	Si	Hf	Al	In	Sc	Sc	3.230	0.579	
Sr	Ba	Ge	Sn	Al	Al	Ga	Ga	-0.178	Ca	Zn	Cd	Cd	Si	Ge	Ge	Hf	2.329	0.080	Be	Cd	Hf	Hf	Al	Al	Ga	In	2.771	0.888	Mg	Mg	Si	Zr	Al	Ga	Ga	In	3.230	0.518	
Mg	Cd	Ge	Sn	Al	Al	In	1.329	-0.189	Sr	Sr	Zn	Cd	Sn	Ti	Hf	Hf	2.329	0.542	Zn	Zn	Si	Ti	Al	Ga	Ga	In	2.771	0.595	Mg	Cd	Ti	Ti	In	Sc	Sc	Y	3.230	0.658	
Ca	Ca	Si	Sn	In	In	In	Sc	-0.416	Be	Sr	Cd	Ge	In	In	Sc	Sc	2.329	-0.044	Be	Sr	Si	Ge	Al	Sc	Sc	Sc	2.771	0.560	Mg	Ca	Zn	Zn	Ge	Ge	Ti	Zr	3.230	0.805	
Ba	Zn	Ge	Hf	Al	Al	In	1.330	-0.186	Be	Ba	Si	Hf	Ga	Ga	Ga	Y	2.329	0.070	Mg	Sr	Sr	Cd	Si	Ti	Hf	Hf	2.772	0.608	Ca	Cd	Ti	Hf	Ga	Sc	Sc	Sc	3.231	1.124	
Sr	Zn	Sn	Zr	Al	In	In	1.330	-0.192	Sr	Ba	Zn	Zn	Si	Si	Ge	Sn	2.329	0.602	Sr	Ba	Zr	Zr	Al	Al	Sc	Sc	2.772	0.473	Mg	Ca	Cd	Cd	Si	Ge	Ge	Ti	3.231	1.176	
Ca	Zn	Si	Sn	In	In	Y	1.330	-0.421	Ca	Zn	Cd	Cd	Si	Sn	Hf	Hf	2.329	0.406	Mg	Mg	Si	Hf	Ga	Ga	In	Y	2.772	0.663	Mg	Ca	Cd	Cd	Si	Si	Zr	Zr	3.231	1.129	
Ba	Zn	Ge	Hf	Ga	In	In	1.330	-0.189	Ca	Ba	Cd	Cd	Si	Si	Ge	Hf	2.329	0.381	Be	Ba	Ba	Zn	Sn	Sn	Ti	Zr	2.772	0.721	Be	Sr	Zn	Cd	Ti	Ti	Zr	Zr	3.231	1.727	
Be	Ba	Sn	Hf	Ga	In	In	1.332	-0.240	Sr	Sr	Si	Ti	Zr	Ga	Ga	In	2.330	0.435	Be	Ba	Ti	Ti	Al	Al	Ga	Y	2.772	0.481	Ca	Ca	Si	Ti	Ga	Sc	Y	Y	3.231	1.004	
Be	Ba	Si	Sn	Al	Al	In	1.332	-0.462	Zn	Ca	Ge	Zr	Al	Ga	Ga	In	2.330	0.296	Zn	Zn	Cd	Cd	Ge	Sn	Ti	Hf	2.772	0.904	Mg	Zn	Cd	Cd	Ti	Zr	Zr	Hf	3.231	0.955	
Ba	Zn	Si	Sn	Ga	Ga	Ga	Y	-0.191	Zn	Ca	Si	Zr	Al	Ga	In	In	2.330	0.363	Be	Be	Ba	Cd	Cd	Ge	Ti	Hf	2.772	0.887	Ca	Ti	Zr	Zr	Al	Y	Y	Y	3.231	0.624	
Sr	Cd	Ge	Hf	In	In	In	Sc	-0.247	Mg	Sr	Cd	Cd	Ge	Ge	Sn	Zr	2.330	0.560	Mg	Sr	Sr	Cd	Ge	Ge	Ti	Zr	2.772	0.727	Ca	Ca	Ba	Zn	Ge	Ge	Ti	Zr	3.231	1.019	
Sr	Sr	Ge	Sn	Ga	Ga	Sc	Y	-0.475	Ca	Cd	Ge	Sn	Al	Y	Y	Y	2.330	0.168	Mg	Ba	Ti	Hf	Al	Al	Ga	Ga	2.772	0.554	Be	Zn	Si	Zr	Ga	Ga	Ga	Y	3.231	0.966	
Sr	Cd	Sn	Ti	In	In	In	Sc	-0.006	Mg	Ca	Si	Zr	In	In	Y	Y	2.330	0.307	Mg	Zn	Cd	Cd	Si	Si	Sn	Ge	2.772	0.560	Be	Be	Mg	Zn	Si	Si	Sn	Zr	3.231	0.842	
Ca	Sr	Ge	Ge	Al	Ga	In	1.335	-0.002	Be	Ca	Ge	Hf	Ga	Ga	Sc	Sc	2.331	0.586	Mg	Ba	Cd	Cd	Si	Si	Sn	Hf	2.772	0.552	Be	Zn	Zn	Cd	Sn	Ti	Hf	Hf	3.231	1.062	
Mg	Sr	Si	Ge	Al	Ga	In	1.336	-0.433	Ba	Zn	Cd	Cd	Ge	Ti	Hf	Hf	2.331	0.148	Sr	Cd	Ge	Zr	Al	Sc	Sc	Sc	2.772	0.676	Be	Mg	Cd	Cd	Ge	Ti	Zr	Zr	3.231	0.882	
Be	Ba	Ge	Ge	Al	Ga	In	1.336	-0.147	Ca	Sr	Ti	Zr	Al	In	In	In	2.331	0.298	Be	Ca	Zr	Hf	Al	Al	In	In	2.772	0.657	Ca	Ca	Ba	Zn	Sn	Zr	Hf	Hf	3.231	0.751	
Be	Ca	Si	Sn	Al	In	In	1.336	-0.197	Be	Ba	Ge	Hf	Al	Al	Al	In	2.331	0.430	Ca	Ba	Ba	Cd	Ti	Zr	Hf	Hf	2.772	0.534	Be	Sr	Sr	Zn	Si	Ge	Ge	Ti	3.231	1.096	
Ba	Zn	Sn	Ti	Ga	In	In	1.336	-0.126	Ba	Cd	Zr	Zr	Al	Ga	Ga	Y	2.331	0.599	Mg	Cd	Hf	Hf	Al	Al	In	Y	2.772	0.565	Be	Mg	Zn	Cd	Cd	Ge	Zr	Zr	3.232	0.893	
Mg	Ca	Sn	Sn	Al	Al	Ga	Sc	-0.150	Sr	Sr	Si	Hf	Zr	Al	Ga	Ga	Sc	2.331	0.632	Be	Mg	Si	Si	Ga	In	In	Y	2.773	0.658	Mg	Sr	Sr	Zn	Si	Ge	Ti	Ti	3.232	0.613
Be	Sr	Si	Sn	In	In	Sc	Sc	-0.203	Sr	Ba	Si	Hf	Al	Ga	Ga	Ga	2.331	0.546	Mg	Ca	Sr	Cd	Cd	Ge	Ge	Zr	2.773	0.799	Ca	Cd	Ge	Ti	Sc	Y	Y	Y	3.232	0.753	
Ba	Zn	Si	Ge	In	In	Y	1.338	-0.138	Sr	Ba	Ge	Hf	Al	Al	Al	Ga	2.331	0.505	Be	Ba	Cd	Cd	Ge	Ti	Hf	Hf	2.773	0.661	Ca	Ba	Si	Ti	Al	Sc	Y	Y	3.232	0.682	
Mg	Zn	Ge	Sn	Ga	Ga	In	1.339	0.027	Be	Ba	Hf	Hf	Al	In	In	Y	2.332	0.586	Be	Ca	Sn	Zr	Sc	Y	Y	Y	2.773	0.750	Mg	Zn	Ti	Ti	Ga	Ga	Ga	Y	3.232	0.865	
Ca	Ca	Si	Sn	Ga	In	In	Sc	1.339	0.019	Ca	Cd	Sn	Hf	Al	Al	Al	Ga	2.332	0.571	Be	Ba	Zn	Cd	Ge	Ge	Ti	Ti	2.773	0.794	Mg	Zn	Ge	Zr	Al	Al	Al	Y	3.232	1.055
Ca	Ca	Sn	Sn	Al	Ga	Sc	Y	-0.098	Be	Cd	Si	Zr	Ga	Ga	In	In	2.332	0.488	Be	Ca	Sn																		

Be	Ba	Sn	Hf	Al	In	In	1.372	0.525	Ba	Ba	Si	Hf	Al	Al	Ga	In	2.337	0.160	Ca	Zn	Ge	Zr	Ga	Y	Y	Y	2.777	0.439	Mg	Ca	Si	Ge	Sc	Sc	Y	Y	3.240	0.744		
Ba	Cd	Sn	Hf	Ga	Ga	Y	1.372	0.550	Ba	Ba	Si	Zr	Ga	Ga	In	Sc	2.337	0.359	Mg	Mg	Si	Ge	Ga	In	Sc	Sc	2.778	0.365	Be	Be	Mg	Ca	Ge	Sn	Sn	Zr	3.240	0.805		
Ca	Zn	Ge	Sn	Ga	Ga	Y	1.373	0.786	Sr	Ba	Sn	Zr	Ga	In	Y	Y	2.337	0.358	Ca	Ba	Zr	Hf	Ga	Sc	Sc	Sc	2.778	0.616	Be	Ca	Si	Ti	Al	Al	Y	Y	3.240	0.942		
Ca	Zn	Ge	Sn	Ga	Ga	Y	1.373	0.512	Ca	Ca	Zn	Cd	Ge	Sn	Ti	Ti	2.337	0.572	Sr	Zn	Zr	Hf	Ga	Sc	Sc	Sc	2.778	0.445	Be	Sr	Zn	Cd	Si	Ti	Ti	Ti	3.240	0.789		
Sr	Sr	Ge	Sn	Al	In	Y	1.373	0.541	Ba	Ca	Sn	Ti	Ti	Al	Al	In	Y	2.337	0.637	Mg	Sr	Zr	Zr	Ga	Y	Y	Y	2.778	0.591	Mg	Sr	Sr	Zn	Si	Ti	Hf	Hf	3.240	0.717	
Cd	Cd	Ge	Ge	Al	Ga	In	Y	1.374	0.569	Be	Ba	Hf	Hf	Al	Ga	In	In	2.337	0.460	Zn	Cd	Ge	Hf	Al	Y	Y	Y	2.778	0.742	Be	Ba	Zn	Sn	Si	Si	Ge	Ti	3.240	0.827	
Mg	Zn	Sn	Sn	Al	Ga	In	Sc	1.374	0.347	Ca	Ba	Si	Ti	Ga	Ga	In	In	2.338	0.484	Ba	Cd	Hf	Hf	Ga	Sc	Y	Y	2.778	0.446	Mg	Cd	Hf	Hf	Al	Sc	Sc	Y	3.240	0.769	
Be	Ca	Sn	Sn	Al	Ga	Ga	Y	1.375	0.519	Ca	Ba	Ge	Zr	Ga	Ga	Sc	Sc	2.338	0.606	Be	Zn	Sn	Hf	Ga	Ga	Sc	Sc	2.778	0.562	Mg	Mg	Sn	Ti	Al	Al	Ga	Sc	3.240	0.746	
Ca	Zn	Sn	Hf	In	In	In	1.375	0.553	Be	Be	Ba	Cd	Si	Si	Sn	Zr	2.338	0.484	Be	Cd	Zr	Zr	Al	In	In	Sc	2.778	0.812	Mg	Mg	Ge	Zr	Ga	Ga	Sc	Sc	3.240	0.752		
Be	Ca	Ge	Ge	Ga	In	Y	1.375	0.326	Be	Cd	Ti	Zr	In	In	Y	Y	2.338	0.469	Mg	Ba	Cd	Cd	Sn	Ti	Ti	Hf	2.778	0.311	Mg	Mg	Ti	Zr	Al	Al	In	Y	3.241	0.621		
Zn	Cd	Sn	Zr	Ga	In	In	1.376	0.659	Sr	Ba	Si	Sn	Sc	Sc	Sc	Y	2.338	0.601	Mg	Sr	Ge	Hf	Al	Y	Y	Y	2.778	0.344	Mg	Mg	Sr	Ba	Si	Ge	Ge	Sn	3.241	0.715		
Ca	Cd	Sn	Ti	In	In	In	Y	1.376	0.661	Sr	Zn	Si	Si	Ga	In	Sc	Sc	2.338	0.254	Sr	Sr	Ba	Cd	Ge	Ti	Ti	Zr	2.778	0.480	Be	Sr	Zn	Sn	Ti	Ti	Zr	Zr	3.241	0.818	
Mg	Sr	Sn	Sn	In	Sc	Y	1.377	0.281	Sr	Zn	Cd	Cd	Ge	Ge	Ti	Hf	2.338	0.121	Mg	Zn	Zr	Zr	Al	In	Y	Y	2.778	0.720	Be	Ca	Sr	Zn	Si	Hf	Hf	Hf	3.241	0.667		
Sr	Ba	Si	Sn	In	In	Y	1.378	0.813	Ca	Cd	Si	Ge	In	Y	Y	Y	2.338	0.104	Ba	Zn	Ge	Ti	Al	Y	Y	Y	2.778	0.693	Mg	Sr	Sr	Zn	Ge	Ti	Zr	Zr	3.241	0.655		
Sr	Zn	Si	Ge	In	In	In	Sc	1.378	0.926	Ca	Ga	Sn	Ti	Al	In	Y	Y	2.338	0.279	Sr	Cd	Ti	Ti	In	Sc	Y	Y	2.778	0.694	Ba	Zn	Si	Ti	Sc	Y	Y	Y	3.241	0.756	
Ca	Sr	Sn	Sn	In	Sc	Sc	Y	1.378	0.762	Mg	Zn	Zn	Cd	Si	Ge	Sn	Sn	2.338	0.116	Be	Ca	Sn	Ti	Al	Al	Al	In	2.778	0.800	Mg	Mg	Si	Zr	In	Sc	Y	Y	3.241	0.665	
Ca	Cd	Ge	Ge	Al	Ga	Ga	In	1.378	0.643	Ca	Sr	Zn	Zn	Si	Sn	Sn	Zr	2.338	0.096	Be	Mg	Sn	Hf	Ga	Ga	Ga	In	2.779	0.683	Be	Sr	Ba	Zn	Si	Si	Ti	Ti	3.241	0.640	
Ba	Zn	Si	Sn	In	In	Sc	Sc	1.378	0.867	Mg	Sr	Cd	Cd	Si	Si	Ge	Sn	2.338	0.208	Mg	Sr	Zn	Zn	Sn	Sn	Ti	Zr	2.779	0.719	Zn	Zn	Si	Zr	Al	Ga	Sc	3.241	0.752		
Ca	Sr	Ge	Ge	Al	Ga	Ga	In	1.378	0.689	Sr	Zn	Ge	Zr	Al	Al	In	In	2.338	0.186	Be	Ca	Ti	Hf	Al	Al	In	In	2.779	0.568	Mg	Ca	Zr	Hf	Al	Al	Al	In	3.242	0.831	
Ba	Ba	Ge	Al	Ga	In	Sc	Sc	1.378	0.611	Cd	Cd	Zr	Hf	In	In	Sc	Y	2.338	0.177	Sr	Zn	Ge	Hf	Al	Sc	Sc	Sc	2.779	0.549	Be	Cd	Hf	Hf	Al	Al	Ga	Sc	3.242	1.305	
Ba	Zn	Sn	Ti	In	In	Y	1.379	0.855	Be	Cd	Ge	Zr	Ga	Ga	Y	Y	2.339	0.693	Be	Sr	Ti	Ti	Ga	Sc	Sc	Y	2.779	0.670	Mg	Ca	Ti	Hf	Al	Al	Al	Y	3.242	1.365		
Mg	Sr	Ge	Sn	Ga	Ga	Y	1.379	0.675	Be	Ba	Si	Zr	Al	Al	In	In	2.339	0.575	Ca	Sr	Zr	Zr	In	Sc	Y	Y	2.779	0.550	Ca	Ba	Ba	Zn	Ge	Ti	Ti	Hf	3.242	1.299		
Sr	Ba	Si	Sn	Ga	Ga	Ga	Sc	1.379	0.589	Mg	Ca	Si	Ti	Ga	In	In	Sc	2.339	0.552	Cd	Cd	Zr	Hf	Al	Al	Sc	Y	2.779	0.524	Zn	Ba	Zr	Hf	Al	Al	Ga	Sc	3.242	0.908	
Be	Cd	Si	Sn	In	In	In	Y	1.379	0.625	Ba	Ba	Si	Hf	Ga	In	Sc	Sc	2.339	0.842	Be	Sr	Ge	Zr	Sc	Y	Y	Y	2.779	0.730	Mg	Ba	Ba	Zn	Ge	Ti	Ti	Zr	3.242	1.197	
Sr	Cd	Si	Sn	Ga	Ga	Y	1.379	0.506	Cd	Sr	Si	Si	Al	Ga	In	Sc	2.339	0.543	Mg	Cd	Zr	Zr	Al	In	In	Sc	2.779	0.740	Zn	Cd	Si	Hf	Ga	Sc	Sc	Sc	3.242	1.127		
Ba	Cd	Sn	Sn	In	Sc	Y	1.379	0.565	Sr	Cd	Ba	Cd	Ge	Sn	Zr	Zr	2.339	0.495	Ca	Sr	Si	Si	Al	Ga	Y	Y	2.779	0.637	Be	Ca	Cd	Cd	Si	Ti	Ti	Zr	3.242	0.795		
Mg	Ba	Si	Sn	Ga	Ga	Ga	Sc	1.379	0.609	Ca	Sr	Ge	Hf	Al	Al	In	In	2.339	0.617	Mg	Ba	Si	Ti	Al	Al	Ga	Ga	2.779	0.663	Sr	Zn	Ti	Zr	Sc	Sc	Sc	Y	3.243	1.218	
Cd	Cd	Si	Sn	In	In	Sc	Y	1.379	0.484	Be	Ca	Ge	Hf	Al	Al	In	In	2.339	0.364	Mg	Zn	Ge	Zr	Al	Al	Y	Y	2.779	0.537	Mg	Cd	Ge	Zr	Sc	Y	Y	Y	3.243	1.144	
Sr	Cd	Sn	Sn	Al	Al	Sc	Y	1.380	0.701	Ba	Sr	Zn	Cd	Si	Si	Ti	Ti	2.339	0.441	Mg	Ba	Si	Ti	Al	Al	In	In	2.779	0.495	Be	Be	Ge	Hf	Al	In	Sc	Sc	3.243	1.012	
Ca	Ba	Si	Sn	In	In	Sc	Sc	1.381	0.705	Be	Sr	Si	Sn	Al	Al	Sc	Sc	2.339	0.698	Be	Ca	Sr	Cd	Sn	Zr	Zr	Zr	2.779	0.593	Be	Be	Sr	Zn	Si	Sn	Ti	Ti	3.243	1.238	
Mg	Ba	Si	Sn	Al	Al	In	In	1.381	0.426	Sr	Sr	Sn	Zr	In	Sc	Y	Y	2.339	0.207	Be	Zn	Zr	Zr	In	Sc	Y	Y	2.779	0.556	Be	Sr	Cd	Cd	Ti	Zr	Hf	Hf	3.243	1.045	
Sr	Cd	Ge	Hf	Ga	Ga	In	In	1.381	0.624	Be	Mg	Sn	Zr	Ga	In	In	Sc	2.339	0.366	Mg	Ca	Si	Zr	Al	Al	In	In	2.779	0.480	Ca	Sr	Sr	Zn	Ti	Ti	Zr	Hf	3.243	0.911	
Mg	Cd	Si	Sn	In	In	In	Sc	1.381	0.656	Be	Ca	Ca	Cd	Ge	Sn	Zr	2.339	0.717	Ca	Ba	Ti	Zr	Zr	Al	Ga	Ga	2.779	0.652	Be	Cd	Ti	Hf	Ga	Ga	Ga	Sc	3.243	1.277		
Mg	Ba	Ge	Ge	Al	Ga	Ga	Y	1.381	0.771	Sr	Cd	Ge	Zr	Al	Al	Al	Ga	2.340	0.184	Zn	Zn	Sn	Ti	Al	Al	Sc	Y	2.779	0.555	Be	Mg	Sr	Sr	Si	Sn	Sn	Hf	3.243	1.062	
Ca	Cd	Ge	Ge	Ga	Ga	Y	1.382	0.600	Be	Sr	Hf	Hf	Al	In	Y	Y	2.340	0.354	Be	Ba	Si	Si	Al	Al	Sc	Sc	2.780	0.671	Be	Zn	Cd	Cd	Sn	Zr	Zr	Hf	3.243	0.718		
Be	Ca	Sn	Sn	Al	Al	In	Y	1.382	0.641	Mg	Ba	Ge	Zr	Ga	Ga	Sc	Sc	2.340	0.873	Sr	Cd	Ti	Ti	Al	Ga	Sc	Sc	2.780	0.750	Mg	Zn	Sn	Ti	In	Sc	Sc	Sc	3.243	0.872	
Be	Ba	Ge	Sn	Al	Al	Ga	Ga	1.383	0.751	Mg	Ba	Ba	Zr	Zr	Ga	In	Y	2.340	0.690	Sr	Cd	Si	Ti	In	Y	Y	Y	2.780	0.554	Mg	Cd	Hf	Hf	Al	Al	Ga	Sc	3.243	0.846	
Be	Zn	Sn	Sn	Ga	Ga	In	Y	1.383	0.720	Cd	Cd	Ti	Zr	Ga	In	In	Sc	2.340	0.671	Be	Sr	Si	Ge	Al	Al	Sc	Sc	2.780	0.653	Be	Be	Sr	Ba	Ti	Zr	Zr	Hf	3.243	1.030	
Zn	Cd	Sn	Ti	Ga	In	In	In	1.384	0.724	Ca	Sr	Si	Zr	Ga	Ga	In	In	2.340	0.666	Mg	Ba	Ge	Zr	Sc	Sc	Sc	Y	2.780	0.827	Be	Be	Sn	Zr	Al	Al	Ga	In	3.243	1.226	
Sr	Cd	Ge	Ti	Al	In	In	In	1.385	0.698	Ca	Sr	Cd	Cd	Si	Ge	Ge	Ti	2.340	0.558	Be	Sr	Zr	Hf	Sc	Y	Y	Y	2.780	0.483	Be	Sr	Zn	Zn	Ge	Ge	Ti	Hf	3.243	1.087	
Be	Sr	Sn	Hf	In	In	In	Y	1.385	0.579	Ca	Ba	Zr	Hf	Ga	Ga	Ga	In	2.340	0.659	Ca	Zn	Zr	Hf	Ga	Ga	Ga	In	2.780	0.528	Be	Sr	Sr	Zn	Ge	Ti	Ti	Zr	3.244	0.936	
Sr	Zn	Sn	Zr	In	In	In	Sc	1.386	0.577	Be	Ca	Ba	Cd	Sn	Sn	Sn	Ti	2.340	0.746	Ca	Zn	Ti	Ti	Al	Al	In	Y	2.780	0.656	Be	Cd	Si	Si	Ge	Sc	Sc	Y	3.244	1.263	
Ca	Sr	Ge	Ge	Al	Ga	Ga	Y	1.387	0.472	Mg	Sr	Sn	Hf	In	In	Sc	Sc	2.340	0.402	Sr	Cd	Si	Ti	Al	Al	Al	Y	2.780	0.730	Mg	Zn	Zn	Cd	Si	Si	Ge	Hf	3.244	1.106	
Ca	Ca	Si	Sn	In	In	Sc	Y	1.387	-0.181	Ba	Zn	Ti	Zr	Al	Al	In	In	2.340	0.598	Zn	Cd	Hf	Hf	In	In	Sc	Sc	Y	2.780	0.706	Ca	Ca	Ba	Zn	Ge	Ti	Zr	Zr	3.244	0.771
Mg	Ca	Ge	Sn	In	In	Sc	Sc	1.387	-0.253	Sr	Sr	Zr	Ba	Cd	Si	Sn	Sn	Hf	2.340	0.764	Be	Sr	Si	Zr	In	Sc	Sc	Sc	2.780	0.714	Be	Be	Ca	Ba	Si	Ge	Ge	Zr	3.244	0.918
Ba	Zn	Si	Sn	Al	Al	In	In	1.388	-0.339	Mg	Ca	Zn	Cd	Sn	Sn	Sn	Ti	2.341	0.377	Ca	Zn	Si																		

Sr	Zn	Sn	Ti	Ga	In	In	In	1.412	0.511	Sr	Zn	Si	Sn	Al	Al	Al	Sc	2.346	0.780	Ca	Zn	Cd	Cd	Ge	Ti	Zr	Zr	2.784	0.691	Mg	Ca	Ca	Cd	Ti	Zr	Hf	Hf	3.251	0.873	
Mg	Ba	Ge	Ge	Ga	In	Y	Y	1.412	0.448	Mg	Mg	Ge	Sn	Al	In	Sc	Sc	2.346	0.749	Ca	Cd	Si	Si	In	Sc	Y	Y	2.785	0.959	Be	Ca	Ba	Zn	Ti	Ti	Hf	Hf	3.252	0.888	
Ba	Cd	Ge	Sn	Al	Al	Al	In	1.412	0.064	Ba	Ca	Ge	Zr	Ga	Ga	Ga	In	2.346	0.651	Be	Ca	Si	Ti	Ga	Ga	Y	Y	2.785	0.366	Ca	Sr	Ti	Zr	Sc	Sc	Y	Y	3.252	0.767	
Mg	Ba	Sn	Sn	Al	Al	Al	Sc	Y	1.412	0.729	Be	Ca	Cd	Cd	Ge	Sn	Sn	HF	2.346	0.769	Be	Ca	Sr	Zn	Sn	Sn	HF	2.785	0.427	Be	Sr	Si	Ti	Al	Al	Sc	Sc	3.252	0.833	
Zn	Cd	Ge	Ge	Ga	In	In	Sc	1.413	0.719	Mg	Ba	Cd	Cd	Si	Sn	Ti	Ti	2.347	0.812	Zn	Cd	Ge	Ti	Ga	Y	Y	Y	2.785	0.576	Be	Zn	Ge	Zr	In	Sc	Sc	Sc	3.252	0.960	
Sr	Ba	Sn	HF	In	In	In	Sc	1.413	0.107	Ca	Zn	Ti	Zr	Al	In	In	In	2.347	0.484	Sr	Zn	Zr	Zr	Al	Ga	Ga	Sc	2.785	0.861	Mg	Ca	Zr	HF	Al	Al	Al	Y	3.252	0.819	
Sr	Zn	Ge	HF	In	In	In	In	1.413	0.472	Sr	Sr	Si	HF	Al	In	Y	Y	2.347	0.706	Mg	Ba	Zn	Zn	Ge	Ge	Sn	Zr	2.785	0.814	Be	Be	Ca	Zn	Si	Ti	HF	HF	3.252	0.718	
Sr	Zn	Si	Ge	Ga	In	In	In	1.413	0.534	Mg	Ca	Cd	Cd	Si	Sn	Sn	Ti	2.347	0.829	Be	Ca	Sr	Cd	Ge	Zr	Zr	Zr	2.785	0.818	Be	Mg	Mg	Zn	Sn	Zn	Zr	HF	3.252	0.833	
Be	Zn	Ge	Sn	Al	Al	In	In	1.414	0.335	Mg	Sn	Sn	Ti	In	Y	Y	Y	2.347	0.457	Ca	Zn	Ge	Ti	In	Y	Y	Y	2.785	0.932	Mg	Mg	Ca	Zn	Ge	Ge	Sn	HF	3.253	0.809	
Ba	Zn	Sn	Al	Al	Sc	Y	1.414	0.410	Sr	Cd	Si	Ge	Al	Al	Y	Y	2.347	0.695	Be	Sr	Ge	Zr	Sc	Sc	Y	Y	2.785	0.804	Be	Be	Sn	Ti	Ga	In	Sc	Sc	3.253	0.704		
Mg	Ba	Sn	HF	Ga	In	In	In	1.414	0.501	Be	Sr	Zr	HF	In	In	In	Sc	2.347	0.734	Ca	Ca	Zn	Zn	Si	Ge	Ti	Zr	2.785	0.852	Be	Ca	Sr	Cd	Si	Si	HF	HF	3.253	0.832	
Ba	Zn	Ge	Ge	Al	Ga	Ga	Y	1.414	0.291	Mg	Sr	Sr	HF	Ge	Y	Y	Y	2.347	0.919	Sr	Sr	Si	HF	In	Sc	Y	Y	2.785	0.640	Mg	Sr	Ba	Ca	Si	Ge	Ge	Sn	3.253	0.966	
Sr	Zn	Ge	HF	Al	In	In	In	1.415	0.408	Mg	Ca	Si	Si	Al	In	In	Sc	2.348	0.994	Be	Cd	Ge	Ti	Ga	Ga	Ga	Y	2.785	0.666	Ca	Cd	Si	Ti	Al	Al	Al	Sc	3.253	1.163	
Sr	Ba	Sn	Sn	Al	Al	Sc	Y	1.416	0.495	Ca	Sr	Sr	Cd	Si	Ge	Ge	Sn	2.348	0.794	Mg	Mg	Sn	HF	Al	Al	Sc	Y	2.785	0.804	Mg	Ba	Ba	Zn	Si	Al	Ti	HF	3.253	1.214	
Be	Ba	Sn	Zr	Al	In	In	In	1.416	0.283	Sr	Ba	Si	Zr	Ga	Ga	Ga	Sc	2.348	0.790	Be	Sr	Cd	Cd	Si	Si	Sn	HF	2.785	0.585	Be	Be	Zr	HF	In	Sc	Sc	Y	3.253	1.152	
Be	Sr	Si	Sn	Ga	Ga	Ga	Y	1.416	0.512	Mg	Cd	Ge	Ge	Al	Al	Ga	Sc	2.348	0.943	Sr	Sr	Ba	Ba	Zn	Si	Si	Ge	Sn	2.786	0.633	Mg	Ca	Sr	Zn	Si	Si	Sn	3.253	0.942	
Ca	Cd	Sn	HF	Ga	Ga	Ga	In	1.416	0.465	Be	Be	Ba	Zn	Si	Sn	Zr	Sc	2.348	0.810	Zn	Cd	Zr	Zr	Ga	Ga	Sc	Y	2.786	0.869	Mg	Sr	Zn	Zn	Si	Ge	Ge	Ti	3.253	1.107	
Ca	Ba	Ge	Ge	Ga	Ga	Ga	In	1.417	0.162	Ca	Sr	Zn	Cd	Si	Ge	Ge	Ge	2.348	0.768	Cd	Cd	Ti	Zr	Ga	Sc	Y	Y	2.786	0.867	Be	Cd	Cd	Cd	Sn	Ti	Zr	HF	3.254	1.040	
Ba	Ba	Si	Sn	Al	Al	Ga	Sc	1.417	0.506	Mg	Zn	Ge	HF	Al	Al	In	In	2.348	0.933	Sr	Ba	Zn	Zn	Si	Ti	HF	HF	2.786	0.773	Mg	Ba	Ba	Zn	Si	Si	Ti	Zr	3.254	0.859	
Sr	Cd	Ge	HF	In	In	Y	Y	1.418	0.455	Sr	Zn	Sn	HF	Ge	Y	Y	Y	2.348	0.567	Be	Ca	Ge	Ti	Al	Ga	Ga	Ga	2.786	0.808	Be	Ti	HF	Al	Ga	In	In	3.254	1.141		
Mg	Ba	Sn	Sn	Ga	Sc	Y	Y	1.419	0.147	Ca	Ca	Ge	Zr	Al	In	Sc	Sc	2.348	0.435	Be	Cd	Ge	HF	Ga	Al	Ga	Sc	2.786	0.602	Be	Sr	Zn	Ge	Ge	Ti	Zr	3.254	1.027		
Sr	Zn	Sn	Ti	Al	In	In	In	1.419	0.720	Mg	Ba	Ba	Cd	Si	Sn	Sn	Zr	2.349	0.436	Zn	Cd	Ge	HF	Al	Al	Sc	Sc	2.786	0.629	Ca	Cd	Si	HF	Al	Sc	Sc	Sc	3.254	1.070	
Ba	Cd	Ge	Ge	Al	Ga	Ga	Sc	1.420	0.712	Zn	Zn	Si	Ti	Ga	In	In	Y	2.349	0.585	Ca	Sr	Sr	Cd	Si	Zr	Zr	HF	2.786	0.739	Be	Be	Zn	Zn	Si	Sn	Ti	Zr	3.254	1.142	
Mg	Ba	Sn	HF	Al	In	In	In	1.420	0.174	Mg	Ba	Ti	Ti	Ga	In	Y	Y	2.349	0.424	Zn	Cd	Ti	Ti	In	Sc	Y	Y	2.786	0.585	Be	Be	Zn	Zr	Al	Sc	Sc	Sc	3.254	0.967	
Sr	Cd	Sn	HF	Ga	Ga	Ga	In	1.420	0.519	Mg	Mg	Zn	Cd	Si	Ge	Sn	Sn	2.349	0.425	Mg	Ba	Cd	Cd	Sn	Ti	Ti	Zr	2.786	0.606	Mg	Zn	Zr	Zr	Al	Sc	Y	Y	3.254	0.954	
Cd	Cd	Sn	HF	Ga	Ga	In	In	1.420	0.474	Be	Sr	Si	HF	Ga	Ga	Ga	In	2.349	0.504	Zn	Cd	Ti	Zr	Al	Al	Y	Y	2.786	0.804	Mg	Sr	Si	Si	Al	Sc	Y	Y	3.254	1.195	
Be	Ba	Sn	Ti	Al	In	In	In	1.421	0.445	Be	Be	Zn	Cd	Ge	Sn	Sn	HF	2.349	0.482	Mg	Ba	Zr	Zr	Al	Al	In	Sc	2.787	0.621	Ca	Ca	Sr	Zn	Si	Ti	HF	HF	3.254	0.997	
Ca	Zn	Ge	Ge	Al	Ga	Ga	In	1.421	0.513	Ba	Ba	Zr	HF	Al	In	In	Sc	2.349	0.476	Ca	Ca	Ge	HF	Al	Al	Sc	Sc	2.787	0.795	Be	Ba	Ba	Zn	Sn	Zr	HF	HF	3.254	0.749	
Be	Cd	Si	Ge	Ga	In	In	In	1.421	0.464	Ca	Zn	Zn	Cd	Si	Sn	HF	HF	2.349	0.304	Zn	Zn	Cd	Cd	Si	Sn	Ti	HF	2.787	0.877	Ca	Ca	Sr	Zn	Sn	Ti	HF	HF	3.254	0.882	
Ba	Cd	Si	HF	In	In	In	Y	1.423	0.430	Be	Ca	Zn	Cd	Sn	Sn	Sn	Zr	2.349	0.180	Mg	Cd	Cd	Ti	Ti	Al	In	In	Sc	2.787	0.584	Zn	Zn	Ti	HF	Al	Sc	Sc	Y	3.254	0.894
Sr	Zn	Ge	Al	Ga	Ga	Ga	In	1.424	0.708	Be	Ca	Si	Ge	Ga	Y	Y	Y	2.349	0.186	Mg	Mg	Cd	Cd	Ge	Sn	Ti	HF	2.787	0.768	Mg	Mg	Zn	Cd	Si	Zr	Zr	HF	3.254	0.958	
Sr	Zn	Ge	Ti	In	In	In	Y	1.424	0.701	Mg	Mg	Sn	HF	Ga	In	In	Sc	2.349	0.567	Sr	Ba	Zr	HF	Al	Al	Al	Sc	2.787	0.961	Be	Ba	Zn	Ge	Ti	HF	HF	3.254	1.046		
Sr	Si	Ge	In	In	Y	Y	Y	1.425	0.457	Sr	Ba	Ti	Ti	Al	In	In	Sc	2.349	0.199	Zn	Cd	Sn	Zr	Al	Al	Al	Sc	2.787	0.527	Be	Mg	Cd	Cd	Sn	Ti	Ti	HF	3.254	0.921	
Ba	Cd	Sn	HF	In	In	Sc	Sc	1.425	0.691	Mg	Ba	Ti	HF	In	In	Sc	Sc	2.350	0.164	Be	Ba	Ti	HF	Sc	Y	Y	Y	2.787	0.599	Be	Ba	Zn	Cd	Ti	Ti	Ti	HF	3.254	0.893	
Be	Cd	Ge	Sn	Al	Al	In	In	1.425	0.679	Ca	Sr	Ti	Ti	In	In	Sc	Y	2.350	0.540	Zn	Cd	Sn	Ti	Al	Al	Al	Y	2.787	0.741	Mg	Ca	Zn	Cd	Ti	Ti	Ti	HF	3.254	1.097	
Be	Zn	Sn	Sn	Ga	In	Y	Y	1.425	0.501	Be	Sr	Ti	HF	In	Y	Y	Y	2.350	0.188	Be	Be	Sn	Zr	In	Sc	Y	Y	2.787	0.869	Mg	Sr	Sr	Zn	Ge	Zr	Zr	HF	3.254	0.953	
Sr	Ba	Cd	Cd	Si	Ge	Sn	Sn	1.426	0.836	Be	Ba	Sn	HF	Sc	Sc	Sc	Y	2.350	0.146	Be	Ca	Si	Si	Ga	In	Sc	Sc	2.788	0.825	Be	Ca	Ba	Zn	Ge	Ge	Ge	Ti	3.254	0.717	
Mg	Ca	Si	Sn	Ga	Ga	Ga	In	1.426	0.778	Mg	Sr	Sn	HF	Al	Al	Al	Sc	2.350	0.750	Ca	Ca	Sr	Cd	Si	Si	Sn	Ti	2.788	0.836	Ca	Zn	Ti	Ti	Al	Al	Ga	Sc	3.254	0.841	
Mg	Sr	Sn	Sn	Ga	Sc	Sc	Y	1.426	0.693	Zn	Cd	Ge	HF	Al	Al	Ga	Ga	2.350	0.156	Ba	Cd	Ge	Ti	Sc	Sc	Sc	Y	2.788	0.938	Mg	Mg	Ba	Zn	Si	Al	Ge	Ge	HF	3.255	0.873
Mg	Zn	Sn	Sn	In	In	Sc	Y	1.427	0.813	Ba	Cd	Ti	Ti	Ga	Ga	Y	Y	2.350	0.122	Ca	Cd	HF	HF	In	Sc	Y	Y	2.788	0.815	Mg	Ca	Cd	Si	Si	Ge	HF	3.255	0.704		
Mg	Zn	Ge	Sn	In	In	Sc	Sc	1.427	0.907	Ba	Ba	Ti	Cd	Si	Ge	Zr	HF	2.350	0.784	Ca	Zn	Si	Ge	In	Sc	Sc	Sc	2.788	0.870	Be	Sr	Zn	Cd	Si	Si	Si	Ge	3.255	0.840	
Be	Sr	Sn	HF	Ga	In	In	In	1.427	0.813	Sr	Cd	Ge	Zr	Al	Al	Sc	Sc	2.350	0.150	Be	Ba	Zr	HF	Ga	Ga	Ga	Sc	2.788	0.669	Ca	Ca	Sr	Zn	Ge	Ge	Ti	HF	3.255	1.035	
Mg	Ca	Si	Sn	In	In	Y	Y	1.427	0.617	Ca	Ba	Ge	Sn	Sc	Y	Y	Y	2.350	0.119	Ba	Cd	Ge	Ti	Sc	Sc	Y	Y	2.788	0.697	Mg	Zn	Sn	Ti	Sc	Sc	Y	Y	3.255	1.151	
Sr	Zn	Si	Sn	Ga	Ga	Ga	Y	1.427	0.840	Sr	Ba	Si	Ti	In	In	Sc	Sc	2.350	0.636	Zn	Zn	Sn	HF	Al	Al	Sc	Y	2.788	0.829	Mg	Cd	Zr	Zr	Al	Ga	Sc	Sc	3.255	1.201	
Mg	Ca	Ge	Ge	Al	In	In	Y	1.428	0.745	Be	Sr	Si	Si	Ga	Ga	In	Sc	2.350	0.397	Be	Ca	Sn	Cd	Cd	Si	Si	Zr	HF	2.788	0.613	Be	Be	Si	Ge	Al	Al	In	Y	3.255	1.157
Be	Sr	Sn	Ti																																					

Mg	Cd	Si	Sn	In	In	Y	Y	1.458	0.299	Sr	Ba	Ge	Ti	Ga	Ga	Y	Y	2.357	0.507	Mg	Ca	Ge	Zr	Al	Al	Al	Y	2.793	0.999	Be	Cd	Si	Ti	Ga	Ga	Sc	Sc	3.265	0.836	
Be	Zn	Ge	Sn	In	In	In	Y	1.458	0.111	Be	Ca	Ba	Cd	Sn	Sn	Hf	Hf	2.357	0.139	Mg	Ba	Ba	Cd	Si	Si	Ti	Hf	2.793	1.102	Mg	Ca	Cd	Si	Si	Ti	Hf	3.265	0.697		
Cd	Zn	Sn	Sn	Al	Al	Al	In	1.458	0.247	Sr	Cd	Si	Zr	Al	Al	Ga	Ga	2.358	0.283	Mg	Ba	Ba	Cd	Si	Si	Ge	Hf	2.793	0.978	Be	Be	Ca	Cd	Sn	Zr	Zr	Hf	3.265	0.724	
Ca	Zn	Ge	Ge	Ga	In	In	Sc	1.458	0.265	Sr	Ba	Hf	Hf	Al	In	In	Sc	2.358	0.523	Ca	Zn	Zr	Zr	Ga	Ga	In	Sc	2.793	1.027	Mg	Zn	Si	Ti	Al	Ga	Ga	Ga	3.265	0.803	
Mg	Ba	Sn	Zr	Ga	In	In	In	1.459	0.064	Ca	Ca	Zn	Cd	Si	Ge	Ge	Zr	2.358	0.120	Ca	Cd	Sn	Hf	Sc	Y	Y	Y	2.793	0.791	Mg	Mg	Si	Hf	Al	Al	In	Sc	3.265	0.836	
Mg	Ba	Sn	Zr	In	In	In	Sc	1.459	0.232	Mg	Sr	Ba	Cd	Sn	Sn	Hf	Sn	2.358	0.276	Sr	Ba	Si	Zr	In	Y	Y	Y	2.793	0.856	Ca	Cd	Si	Zr	Sc	Sc	Sc	Y	3.266	0.926	
Mg	Ba	Sn	Zr	In	In	In	Sc	1.459	0.258	Sr	Cn	Zn	Zr	Si	Ge	Sn	Hf	2.358	0.692	Mg	Ba	Si	Zr	Hf	Al	Al	Ga	Ga	2.793	0.979	Mg	Zn	Hf	Hf	Al	Al	Ga	Y	3.266	0.935
Sr	Ba	Sn	Hf	Al	In	In	In	1.460	0.056	Be	Mg	Cd	Cd	Si	Ge	Sn	Sn	2.358	0.506	Zn	Zn	Cd	Cd	Ge	Sn	Ti	Zr	2.793	0.699	Be	Ca	Zr	Hf	Al	Al	Sc	Sc	3.266	0.944	
Ba	Ba	Sn	Zr	Ga	In	In	Y	1.460	0.249	Mg	Cd	Si	Zr	Ga	In	In	In	2.358	0.528	Ca	Ba	Zr	Zr	Ga	Sc	Y	2.793	0.811	Be	Ca	Sn	Cd	Si	Si	Zr	Zr	3.266	0.843		
Ca	Sr	Ge	Ge	Ga	In	In	Sc	1.460	0.217	Mg	Ca	Si	Si	In	In	Sc	Y	2.358	0.543	Ca	Ca	Ba	Cd	Sn	Zr	Zr	Hf	2.793	1.031	Sr	Ba	Ba	Ba	Ge	Sn	Zr	Hf	3.266	0.870	
Zn	Cd	Sn	Hf	Ga	In	In	In	1.460	0.015	Zn	Cd	Ti	Ti	Al	In	In	Y	2.358	0.520	Mg	Zn	Si	Si	Al	In	In	Sc	2.793	1.026	Mg	Zn	Zr	Zr	Al	Ga	Ga	Y	3.266	0.877	
Ba	Zn	Sn	Zr	Ga	Ga	Y	Y	1.460	0.239	Ba	Ca	Ge	Hf	Ga	Ga	Ga	In	2.359	0.556	Mg	Zn	Cd	Cd	Ge	Ge	Sn	Ti	2.793	0.946	Be	Be	Mg	Ba	Sn	Sn	Zr	Hf	3.266	0.785	
Ca	Ba	Ge	Sn	Ga	Ga	Y	Y	1.461	0.206	Sr	Zn	Cd	Cd	Si	Sn	Ti	Ti	2.359	0.607	Be	Ba	Zr	Zr	Al	Al	Sc	Y	2.793	0.974	Be	Be	Be	Ba	Si	Ge	Ti	Hf	3.266	0.873	
Ba	Zn	Sn	Ti	Ga	In	In	Y	1.461	-0.001	Sr	Zn	Zr	Zr	Al	In	Y	Y	2.359	0.411	Be	Ba	Sr	Cd	Sn	Ti	Ti	Zr	2.793	0.742	Be	Mg	Ca	Ba	Sn	Sn	Sn	Ti	3.266	0.877	
Ba	Ba	Sn	Hf	Al	Ga	Ga	Y	1.461	0.405	Zn	Zn	Sn	Hf	Ga	In	In	Sc	2.359	0.528	Mg	Zn	Zr	Zr	Al	In	In	Y	2.793	0.816	Mg	Ca	Ba	Ba	Zn	Sn	Hf	Hf	3.266	0.933	
Mg	Ba	Si	Sn	Al	Ga	Ga	Ga	1.462	0.401	Zn	Zn	Ge	Ti	Al	In	Y	Y	2.359	0.623	Be	Sr	Si	Zn	Si	Sn	Sn	Hf	2.793	0.905	Be	Sr	Si	Ti	Sc	Sc	Sc	Y	3.266	0.953	
Ba	Cd	Sn	Hf	Al	Ga	Ga	Ga	1.463	0.021	Ca	Ba	Si	Si	Al	Ga	Ga	Sc	2.359	0.392	Be	Sr	Sr	Cd	Sn	Ti	Ti	Hf	2.793	0.689	Be	Cd	Cd	Cd	Si	Ge	Zr	Hf	3.266	0.847	
Cd	Cd	Si	Ge	Al	In	In	Y	1.463	0.304	Sr	Zn	Si	Sn	Ga	Sc	Sc	Sc	2.359	0.523	Mg	Cd	Zr	Zr	Al	Ga	Y	Y	2.793	0.781	Mg	Sr	Ba	Zn	Ti	Ti	Zr	Zr	3.266	0.883	
Ba	Zn	Ge	Ti	Ga	In	In	In	1.463	0.274	Sr	Zn	Ti	Hf	Al	Al	In	In	2.359	0.574	Be	Mg	Ba	Cd	Cd	Ge	Ge	Ge	Hf	2.794	0.959	Mg	Ca	Ti	Zr	Al	Al	Ga	Ga	3.266	0.974
Sr	Sr	Ge	Ge	Al	Ga	In	Sc	1.463	0.332	Ba	Ba	Zn	Zn	Si	Ge	Ti	Hf	2.359	0.837	Mg	Cd	Zr	Zr	Hf	In	Y	Y	Y	2.794	0.748	Be	Mg	Ca	Sr	Sn	Sn	Hf	Ga	3.266	0.846
Mg	Cd	Sn	Sn	Al	Ga	In	Y	1.463	0.294	Ca	Ca	Si	Ti	In	In	Sc	Y	2.359	0.799	Mg	Zn	Ge	Sn	Sc	Sc	Y	Y	2.794	0.955	Be	Sr	Sr	Ba	Si	Si	Ge	Sn	3.266	0.845	
Ba	Ba	Sn	Ti	Al	Ga	In	Y	1.464	0.264	Zn	Cd	Ge	Ti	Ga	Ga	Ga	Ga	2.359	0.634	Be	Ca	Sr	Sn	Sn	Sn	Sn	Zr	2.794	1.024	Be	Zn	Zr	Zr	Al	Al	Sc	Y	3.267	0.921	
Ca	Sr	Si	Sn	Ga	Ga	Ga	Sc	1.464	0.317	Mg	Ba	Si	Sn	Sc	Sc	Sc	Y	2.359	0.762	Ca	Ca	Ba	Cd	Ge	Zr	Zr	Hf	2.794	0.675	Be	Mg	Ge	Ge	Al	Sc	Sc	Y	3.267	0.840	
Sr	Cd	Sn	Hf	Ga	Ga	Y	Y	1.465	0.439	Cd	Cd	Sn	Zr	Ga	Sc	Y	Y	2.360	0.784	Be	Ca	Si	Ti	In	Y	Y	Y	2.794	0.916	Be	Mg	Ti	Ti	Al	Ga	In	In	3.267	0.838	
Cd	Cd	Ge	Hf	Al	Ga	In	In	1.465	0.435	Mg	Zn	Ge	Al	Ga	Ga	Y	Y	2.360	0.649	Ca	Sr	Ge	Ti	Al	Al	Y	Y	Y	2.794	1.096	Be	Mg	Ti	Zr	In	In	Sc	Sc	3.267	0.832
Ba	Zn	Sn	Sn	In	Sc	Y	Y	1.465	0.335	Sr	Sr	Si	Ge	Ga	Sc	Sc	Y	2.360	0.747	Be	Mg	Si	Si	Ga	In	Y	Y	Y	2.794	0.623	Be	Be	Mg	Ba	Si	Si	Sn	Ti	3.267	0.702
Be	Sr	Sn	Hf	Al	In	In	In	1.466	0.374	Ca	Zn	Sn	Hf	Al	Al	Al	In	2.360	0.781	Ca	Sr	Ti	Hf	Al	Al	Ga	Ga	Ga	2.794	0.721	Mg	Ca	Ca	Zn	Sn	Ti	Hf	3.267	0.796	
Ca	Ca	Ge	Sn	Al	Al	Ga	Y	1.466	0.364	Sr	Zn	Zr	Zr	In	In	In	Sc	Y	2.360	0.306	Be	Mg	Sn	Hf	Ga	Ga	Ga	Y	2.794	0.861	Be	Be	Mg	Sr	Si	Ge	Sn	3.267	0.852	
Ca	Ca	Ge	Sn	Al	Ga	In	Sc	1.467	0.232	Be	Cd	Hf	Hf	Ga	In	Y	Y	2.360	0.209	Be	Ca	Sn	Hf	Al	Al	Al	Sc	2.794	0.825	Be	Cd	Si	Ge	Sc	Sc	Y	3.267	0.703		
Sr	Ba	Sn	Zr	In	In	In	Sc	1.467	0.340	Ca	Sr	Sr	Cd	Sn	Sn	Zr	Hf	2.360	0.204	Ca	Ba	Zr	Zr	Al	Al	Ga	Sc	2.794	0.811	Be	Zn	Zr	Zr	Al	Al	Ga	3.268	0.786		
Zn	Cd	Ge	Ge	Ga	Ga	In	Y	1.467	0.232	Be	Ca	Ge	Ge	Ga	Sc	Sc	Y	2.360	0.324	Be	Sr	Zr	Hf	Ga	Ga	Sc	Sc	2.794	0.807	Mg	Sr	Sr	Zn	Si	Ti	Zr	Zr	3.268	0.853	
Cd	Cd	Ge	Ga	Ga	Sc	Y	Y	1.468	0.169	Mg	Ba	Ba	Cd	Si	Sn	Sn	Ti	2.360	0.203	Be	Cd	Ti	Hf	In	In	Sc	Sc	2.796	0.903	Sr	Zn	Ti	Zr	Si	Y	Y	Y	3.268	0.713	
Be	Sr	Sn	Zr	Ga	In	In	In	1.468	0.346	Mg	Ca	Ba	Sn	Zn	Al	Ga	Ga	2.360	0.198	Mg	Ca	Zr	Hf	In	Y	Y	Y	2.795	0.806	Be	Mg	Zr	Hf	Sc	Y	Y	Y	3.268	0.741	
Mg	Ba	Sn	Zr	Al	In	In	In	1.469	0.325	Sr	Ba	Hf	Hf	Ga	In	Y	Y	2.360	0.239	Sr	Zn	Si	Zr	Al	Al	Sc	Sc	2.795	0.798	Be	Ca	Ba	Ba	Zn	Si	Ti	Ti	3.268	0.820	
Mg	Sr	Ge	Sn	Al	Al	Ga	Ga	1.469	0.255	Sr	Sr	Zn	Cd	Ge	Ti	Hf	Hf	2.361	0.221	Ca	Zn	Ti	Ti	Ti	Al	Ga	In	2.795	0.704	Be	Cd	Si	Ti	Ga	Ga	Sc	3.268	0.849		
Be	Sr	Ge	Ge	Al	Ga	In	In	1.469	0.285	Ca	Zn	Si	Hf	In	In	In	Sc	Sc	2.361	0.216	Mg	Mg	Zn	Cd	Si	Si	Sn	Hf	2.795	0.673	Zn	Zn	Ti	Hf	Al	Al	Ga	Sc	3.268	0.971
Mg	Sr	Si	Sn	Al	Al	In	In	1.470	0.294	Be	Sr	Sr	Cd	Cd	Ge	Ge	Sn	Hf	2.361	0.654	Ca	Ca	Sr	Cd	Si	Ti	Hf	Hf	2.795	0.732	Mg	Mg	Ca	Ba	Ge	Sn	Sn	Hf	3.268	0.958
Ca	Sr	Ge	Sn	Ga	Ga	Y	Y	1.470	0.226	Ba	Ba	Ti	Hf	Ga	Ga	In	Y	2.361	0.532	Mg	Ba	Ba	Ba	Zn	Ge	Sn	Sn	Hf	2.795	0.681	Be	Be	Ge	Hf	Al	Ga	Ga	In	3.268	0.978
Sr	Sr	Sn	Ti	Al	In	In	Y	1.471	0.273	Sr	Cd	Si	Ge	Al	Al	Al	Ga	2.361	0.566	Mg	Ba	Ba	Cd	Cd	Si	Si	Ti	Zr	2.795	0.637	Be	Ca	Ba	Ba	Zn	Si	Si	Zr	3.268	0.887
Ca	Cd	Sn	Zr	In	In	In	Sc	1.472	0.288	Be	Sr	Sn	Zr	Al	Y	Y	Y	2.361	0.757	Zn	Cd	Zr	Zr	Hf	Ga	Ga	Y	Y	2.795	0.746	Mg	Sr	Si	Zr	Al	Sc	Sc	Sc	3.268	0.883
Mg	Ca	Sn	Sn	Al	In	In	Sc	1.472	0.220	Be	Sr	Sr	Cd	Si	Sn	Hf	Hf	2.361	0.450	Be	Sr	Ba	Cd	Cd	Ti	Zr	Zr	Zr	2.795	0.839	Mg	Sn	Cd	Cd	Sn	Ti	Ti	Hf	3.269	0.906
Sr	Zn	Ge	Zr	Ga	In	In	In	1.473	0.544	Cd	Cd	Ti	Ti	Al	Ga	In	Y	2.361	0.505	Be	Be	Ba	Cd	Cd	Si	Ti	Ti	Zr	2.795	0.740	Be	Cd	Si	Ge	Al	Al	Y	3.269	0.827	
Mg	Ba	Sn	Ti	In	In	In	Sc	1.473	0.609	Be	Mg	Sr	Cd	Sn	Sn	Sn	Hf	2.361	0.616	Mg	Zn	Si	Hf	Ga	Ga	Ga	In	2.795	0.729	Be	Cd	Si	Si	Al	Sc	Y	Y	3.269	0.863	
Ca	Sr	Sn	Hf	In	In	In	Sc	1.475	0.353	Sr	Sr	Si	Si	Al	In	Sc	Y	2.361	0.412	Mg	Sr	Sn	Ti	Sc	Sc	Sc	Y	2.795	0.674	Be	Mg	Ca	Cd	Zr	Zr	Hf	Hf	3.269	0.883	
Cd	Cd	Sn	Zr	Ga	In	In	Y	1.475	0.495	Be	Ca	Cd	Cd	Ge	Sn	Sn	Zr	2.361	0.483	Mg	Mg	Ge	Si	Al	In	In	Sc	2.795	0.599	Ca	Cd	Ti	Zr	Al	Al	Al	Sc	3.269	0.977	
Mg	Ca	Sn	Sn	Al</																																				

Mg	Ba	Ge	Sn	In	Y	Y	Y	1.497	0.134	Ca	Sr	Zn	Zn	Ge	Sn	Sn	Zr	2.366	0.646	Mg	Sr	Si	Si	Al	Ga	Y	Y	2.802	0.415	Be	Be	Mg	Zn	Ge	Zr	Hf	Hf	3.278	0.539	
Ca	Ca	Ge	Sn	Al	Al	Ga	In	1.497	0.370	Ba	Cd	Sn	Hf	Al	Y	Y	Y	2.366	0.676	Ca	Zn	Cd	Cd	Si	Si	Ti	Hf	2.802	0.327	Mg	Mg	Si	Hf	Ga	Sc	Y	Y	3.279	0.347	
Be	Zn	Si	Ge	In	In	In	In	1.498	0.333	Ba	Cd	Zn	Zn	Ge	Sn	Hf	Hf	2.367	0.865	Ca	Ca	Ti	Hf	Al	In	Sc	Sc	2.802	0.712	Ca	Cd	Si	Hf	Sc	Y	Y	Y	3.279	0.413	
Ca	Sr	Ge	Hf	In	In	In	Y	1.498	0.104	Mg	Ba	Ba	Cd	Ge	Sn	Hf		2.366	0.567	Mg	Ba	Ti	Ti	Al	Al	In	Sc	2.802	1.215	Mg	Mg	Zr	Zr	Ga	Ga	Sc	Y	3.279	0.315	
Ca	Zn	Sn	Hf	Al	In	In	In	1.498	0.372	Sr	Ba	Ba	Cd	Si	Si	Ge	Sn	2.367	0.615	Mg	Ba	Ba	Zn	Ge	Sn	Sn	Zr	2.802	1.081	Mg	Ga	Ca	Cd	Si	Ti	Zr		3.279	0.525	
Zn	Cd	Ge	Sn	Al	Al	Ga	In	1.498	0.332	Ba	Ba	Zn	Cd	Si	Ti	Ti	Hf	2.367	0.714	Mg	Mg	Ge	Sn	Al	Al	Sc	Sc	Y	2.802	1.121	Mg	Mg	Ti	Ti	Ga	Ga	Sc	Y	3.279	0.454
Sr	Cd	Ge	Ge	Al	In	In	Sc	1.499	0.097	Mg	Ca	Si	Ge	Al	Ga	Ga	Ga	2.367	0.519	Be	Sr	Ba	Cd	Ti	Hf	Hf	Hf	2.802	0.564	Be	Be	Zn	Cd	Si	Ti	Ti	Zr	3.279	0.360	
Mg	Sr	Ge	Ge	Al	Al	Ga	Y	1.500	0.573	Ca	Ca	Ge	Ti	Al	Ga	Ga	Sc	2.367	0.595	Mg	Mg	Sn	Hf	Ga	Sc	Y	Y	2.802	0.557	Be	Be	Be	Sr	Ge	Zr	Hf		3.279	0.421	
Ba	Zn	Ge	Ge	Al	Al	In	Y	1.500	0.567	Mg	Ba	Zn	Cd	Si	Si	Ti	Zr	2.367	0.753	Mg	Ba	Si	Zr	Ga	Y	Y	Y	2.802	0.904	Be	Zn	Zn	Zn	Ge	Sn	Zr	Hf	3.279	0.624	
Cd	Cd	Si	Ge	Ga	In	In	Sc	1.500	0.134	Sr	Zr	Cd	Cd	Si	Ge	Ge	Ti	2.367	0.373	Ca	Ba	Ge	Ti	Ga	Y	Y	Y	2.802	0.541	Ca	Sr	Zr	Zi	Ge	Ge	Ti	Zr	3.280	0.452	
Ba	Ba	Sn	Hf	In	In	Sc	Y	1.500	0.413	Mg	Cd	Sn	Hf	Ga	Ga	Sc		2.367	0.530	Zn	Zn	Si	Hf	Ga	Ga	Sc	Y	2.802	0.465	Be	Be	Ba	Zn	Si	Ti	Hf		3.280	0.614	
Mg	Ca	Si	Ge	Ga	In	In	In	1.500	0.377	Ca	Ba	Sn	Ti	Al	Al	Al	Ga	2.368	0.764	Zn	Cd	Si	Zr	In	Y	Y	Y	2.802	0.921	Be	Ca	Sr	Zn	Ge	Ge	Hf		3.280	0.680	
Be	Ba	Ge	Ti	In	In	In	Y	1.500	0.518	Ca	Sr	Sr	Cd	Ge	Sn	Hf	Hf	2.368	0.349	Ca	Ca	Ti	Zr	Ga	In	Sc	Sc	2.802	0.607	Be	Ca	Hf	Hf	Al	Al	Ga	Sc	3.280	0.493	
Sr	Zn	Sn	Hf	Ga	Ga	Y	Y	1.500	0.415	Ca	Sr	Sn	Ti	Ti	Ga	Ga	In	2.368	0.520	Ca	Cd	Zr	Hf	In	Y	Y	Y	2.802	0.791	Mg	Zn	Ti	Ti	Ga	Sc	Y	Y	3.280	0.413	
Be	Cd	Si	Sn	In	In	Y	Y	1.501	0.376	Ba	Zn	Cd	Cd	Si	Ge	Ti	Ti	2.368	0.954	Mg	Mg	Ge	Hf	Al	Ga	Y	Y	2.802	1.092	Mg	Zn	Ge	Zr	In	Sc	Sc	Sc	3.280	0.316	
Be	Ba	Ge	Ge	Al	Ga	Ga	Y	1.501	0.512	Sr	Zn	Si	Ge	Ga	Y	Y	Y	2.368	0.777	Be	Ba	Zn	Zn	Ga	Y	Y	Y	2.802	0.565	Be	Ba	Zn	Zn	Sn	Zr	Zr	Hf	3.280	0.321	
Be	Ca	Sn	Sn	Al	Ga	Y	Y	1.501	0.595	Be	Sr	Sn	Ti	Al	Al	Al	In	2.368	0.798	Ca	Ca	Ca	Cd	Si	Ge	Ge	Hf	2.802	0.699	Mg	Mg	Mg	Cd	Sn	Ti	Zr	Hf	3.280	0.469	
Sr	Sr	Sr	Hf	Al	In	In	Sc	1.501	0.589	Ba	Ba	Si	Ge	In	Sc	Y	Y	2.368	0.830	Ca	Ca	Hf	Hf	Al	Ga	Sc	Y	2.803	1.128	Zn	Zn	Si	Ti	In	Sc	Sc	Y	3.280	0.669	
Ba	Cd	Sn	Ti	Al	Al	In	In	1.502	0.552	Be	Sr	Si	Ti	In	In	Sc	Sc	2.368	0.785	Zn	Cd	Ge	Hf	Al	Al	Al	Y	2.803	0.289	Be	Be	Be	Zn	Si	Ge	Zr	Hf	3.280	0.578	
Be	Ba	Si	Sn	Ga	Ga	Y	Y	1.502	0.455	Ba	Cd	Ge	Zr	In	Y	Y	Y	2.368	0.823	Be	Be	Ba	Cd	Ge	Ti	Ti	Hf	2.803	0.296	Mg	Ca	Ti	Hf	Ga	Sc	Sc	Sc	3.280	0.645	
Mg	Sr	Si	Sn	Ga	Ga	Ga	Sc	1.502	0.445	Be	Ca	Cd	Cd	Sn	Sn	Zr	Hf	2.368	0.867	Ba	Cd	Ti	Zr	Al	Al	Sc	Sc	2.803	0.466	Ca	Sr	Ba	Zn	Ti	Hf	Hf	Hf	3.280	0.715	
Be	Cd	Sn	Sn	Al	Al	Ga	In	1.502	0.291	Mg	Sr	Hf	Hf	Ga	Ga	In	Y	2.368	0.645	Mg	Ca	Ba	Cd	Sn	Hf	Hf	Hf	2.803	1.198	Be	Mg	Ba	Zn	Ti	Ti	Hf	Hf	3.280	0.604	
Ba	Zn	Sn	Zr	Ga	Ga	Ga	Y	1.502	-0.236	Sr	Zn	Zn	Cd	Si	Si	Ge	Zr	2.368	0.776	Zn	Cd	Sn	Hf	Al	Sc	Sc	Sc	2.803	1.134	Zn	Cd	Si	Hf	Sc	Sc	Sc	Y	3.280	0.466	
Ba	Cd	Ge	Sn	Al	Al	Y	Y	1.503	-0.281	Mg	Mg	Sn	Hf	Al	In	In	Sc	2.368	0.878	Mg	Sr	Ge	Zr	Ga	Sc	Sc	Sc	2.803	1.025	Be	Ca	Si	Ti	Ga	Y	Y	Y	3.280	0.375	
Mg	Sr	Sn	Sn	Ga	Sc	Y	Y	1.503	-0.408	Ca	Sr	Zn	Cd	Si	Si	Hf	Hf	2.368	0.621	Be	Sr	Sr	Cd	Si	Ge	Ge	Hf	2.803	1.285	Be	Zn	Ti	Ti	Ga	In	Sc	Sc	3.280	0.425	
Ca	Sr	Sn	Sn	Ga	Sc	Sc	Y	1.503	-0.276	Be	Sr	Sn	Hf	Ga	Ga	Sc	Sc	2.368	0.768	Mg	Zn	Ti	Hf	Ga	Ga	Y	Y	2.803	1.104	Mg	Zn	Si	Ge	Ga	Sc	Sc	Sc	3.281	0.521	
Be	Ba	Ge	Sn	Al	Al	Al	In	1.504	-0.298	Mg	Zn	Sn	Hf	In	In	Sc	Sc	2.369	0.876	Mg	Ba	Cd	Cd	Si	Ti	Zr	Zr	2.803	1.048	Be	Ca	Ca	Zn	Si	Sn	Ti	Ti	3.281	0.450	
Sr	Zn	Ge	Sn	Ga	Ga	Sc	Sc	1.504	-0.432	Be	Sr	Ge	Ti	Al	Ga	Ga	Ga	2.369	1.107	Be	Ca	Zn	Cd	Ge	Ge	Hf	Hf	2.803	0.674	Mg	Zn	Zn	Cd	Ti	Ti	Zr	Hf	3.281	0.652	
Sr	Ba	Ge	Zr	In	In	In	Y	1.504	-0.290	Ca	Cd	Ge	Sn	Sc	Sc	Y	Y	2.369	1.071	Mg	Ca	Ca	Cd	Si	Si	Ge	Sn	2.803	0.630	Mg	Sr	Si	Zr	Sc	Sc	Y	Y	3.281	0.827	
Ca	Ba	Ge	Sn	Ga	Ga	Sc	Sc	1.504	-0.311	Ca	Sr	Cd	Cd	Si	Si	Ge	Hf	2.369	0.910	Sr	Zn	Hf	Hf	Al	Ga	Sc	Sc	2.803	0.875	Mg	Ca	Zn	Zn	Sn	Ti	Zr		3.281	0.679	
Ba	Cd	Si	Ge	Ga	Ga	Ga	Y	1.506	-0.443	Sr	Cd	Si	Al	In	In	Sc	Sc	2.369	1.002	Be	Be	Sn	Ti	Al	In	In	Y	2.803	0.603	Ca	Zn	Si	Hf	Sc	Sc	Sc	Y	3.281	0.607	
Be	Ca	Si	Ge	Ga	In	In	In	1.506	-0.292	Ca	Ca	Ti	Hf	Al	In	In	Y	2.369	1.038	Be	Be	Si	Sn	Al	In	In	Sc	2.804	0.520	Be	Zn	Si	Hf	Ga	Ga	Sc	Sc	3.281	0.505	
Be	Mg	Sn	Sn	Ga	Ga	In	Y	1.506	-0.312	Zn	Cd	Ti	Ti	Ga	In	Y	Y	2.369	0.920	Mg	Ba	Si	Si	Ga	Sc	Sc	Y	2.804	0.895	Be	Ca	Cd	Cd	Ge	Ti	Ti	Ti	3.281	0.512	
Ba	Zn	Ge	Zr	Ga	Ga	In	In	1.506	-0.444	Ba	Ba	Zr	Hf	Ga	In	Y	Y	2.369	0.982	Sr	Cd	Ti	Ti	Al	Al	Ga	Sc	2.804	1.321	Be	Mg	Ca	Cd	Zr	Zr	Zr	Hf	3.281	0.449	
Be	Zn	Ge	Sn	Ga	Ga	In	In	1.507	0.011	Ca	Zn	Zn	Cd	Sn	Sn	Ti	Hf	2.369	1.032	Ca	Ba	Cd	Cd	Ti	Zr	Hf	Hf	2.804	1.192	Mg	Zn	Ti	Hf	Al	Ga	Ga	Ga	3.281	0.675	
Be	Ba	Ge	Ge	In	In	Sc	Sc	1.507	-0.002	Ba	Ba	Ba	Cd	Si	Sn	Sn	Hf	2.369	0.560	Be	Be	Be	Sr	Si	Ge	Sn	Hf	2.804	1.234	Mg	Ba	Ca	Zn	Sn	Sn	Ti	Zr	3.281	0.558	
Ca	Cd	Sn	Zr	In	In	Y	Y	1.507	-0.402	Be	Be	Sn	Zr	Ga	In	Y	Y	2.369	0.460	Be	Ba	Ti	Zr	Al	Al	Al	In	2.804	0.757	Mg	Cd	Si	Si	Al	Ga	Sc	Sc	3.282	0.499	
Ba	Cd	Si	Ge	Al	Al	In	In	1.508	0.017	Zn	Cd	Sn	Zr	In	Y	Y	Y	2.369	0.464	Sr	Zn	Si	Hf	Al	Al	Al	Sc	2.804	0.730	Mg	Zn	Si	Al	In	In	Sc	Sc	3.282	0.558	
Be	Ba	Sn	Ti	In	In	Y	Y	1.508	-0.010	Be	Sr	Sr	Cd	Ge	Sn	Hf	Hf	2.370	0.573	Zn	Cd	Zr	Zr	Ga	In	Sc	Sc	2.804	1.041	Be	Be	Mg	Cd	Ge	Sn	Sc	Ti	3.282	0.692	
Ca	Ca	Si	Sn	Hf	Ga	In	In	1.508	-0.422	Sr	Sr	Ti	Hf	Al	Ga	Ga	Y	2.370	0.449	Mg	Cd	Si	Si	Al	Al	Ga	In	2.804	0.722	Sr	Sr	Ba	Ba	Ge	Sn	Ti	Zr	3.282	0.574	
Ca	Zn	Sn	Hf	Ga	In	In	In	1.508	0.018	Be	Ba	Bz	Zr	In	Sc	Y	Y	2.370	0.454	Mg	Sr	Cd	Cd	Ge	Ti	Zr	Zr	2.804	0.633	Mg	Mg	Ca	Cd	Ti	Ti	Zr	Hf	3.283	0.742	
Zn	Zn	Ge	Sn	Al	In	In	Sc	1.508	-0.010	Ba	Ba	Si	Ti	Al	Ga	Ga	Sc	2.370	0.481	Sr	Cd	Zr	Zr	In	Sc	Sc	Y	2.804	1.057	Mg	Ca	Si	Zr	Al	Y	Y	Y	3.283	0.753	
Be	Zn	Sn	Al	In	In	Y		1.508	-0.424	Zn	Cd	Sn	Ti	Ga	Ga	Ga	Sc	2.370	0.464	Ca	Ca	Ba	Cd	Si	Zr	Zr	Hf	2.804	0.800	Be	Mg	Mg	Ba	Si	Sn	Hf	Hf	3.283	0.619	
Sr	Sr	Sn	Hf	In	In	Sc	Y	1.509	-0.039	Ba	Ba	Ti	Hf	Ga	In	Y	Y	2.370	0.460	Ba	Zn	Ti	Zr	Ga	Y	Y	Y	2.805	0.961	Ca	Sr	Sr	Zn	Si	Si	Ge	Hf	3.283	0.597	
Ba	Cd	Ge	Hf	Ga	Ga	Ga	Y	1.509	-0.095	Ba	Ba	Si	Hf	Al	In	Sc	Sc	2.370	0.335	Cd	Cd	Si	Hf	Al	Al	Sc	Y	2.805	1.226	Be	Ca	Ca	Cd	Si	Si	Ti	Hf	3.283	0.508	
Be	Ba	Ge	Sn	In	In	Sc	Sc	1.																																

Sr	Sr	Si	Sn	Al	Al	In	Y	1.529	0.649	Ca	Sr	Ba	Cd	Ge	Ge	Ge	Sn	2.376	0.427	Cd	Cd	Si	Hf	Ga	Sc	Y	Y	2.809	0.575	Ca	Cd	Ti	Zr	Ga	Sc	Sc	Sc	3.291	0.530	
Cd	Cd	Sn	Ti	Al	In	In	Y	1.529	0.632	Mg	Cd	Ti	Hf	In	In	Y	Y	2.376	0.523	Bd	Be	Sn	Ti	Al	Ga	Y	Y	2.810	0.665	Mg	Mg	Hf	Hf	Al	Ga	Sc	Y	3.291	0.725	
Ca	Ba	Ge	Zr	In	In	In	Y	1.530	0.084	Ca	Ba	Cd	Cd	Si	Si	Ge	Ge	2.376	0.420	Bd	Be	Ba	Cd	Ge	Ge	Y	Zr	2.810	0.646	Be	Mg	Ti	Ti	Ga	In	In	Sc	3.291	0.544	
Ca	Sr	Sn	Zr	In	In	In	Sc	1.530	0.369	Be	Sr	Ge	Hf	Al	Al	Ga	Ga	2.376	0.421	Cd	Cd	Si	Zr	Al	Ga	Sc	Sc	2.810	0.547	Ca	Ca	Sr	Zn	Si	Ti	Zr	Zr	3.291	0.720	
Sr	Cd	Sn	Zr	Ga	Ga	Ga	Y	1.530	0.269	Be	Ba	Zr	Zr	Al	Ga	In	In	2.376	0.429	Ca	Zn	Ti	Hf	Al	Al	Y	Y	2.810	0.719	Mg	Cd	Ti	Ti	Al	Ga	Ga	Sc	3.291	0.787	
Sr	Ba	Ge	Ge	Al	Al	Ga	Y	1.530	0.331	Sr	Cd	Ti	Ti	Ga	Ga	In	Sc	2.376	0.413	Be	Zn	Ti	Zn	Ga	In	In	Y	2.810	0.648	Be	Sr	Si	Ti	Al	Sc	Sc	Sc	3.291	0.590	
Sr	Zn	Ge	Hf	Ga	Ga	Ga	In	1.531	0.381	Sr	Cd	Ti	Zr	Al	Ga	Ga	Ga	2.376	0.410	Sr	Sr	Zn	Zn	Ge	Ti	Zr	Hf	2.810	0.747	Be	Ca	Cd	Si	Si	Ti	Zr	Zr	3.291	0.471	
Ca	Ba	Sn	Ti	In	In	In	Sc	1.531	0.267	Ba	Ba	Zn	Zn	Si	Ge	Ti	Zr	2.376	0.820	Mg	Ba	Ti	Hf	Al	Al	Al	In	2.810	0.808	Be	Zn	Cd	Cd	Si	Ge	Zr	Zr	3.291	0.380	
Be	Sr	Ge	Sn	Ga	Y	Y	Y	1.531	0.325	Ba	Ba	Ti	Hf	Al	Ga	In	In	2.377	0.702	Be	Zn	Si	Si	Ga	In	In	Sc	2.810	0.639	Zn	Cd	Ti	Hf	Al	Al	Sc	Sc	3.291	0.427	
Be	Sr	Ge	Sn	Ga	Ga	Sc	Sc	1.531	0.604	Mg	Mg	Zn	Cd	Ge	Sn	Hf	Hf	2.377	0.745	Sr	Zn	Si	Ti	In	Y	Y	Y	2.810	0.715	Mg	Zn	Cd	Cd	Sn	Ti	Ti	Zr	3.291	0.572	
Ca	Sr	Sn	Sn	In	Sc	Y	Y	1.532	0.587	Mg	Mg	Ge	Sn	Al	Ga	Ge	Sc	2.377	0.911	Mg	Cd	Cd	Cd	Ge	Sn	Zr	Hf	2.810	0.882	Mg	Sr	Zn	Cd	Ti	Hf	Hf	Hf	3.291	0.764	
Ca	Ba	Sn	Hf	Ga	Ga	In	In	1.532	0.415	Ca	Ca	Zn	Cd	Ge	Ge	Ti	Zr	2.377	0.615	Be	Ca	Si	Zr	Ga	Ga	Ga	Y	2.810	0.580	Mg	Ba	Zn	Zn	Si	Ti	Hf	Hf	3.292	0.683	
Mg	Sr	Sn	Zr	Ga	In	In	In	1.532	0.526	Sr	Sr	Hf	Hf	Ga	In	Sc	Y	2.377	0.684	Ca	Ca	Sr	Cd	Ge	Ge	Sn	Hf	2.810	0.620	Ca	Zn	Ti	Ti	Al	Sc	Y	Y	3.292	0.746	
Mg	Sr	Ge	Sn	Ga	Ga	Sc	Sc	1.532	0.505	Mg	Sr	Sn	Hf	Al	Al	Al	Ga	2.377	0.800	Be	Zn	Zn	Cd	Ge	Ge	Sn	Hf	2.810	0.756	Ca	Ca	Sr	Zn	Sn	Ti	Zr	Zr	3.292	0.816	
Ca	Zn	Sn	Ti	In	In	In	Y	1.533	0.310	Be	Ca	Ba	Cd	Sn	Sn	Zr	Zr	2.377	0.616	Ba	Cd	Si	Ti	Ga	Y	Y	Y	2.810	1.371	Mg	Ba	Cd	Zn	Si	Si	Ge	Hf	3.292	0.715	
Be	Sr	Sn	Zr	In	In	In	Y	1.534	0.510	Be	Cd	Si	Ti	Ga	Ga	In	In	2.377	0.681	Be	Cd	Ge	Sn	Al	Ga	Ga	In	2.810	1.288	Ca	Cd	Si	Ti	Al	Y	Y	Y	3.292	0.517	
Sr	Sr	Si	Sn	Al	Al	Ga	Y	1.535	0.470	Be	Ba	Si	Zr	Ga	Ga	Ga	Y	2.377	0.833	Be	Be	Ba	Zn	Si	Si	Ge	Sn	2.811	1.183	Ca	Cd	Ti	Hf	Sc	Sc	Sc	Y	3.292	0.433	
Cd	Cd	Sn	Hf	Al	Ga	Ga	In	1.535	0.340	Ba	Cd	Cd	Cd	Zi	Si	Ti	Zr	Hf	2.377	0.484	Mg	Sr	Si	Ti	In	Y	Y	Y	2.811	1.451	Mg	Mg	Sr	Cd	Si	Ge	Ti	Ti	3.292	0.545
Sr	Cd	Ge	Ge	Al	Ga	Ga	Y	1.535	0.513	Ca	Sr	Zr	Zr	Ga	In	In	Y	2.377	0.623	Mg	Sr	Zr	Hf	Al	Y	Y	Y	2.811	1.259	Mg	Ca	Ca	Zn	Ge	Ge	Sn	Zr	3.292	0.574	
Zn	Cd	Si	Ge	In	In	In	Sc	1.535	0.479	Ca	Cd	Sn	Hf	Al	Al	Al	Sc	2.378	0.843	Mg	Ba	Ti	Zr	Ga	Ga	Sc	Sc	2.811	1.214	Be	Mg	Ba	Zn	Ti	Hf	Hf	Hf	3.292	0.510	
Ca	Cd	Ge	Ti	In	In	In	Y	1.536	0.341	Mg	Cd	Si	Ti	In	In	Y	Y	2.378	0.461	Sr	Sr	Ba	Zn	Ge	Sn	Sn	Hf	2.811	0.784	Mg	Ca	Zn	Si	Ge	Sn	Sc	3.292	0.762		
Zn	Cd	Sn	Zr	In	In	In	Y	1.536	0.465	Be	Be	Sn	Cd	Al	In	Y	Y	2.378	0.614	Mg	Sr	Ba	Cd	Cd	Sn	Ti	Ti	2.811	0.786	Be	Ca	Zn	Cd	Ti	Ti	Hf	Hf	3.293	0.922	
Zn	Cd	Ge	Ge	Al	In	In	Sc	1.537	0.458	Be	Sr	Sr	Cd	Si	Sn	Zr	Zr	2.378	1.019	Mg	Ca	Ca	Cd	Sn	Si	Ti	Hf	2.811	1.044	Be	Mg	Mg	Zn	Ge	Sn	Hf	Hf	3.293	0.781	
Ca	Cd	Si	Sn	Al	Al	In	In	1.538	0.322	Ba	Cd	Sn	Zr	Ga	Sc	Sc	Sc	2.378	0.843	Be	Sr	Ba	Cd	Cd	Si	Si	Ti	2.811	0.675	Be	Mg	Mg	Cd	Si	Ti	Ti	Zr	3.293	0.692	
Ca	Cd	Sn	Ti	Ga	Ga	In	In	1.538	0.456	Ba	Zn	Zn	Cd	Cd	Ge	Ti	Zr	Zr	2.378	0.870	Be	Be	Cd	Cd	Si	Ge	Sn	Ti	2.811	0.669	Be	Ca	Si	Zr	Al	Al	Al	Y	3.293	0.611
Ba	Zn	Si	Sn	Al	Ga	Ga	Ga	1.540	0.454	Be	Mg	Ge	Ge	Al	Ga	In	In	2.378	0.935	Ca	Zn	Cd	Cd	Si	Si	Ge	Ti	2.811	1.070	Be	Mg	Sr	Zn	Sn	Sn	Ti	Ti	3.293	0.616	
Sr	Zn	Sn	Ti	Ga	Ga	In	In	1.541	0.319	Zn	Zn	Ge	Ti	In	In	Sc	Y	2.378	0.902	Be	Cd	Zr	Zr	Al	Ga	Ga	In	2.811	1.481	Be	Mg	Sr	Zn	Si	Hf	Hf	Hf	3.293	0.534	
Sr	Ba	Sn	Ti	Al	In	In	In	1.541	0.795	Be	Ba	Ge	Zr	In	In	Sc	Sc	2.378	0.912	Be	Be	Ge	Sn	In	Sc	Sc	Y	2.811	1.362	Mg	Ca	Ba	Zn	Si	Si	Ge	Ge	3.293	0.778	
Ba	Zn	Ge	Ge	Ga	Ga	In	Sc	1.541	0.766	Be	Ba	Ba	Zn	Si	Ge	Ge	Sn	2.378	0.967	Ca	Zn	Ge	Ti	Al	Al	Al	In	2.812	1.412	Be	Ca	Sr	Zn	Ge	Ge	Zr	3.293	0.668		
Sr	Cd	Sn	Sn	Ga	Sc	Y	Y	1.541	0.365	Zn	Cd	Ge	Ti	In	In	Sc	Sc	2.379	0.775	Be	Mg	Ba	Zn	Ge	Ge	Ge	Sn	2.812	0.860	Be	Zn	Zn	Cd	Si	Ge	Hf	Hf	3.294	0.590	
Ba	Zn	Si	Zr	In	In	In	Y	1.542	0.766	Sr	Sr	Si	Ge	In	Sc	Y	Y	2.379	0.872	Sr	Ba	Zr	Zr	Ga	Sc	Y	Y	2.812	0.902	Be	Be	Sr	Ba	Ti	Ti	Zr	Hf	3.294	0.653	
Cd	Cd	Ge	Ge	Al	Ga	In	Sc	1.542	0.750	Mg	Ba	Si	Hf	Al	Al	In	In	2.379	0.976	Mg	Ba	Ge	Ti	Ga	Sc	Sc	Sc	2.812	1.222	Mg	Mg	Zn	Cd	Ge	Ti	Zr	Zr	3.294	0.780	
Be	Cd	Si	Sn	In	In	In	Sc	1.543	0.336	Cd	Cd	Sn	Zr	Ga	Y	Y	Y	2.379	0.752	Mg	Sr	Ti	Zr	Al	Al	Y	Y	2.812	0.787	Mg	Zn	Cd	Cd	Ge	Ti	Zr	Zr	3.294	0.653	
Ca	Sr	Si	Sn	Al	Ga	Ga	Ga	1.543	0.759	Zn	Cd	Cd	Ge	Ge	Y	Y	Y	2.379	0.865	Be	Zn	Ge	Ti	Ga	Ga	Ga	In	2.812	0.798	Be	Mg	Si	Ge	Al	Ga	Ga	Ga	3.294	0.835	
Mg	Sr	Sn	Zr	Al	In	In	In	1.543	0.747	Sr	Zn	Cd	Cd	Ti	Ti	Zr	Hf	2.379	1.002	Be	Ca	Zr	Zr	In	Sc	Sc	Y	2.812	1.244	Be	Ca	Ge	Ti	Al	Al	Al	Ga	3.294	0.847	
Ba	Ba	Si	Sn	Ga	In	Y	Y	1.543	0.332	Ca	Zn	Zr	Hf	Ga	In	In	In	2.379	1.239	Be	Ca	Zn	Zn	Sn	Sn	Zr	Hf	2.812	0.904	Mg	Ca	Zr	Zr	Al	Al	Ga	Sc	3.294	0.704	
Cd	Cd	Sn	Hf	Ga	Ga	Ga	In	Y	1.543	0.679	Ba	Ba	Ge	Zr	In	Y	Y	2.379	1.172	Be	Cd	Sn	Zr	Al	Al	Sc	Sc	2.812	1.122	Mg	Ba	Ba	Zn	Ti	Zr	Zr	Hf	3.294	0.641	
Mg	Ca	Ge	Ge	Ga	Ga	Ga	In	Y	1.543	0.653	Sr	Sr	Ti	Hf	Ga	In	Y	Y	2.379	1.031	Be	Cd	Hf	Hf	In	Sc	Sc	Y	2.812	1.390	Be	Be	Ca	Ba	Si	Si	Ge	Zr	3.295	0.559
Sr	Zn	Ge	Ti	Ga	In	In	In	1.543	0.288	Be	Sr	Si	Hf	Al	Al	In	In	2.379	1.146	Be	Be	Ge	Zr	Zr	In	Sc	Y	2.812	0.812	Be	Cd	Zr	Zr	Al	Ga	Ga	Zr	3.295	0.610	
Sr	Zn	Sn	Sn	In	Sc	Y	Y	1.543	0.675	Sr	Sr	Si	Hf	Al	Al	Ga	In	2.379	1.147	Be	Mg	Ba	Cd	Cd	Ge	Hf	Hf	Hf	2.812	1.017	Mg	Mg	Si	Ge	Al	Ga	Sc	Sc	3.295	0.664
Ca	Ba	Sn	Zr	Al	In	In	In	1.543	0.648	Mg	Ca	Si	Ge	In	Y	Y	Y	2.379	1.039	Cd	Cd	Si	Zr	Al	Al	Al	Ga	Sc	2.812	1.432	Be	Be	Be	Ca	Ge	Sn	Zr	Hf	3.295	0.790
Mg	Zn	Sn	Al	Cd	Ga	Ga	In	1.543	0.278	Be	Ba	Sn	Ti	Al	Y	Y	Y	2.379	1.127	Be	Be	Mg	Cd	Sn	Sn	Zr	Hf	2.812	0.556	Ca	Sr	Ba	Zn	Ti	Ti	Y	Zr	3.295	0.728	
Ca	Ba	Zn	Cd	Ge	Sn	Sn	Sn	1.544	0.857	Ba	Ba	Si	Hf	Al	Al	Ga	Sc	2.380	1.141	Be	Ca	Sr	Ba	Si	Sn	Sn	Sn	2.812	0.600	Ca	Sr	Si	Zr	Sc	Sc	Y	Y	3.295	0.829	
Sr	Ba	Ge	Ge	Al	Al	In	Y	1.545	0.853	Cd	Cd	Si	Ti	In	In	Y	Y	2.380	0.652	Mg	Ba	Ti	Zr	In	Sc	Sc	Sc	2.812	0.787	Be	Cd	Ti	Zr	Ga	Ga	Ga	Sc	3.295	0.847	
Ba	Cd	Ge	Ge	Al	In	In	Sc	1.546	0.297	Sr	Sr	Cd	Cd	Cd	Sn	Ti	Ti	Hf	2.380	0.563	Mg	Sr	Ge	Hf	Sc	Sc	Sc	Y	2.813	0.933	Be	Mg	Sr	Zn	Si	Ge	Ge	Ge	3.295	0.764
Ba	Ba	Sn	Zr	Al	In	In</																																		

Be	Sr	Sn	Zr	In	In	In	Sc	1.566	0.220	Be	Ca	Si	Zr	Al	In	In	In	2.386	0.784	Ca	Ba	Ti	Hf	In	Sc	Sc	Sc	2.817	0.934	Ca	Sr	Sr	Zn	Si	Si	Ge	Zr	3.302	0.622	
Sr	Cd	Sn	Ti	Al	Al	In	In	1.566	0.311	Mg	Cd	Ge	Hf	Ga	Ga	Y	Y	2.386	0.903	Be	Be	Ca	Zn	Si	Sn	Sn	Ti	2.817	0.667	Ca	Sr	Sr	Ba	Ge	Sn	Hf	Hf	3.302	0.711	
Ca	Ba	Ge	Ge	Ga	In	Y	Y	1.567	0.467	Ca	Ba	Zn	Zn	Si	Sn	Hf	Hf	2.386	0.882	Be	Ba	Zn	Ge	Zr	Si	Sn	Y	Y	2.818	0.828	Be	Ca	Sr	Ti	Al	Al	Ga	In	3.303	0.754
Ca	Ba	Sn	Ti	Al	In	In	In	1.567	0.460	Mg	Cd	Si	Sn	Al	Al	Y	Y	2.386	0.785	Be	Mg	Si	Hf	Al	In	In	In	2.818	1.013	Mg	Mg	Ti	In	Sc	Sc	Y	3.303	0.873		
Ca	Zn	Sn	Zr	Ga	In	In	In	1.567	0.350	Ba	Cd	Si	Ti	Ga	Ga	Sc	Sc	2.386	0.882	Ca	Ba	Cd	Cl	Ti	Zr	Zr	Hf	2.818	0.622	Ca	Zn	Si	Ti	Al	Al	Sc	Sc	3.303	0.825	
Ba	Zn	Ge	Sn	Al	Al	Y	Y	1.567	0.300	Ba	Ge	Ti	Ga	Ga	Sc	Sc	2.386	0.879	Be	Ca	Ca	Cd	Ge	Ge	Sn	Zr	2.818	0.690	Mg	Mg	Zn	Cd	Si	Ge	Ti	Ti	3.303	0.911		
Be	Sr	Ba	Cd	Si	Sn	Sn	Sn	1.567	0.288	Mg	Zn	Cd	Cd	Si	Sn	Sn	Hf	2.386	0.539	Mg	Sr	Ti	Al	In	In	Sc	Sc	2.818	0.839	Mg	Mg	Mg	Zn	Si	Ge	Sn	Hf	3.303	0.921	
Sr	Sr	Si	Sn	Ga	In	In	Sc	1.567	0.108	Ca	Ca	Sn	Zr	In	Sc	Sc	Y	2.387	0.455	Be	Cd	Ti	Hf	Al	Al	Y	Y	2.818	1.143	Mg	Zn	Ge	Hf	Sc	Y	Y	Y	3.303	0.853	
Sr	Zn	Sn	Zr	Ga	Ga	Y	Y	1.567	0.421	Be	Ca	Cd	Cd	Si	Sn	Sn	Hf	2.387	0.490	Be	Be	Sr	Cd	Ti	Ti	Zr	Hf	2.818	1.067	Be	Ca	Sr	Zn	Ge	Ge	Ti	Ti	3.303	0.704	
Mg	Cd	Sn	Hf	Ga	In	In	In	1.567	0.312	Sr	Zn	Si	Ge	Al	Al	Al	In	2.387	0.544	Ca	Zn	Cd	Cd	Ge	Zr	Hf	Hf	2.818	1.035	Be	Cd	Ge	Ti	Ga	Sc	Sc	Sc	3.303	0.627	
Mg	Ca	Sn	Hf	In	In	In	Y	1.568	0.205	Ca	Sr	Sn	Ti	Al	Al	Sc	2.387	0.443	Be	Ba	Zn	Cd	Ge	Ge	Ge	Hf	2.818	1.211	Be	Be	Sr	Ba	Sn	Zr	Hf	Hf	3.303	0.753		
Ba	Zn	Si	Ge	Ga	Ga	Ga	In	1.568	0.354	Be	Ba	Ti	Hf	Ga	Y	Y	Y	2.387	0.486	Ca	Ca	Si	Hf	Al	Ga	Sc	Sc	2.818	1.046	Mg	Mg	Zr	Hf	In	Sc	Sc	Y	3.303	0.740	
Mg	Cd	Ge	Sn	Ga	Ga	Ga	Y	1.568	0.300	Mg	Ca	Si	Ti	In	In	In	Sc	2.387	0.525	Sr	Ba	Zr	Hf	Al	Al	Al	Ga	2.818	1.063	Be	Be	Mg	Ba	Si	Ge	Ge	Hf	3.303	0.683	
Sr	Ba	Si	Ge	Ga	Ga	Ga	In	1.568	0.186	Mg	Ca	Ba	Cd	Sn	Sn	Sn	Ti	2.387	0.512	Mg	Ca	Ba	Cd	Cn	Sr	Zr	Zr	2.818	0.734	Mg	Zn	Zn	Cd	Ge	Ti	Zr	Zr	3.303	0.915	
Sr	Ba	Sn	Zr	Ga	In	In	In	1.569	0.357	Ca	Ba	Ti	Hf	In	In	Sc	Sc	2.387	0.517	Ca	Sr	Sr	Cd	Si	Si	Ti	Zr	2.818	0.780	Mg	Ba	Si	Ti	Al	Sc	Sc	Sc	3.304	1.040	
Mg	Zn	Sn	Sn	Ga	Ga	In	Sc	1.569	0.277	Mg	Mg	Si	Sn	Al	Ga	Ga	In	2.387	0.702	Sr	Sr	Si	Ti	In	Sc	Sc	Y	2.818	0.958	Mg	Zn	Zr	Zr	Al	In	Sc	Sc	3.304	0.898	
Sr	Cd	Sr	Zr	In	In	Sc	Y	1.569	0.165	Be	Be	Zn	Cd	Si	Sn	Sn	Zr	2.387	0.611	Mg	Mg	Ba	Zn	Si	Sn	Sn	Zr	2.818	0.630	Mg	Ca	Ba	Zn	Si	Si	Hf	Hf	3.304	0.805	
Ba	Cd	Si	Zr	Ga	In	In	In	1.569	0.358	Be	Ba	Ge	Ti	Ga	Y	Y	Y	2.387	0.646	Mg	Mg	Ti	Zr	Ga	In	Y	Y	2.818	0.705	Be	Mg	Zr	Zr	Ga	Sc	Sc	Y	3.304	0.755	
Ca	Sr	Sn	Zr	Al	In	In	In	1.570	0.274	Sr	Cd	Cd	Cd	Sn	Ti	Zr	Hf	2.387	0.748	Be	Ca	Hf	Hf	Ga	In	Sc	Sc	2.818	0.998	Be	Mg	Ba	Ba	Ge	Ge	Sn	Ga	Y	3.304	0.742
Be	Ba	Sn	Zr	Ga	Ga	In	In	1.570	0.163	Cd	Cd	Ti	Hf	Al	Al	In	Y	2.387	0.540	Be	Be	Ge	Hf	Ga	Ga	In	Y	2.819	1.161	Be	Mg	Si	Hf	Ga	Ge	Ga	Hf	3.304	0.656	
Be	Ca	Sn	Sn	Al	Al	In	Sc	1.570	0.631	Ca	Sr	Si	Zr	Ga	Ga	Ga	In	2.387	0.511	Mg	Mg	Sr	Cd	Si	Sn	Hf	Hf	2.819	1.060	Be	Mg	Si	Ti	In	In	Sc	Sc	3.304	0.912	
Ca	Zn	Ge	Ge	Al	In	In	Sc	1.570	0.646	Be	Be	Ba	Zn	Ge	Sn	Sn	Hf	2.387	0.876	Mg	Sr	Sr	Zn	Sn	Sn	Zr	Hf	2.819	1.099	Mg	Ca	Ba	Zn	Ge	Ge	Ge	Hf	3.304	0.785	
Be	Ba	Ge	Ge	Al	Al	Ga	In	1.570	0.284	Be	Sr	Zr	Zr	Ga	In	In	Y	2.388	0.818	Sr	Ba	Ti	Zr	Al	Al	Al	Sc	2.819	0.721	Be	Sr	Zn	Zn	Si	Ti	Zr	Zr	3.304	0.703	
Mg	Ba	Sn	Zr	In	In	Y	Y	1.570	0.656	Mg	Ca	Cd	Cd	Si	Sn	Hf	Hf	2.388	0.744	Mg	Ba	Ge	Hf	Sc	Sc	Y	Y	2.819	0.797	Mg	Ca	Sr	Cd	Si	Si	Si	Zr	3.304	0.780	
Cd	Cd	Si	Ge	Ga	Ga	In	Y	1.571	0.628	Ba	Zn	Sn	Hf	Al	Y	Y	Y	2.388	0.827	Be	Zn	Ti	Zr	Ga	Ga	Y	Y	2.819	0.974	Zn	Zn	Ge	Ti	Al	Sc	Sc	Y	3.304	0.890	
Ba	Ba	Si	Ge	Ga	Ga	Ga	Y	1.571	0.254	Zn	Zn	Sn	Hf	Al	In	Sc	Sc	2.388	0.697	Be	Ba	Ti	Ti	Al	Sc	Y	Y	2.819	0.658	Mg	Sr	Sr	Ba	Sn	Zn	Hf	Hf	3.305	0.776	
Sr	Cd	Si	Zr	In	In	In	Y	1.571	0.658	Be	Ca	Sn	Zr	Ga	Y	Y	Y	2.388	0.706	Be	Be	Ba	Ba	Si	Ge	Sn	Zr	2.819	0.735	Ca	Ba	Zn	Zn	Ti	Zr	Hf	Hf	3.305	0.951	
Zn	Cd	Ge	Zr	Al	In	In	In	1.571	0.625	Mg	Ba	Hf	Hf	Al	In	Y	Y	2.388	0.815	Ba	Zn	Ti	Ti	Al	Al	Sc	Y	2.819	1.013	Mg	Ca	Zn	Zn	Si	Si	Sn	Ti	3.305	0.948	
Be	Ca	Ge	Ge	Al	In	In	Y	1.572	0.250	Ca	Sr	Ge	Ti	Ga	Ga	Y	Y	2.388	0.669	Mg	Zn	Zr	Hf	In	In	In	Sc	2.819	0.732	Mg	Cd	Si	Ge	Al	Sc	Sc	Sc	3.305	0.879	
Mg	Sr	Sn	Ti	In	In	In	Sc	1.572	0.683	Ca	Ba	Cd	Cd	Sn	Ti	Hf	Hf	2.388	0.697	Ca	Zn	Sr	Cd	In	Ti	Zr	Zr	2.819	0.962	Be	Cd	Ti	Hf	Al	Al	Sc	Sc	3.305	0.734	
Be	Ca	Sn	Sn	Al	Ga	Ga	Sc	1.572	0.590	Mg	Ba	Zn	Sn	HF	Ga	Sc	Y	2.389	0.867	Ca	Sr	Ge	Zr	Sc	Sc	Y	Y	2.819	1.105	Be	Be	Mg	Zn	Ge	Zr	Zr	Hf	3.305	0.653	
Cd	Cd	Ge	Ge	Ga	In	Sc	Y	1.572	0.160	Ba	Zn	Sn	HF	Ga	Sc	Sc	Y	2.389	0.750	Mg	Ca	Ba	Cd	Ge	Zr	Zr	Zr	2.819	0.650	Be	Cd	Ti	Hf	Hf	Hf	Hf	Hf	3.305	0.742	
Sr	Ba	Sn	Ti	Ga	In	In	In	1.572	0.691	Be	Ca	Si	Si	Ga	In	Y	Y	2.389	0.694	Mg	Mg	Ba	Cd	Cd	Ge	Sn	Zr	2.819	0.896	Ca	Sr	Ba	Zn	Ge	Ge	Ge	Ti	3.305	0.773	
Be	Cd	Ge	Ge	Al	Ga	In	In	1.572	0.586	Ca	Cd	Ge	Sn	Sc	Sc	Sc	Y	2.389	0.988	Ca	Ba	Si	Ti	Al	Al	Al	In	2.819	1.163	Mg	Mg	Si	Si	Al	Ga	In	Sc	3.305	0.882	
Zn	Cd	Sn	Hf	Al	Al	In	In	1.572	0.150	Be	Cd	Ge	Ge	Al	Al	In	Sc	2.389	1.035	Be	Ba	Hf	Hf	Al	Ga	Ga	Sc	2.820	0.528	Be	Be	Mg	Ba	Ge	Zr	Hf	Hf	3.305	0.837	
Ca	Sr	Sn	Ti	In	In	In	Sc	1.573	0.928	Be	Ca	Sn	HF	Ga	Ga	Sc	Sc	2.389	0.963	Be	Ca	Ge	Zr	In	Sc	Sc	Sc	2.820	0.608	Mg	Cd	Si	Si	Ga	Sc	Sc	Y	3.305	0.927	
Sr	Zn	Ge	Ti	Al	In	In	In	1.573	0.912	Ba	Ba	Hf	Hf	Ga	Ga	In	Sc	2.389	0.920	Mg	Ca	Ti	Zr	Ga	Ga	Y	Y	2.820	0.767	Mg	Mg	Sr	Cd	Si	Si	Ge	Ti	3.306	0.921	
Mg	Cd	Si	Sn	Ga	Ga	Ga	In	1.573	0.222	Ca	Zn	Si	Ge	Ga	Ga	Sc	Sc	2.389	0.896	Be	Be	Ba	Cd	Cn	Ti	Ti	Zr	2.820	1.107	Mg	Ca	Ti	Zr	Al	Al	Al	Y	3.306	0.865	
Ba	Ba	Ge	Ge	Al	In	Sc	Y	1.573	0.656	Zn	Zn	Cd	Cd	Si	Ge	Sn	Hf	2.389	0.939	Ba	Ba	Ti	Hf	Al	Al	Sc	Y	2.820	1.052	Ca	Zn	Ti	Hf	Sc	Sc	Y	Y	3.306	0.728	
Ca	Zn	Ge	Zr	In	In	In	Y	1.574	0.665	Sr	Ba	Si	Zr	Al	Ga	Ga	Ga	2.389	0.906	Sr	Ba	Ba	Zn	Zn	Si	Ti	Zr	2.820	1.066	Be	Mg	Ge	Zr	Ga	Ga	Sc	Sc	3.306	0.653	
Mg	Ba	Ge	Ge	Al	Al	In	Y	1.574	0.413	Be	Sr	Zr	Hf	Ga	Ga	In	In	2.389	0.864	Sr	Ba	Ba	Zn	Sn	Si	Sn	Sn	Ti	2.820	1.161	Be	Mg	Sn	Zr	Al	Al	In	In	3.306	0.774
Ca	Cd	Ge	Sn	Ga	Ga	Sc	Sc	1.574	0.672	Ba	Ba	Zn	Cd	Cn	Ti	Ti	Zr	2.390	0.931	Be	Be	Zr	Hf	Al	In	Y	Y	2.820	1.030	Be	Ca	Si	Zr	Sc	Sc	Y	Y	3.306	0.764	
Ba	Cd	Si	Sn	Ga	Ga	Sc	Sc	1.574	0.644	Ba	Ba	Zr	Hf	Ga	In	In	Sc	2.390	1.079	Mg	Ba	Ba	Zn	Ge	Sn	Sn	Ti	2.820	1.091	Be	Cd	Si	Si	Al	Al	Ga	Y	3.306	0.708	
Ba	Zn	Sn	Zr	Ga	Ga	Ga	In	1.574	0.379	Ca	Sr	Sn	Zr	In	Y	Y	Y	2.390	1.297	Be	Cd	Ti	Ti	Al	Ga	Y	Y	2.820	0.846	Mg	Zn	Cd	Cd	Ge	Zr	Zr	Hf	3.306	0.932	
Ca	Zn	Ge	Sn	Al	Ga	Ga	Ga	1.575	0.672	Mg	Cd	Sn	Zr	Al	Al	Y	Y	2.390	1.259	Mg	Cd	Sn	Hf	Sc	Sc	Y	Y	2.820	0.896	Ca	Sr	Ba	Ge	Sn	Hf	Hf	Hf	3.307	0.840	
Ba	Cd	Ge	Zr	Ga	Ga	Ga	Y	1.575	0.																															

Be	Cd	Ge	Ge	Ga	In	In	Y	1.592	0.520	Ca	Ca	Si	Si	Ga	In	Sc	Y	2.396	0.577	Be	Be	Ba	Cd	Si	Ge	Hf	Hf	2.825	0.894	Be	Be	Mg	Sr	Sn	Zr	Zr	Hf	3.316	0.596			
Cd	Cd	Sn	Zr	Al	Ga	Ga	In	1.593	0.155	Ba	Cd	Ge	Ti	Al	Al	Al	Ga	2.396	0.709	Be	Sr	Ge	Cd	Si	Ge	Ge	Ti	2.825	0.888	Be	Zn	Ge	Zr	Al	Al	Sc	Sc	3.316	0.638			
Mg	Cd	Ge	Ge	Ga	Ga	In	Sc	1.593	0.115	Ba	Ba	Si	Zr	Al	Al	Ga	In	2.396	0.803	Be	Zn	Ge	Zr	Al	Ga	Sc	Sc	2.825	0.899	Ca	Cd	Zr	Hf	Al	Sc	Sc	3.317	0.529				
Be	Zn	Sn	Sn	Ga	In	In	Sc	1.593	0.014	Ba	Cd	Sn	Ti	In	Sc	Sc	Sc	2.397	0.547	Ca	Ca	Sr	Cd	Ge	Ge	Ti	Zr	2.826	0.963	Zn	Zn	Ti	Zr	Al	Sc	Sc	Y	3.317	0.493			
Sr	Zn	Ge	Ge	Al	Al	In	Y	1.594	0.364	Ca	Cd	Si	Zr	Al	Al	In	In	2.397	0.700	Be	Ca	Si	Cd	Ge	Al	Ti	In	2.826	0.869	Mg	Cd	Si	Hf	Al	Al	Y	Y	3.317	0.621			
Sr	Zn	Ge	Zr	Ga	Ga	In	In	1.594	0.266	Mg	Sr	Sn	Hf	Al	Al	Sc	Sc	2.397	0.841	Be	Be	Zn	Cd	Si	Si	Sn	Zr	2.826	0.886	Mg	Cd	Zr	Ti	Ga	Sc	Sc	Sc	3.317	0.529			
Ca	Cd	Sn	Sn	Al	Al	Sc	Y	1.595	0.156	Mg	Sr	Si	Si	Al	Ga	Ga	Y	2.397	1.065	Sr	Ba	Si	Hf	Al	Al	Sc	Sc	2.826	0.806	Mg	Cd	Zr	Al	Al	Ga	Sc	Sc	3.317	0.602			
Mg	Ba	Ge	Hf	In	In	In	Sc	1.595	0.278	Ba	Cd	Hf	Hf	Al	Al	Ga	In	2.397	1.036	Mg	Zn	Ti	Hf	Al	Al	In	In	2.826	0.764	Be	Be	Mg	Cd	Si	Si	Ge	Zr	3.317	1.269			
Sr	Cd	Si	Hf	In	In	In	In	1.595	0.226	Ba	Zn	Ge	Ti	Al	Al	Al	In	2.397	0.837	Be	Zn	Cd	Cd	Sn	Sn	Zr	Hf	2.826	0.828	Mg	Mg	Ca	Cd	Ti	Zr	Zr	Hf	3.317	1.125			
Be	Sr	Si	Sn	Ga	Ga	Y	Y	1.595	0.116	Ba	Ba	Ge	Ti	Al	Ga	Y	Y	2.397	0.927	Ca	Sr	Ba	Cd	Ti	Ti	Ti	Hf	2.826	0.775	Be	Zn	Ge	Hf	Sc	Sc	Sc	Y	3.318	0.518			
Ca	Ca	Si	Sn	Ga	Ga	In	Sc	1.596	0.259	Be	Sr	Hf	Hf	In	Sc	Y	Y	2.397	0.994	Zn	Zn	Zr	Zr	Al	In	Sc	Y	2.826	0.716	Mg	Sr	Ba	Zn	Ge	Ti	Ti	Ti	3.318	0.476			
Ca	Sr	Ge	Ti	In	In	In	Y	1.596	0.218	Ca	Cd	Si	Zr	Al	Ga	Ga	Ga	2.397	0.838	Be	Be	Ca	Cd	Si	Sn	Zr	Zr	2.826	0.837	Be	Ca	Sr	Ba	Sn	Sn	Ti	Ti	3.318	0.763			
Sr	Ba	Ge	Hf	In	In	In	Sc	1.597	0.108	Sr	Cd	Zr	Zr	Al	Al	In	Y	2.397	0.900	Ba	Sr	Ba	Si	Si	Sn	Ti	Hf	2.826	0.889	Mg	Mg	Zn	Cd	Si	Ti	Ti	Hf	3.318	0.600			
Cd	Cd	Ge	Ti	Al	Ga	Ga	In	1.597	0.520	Sr	Zn	Zn	Cd	Ge	Ge	Ti	Zr	2.397	0.985	Sr	Sr	Ba	Zn	Ge	Sn	Zr	2.827	0.786	Be	Mg	Ge	Hf	In	Sc	Sc	Sc	3.318	0.552				
Mg	Cd	Si	Ge	Ga	Ga	In	In	1.597	0.449	Cd	Cd	Sn	Zr	In	Sc	Sc	Y	2.397	0.545	Ca	Sr	Zr	Hf	Al	Al	Ga	Ga	2.827	0.784	Ca	Sr	Si	Ti	Sc	Sc	Sc	Y	3.318	0.752			
Mg	Ca	Sn	Sn	Al	Al	Ga	Sc	1.597	0.184	Sr	Sr	Ge	Ti	Al	Al	Ga	Y	2.397	0.440	Be	Mg	Ba	Cd	Cd	Sn	Ti	Ti	2.827	0.769	Zn	Cd	Ge	Ti	Al	Sc	Sc	Sc	3.318	0.593			
Be	Zn	Sn	Sn	In	In	Sc	Y	1.597	0.444	Mg	Cd	Cd	Zr	Zr	Al	In	Y	2.397	0.464	Be	Ba	Ba	Cd	Si	Si	Ge	Hf	2.827	0.674	Mg	Sr	Si	Ti	Al	Al	Sc	Sc	3.318	0.591			
Be	Ba	Si	Ge	In	In	Sc	Sc	1.598	0.413	Mg	Sr	Sr	Cd	Si	Sn	Hf	Hf	2.398	0.550	Mg	Zn	Zn	Cd	Cd	Ge	Sn	Hf	Hf	2.827	0.707	Be	Sr	Sr	Zn	Ti	Zr	Hf	Hf	3.318	0.998		
Ba	Ba	Ge	Hf	Ga	In	In	Y	1.598	0.134	Sr	Zn	Ti	Ti	Al	In	In	Sc	2.398	0.422	Mg	Sr	Si	Hf	Al	Al	Al	In	2.827	0.777	Be	Mg	Cd	Cd	Ti	Ti	Zr	Hf	3.318	0.722			
Sr	Sr	Sn	Hf	Al	Ga	Ga	In	1.598	0.426	Mg	Zn	Si	Sn	Ga	Ga	Ga	Sc	2.398	0.452	Be	Ca	Si	Ge	Al	Al	Y	Y	2.827	0.637	Be	Be	Mg	Ba	Sn	Sn	Ti	Zr	3.318	0.681			
Ba	Ba	Ge	Sn	In	In	Sc	Y	1.599	0.405	Be	Zn	Si	Hf	In	In	Y	Y	2.398	0.481	Ca	Cd	Zr	Zr	Al	Al	Ga	Y	2.827	0.716	Be	Mg	Ba	Zn	Si	Si	Ge	Ge	3.319	1.001			
Mg	Sr	Ge	Ti	In	In	In	Y	1.599	0.125	Be	Zn	Ge	Sn	Ga	Ga	Ga	Sc	2.398	0.463	Ca	Zn	Zr	Zr	Ga	Sc	Sc	Sc	2.827	0.748	Mg	Mg	Si	Hf	In	Sc	Sc	Y	3.319	0.712			
Ba	Ba	Sn	Hf	Al	Ga	Ga	In	1.600	0.315	Ba	Cd	Si	Hf	Al	Al	Al	Y	2.398	0.464	Ca	Ca	Sr	Cd	Ge	Zr	Hf	Hf	2.827	0.810	Be	Ca	Ti	Hf	Al	Al	Al	Y	3.319	0.378			
Be	Mg	Ge	Sn	Ga	Ga	In	In	1.600	0.293	Ba	Zn	Sn	Ti	Al	Al	Al	Sc	2.398	0.727	Ca	Ca	Si	Hf	In	Sc	Sc	Y	2.827	0.852	Mg	Mg	Ca	Sr	Si	Sn	Hf	Sc	3.319	0.333			
Sr	Zn	Ge	Ge	Ga	Ga	In	Sc	1.600	0.149	Sr	Ba	Ge	Zr	Al	Al	Al	Ga	2.398	0.589	Ca	Zn	Zr	Zr	Ga	Ga	Sc	Y	2.827	0.739	Be	Zn	Zr	Hf	Ga	Ga	Sc	Sc	3.319	0.331			
Ca	Sr	Sn	Ti	Al	In	In	Sc	1.600	0.302	Sr	Sr	Sn	Hf	Ga	Sc	Y	Y	2.398	0.612	Mg	Sr	Si	Hf	Ga	Y	Y	Y	2.827	0.770	Mg	Zn	Si	Ti	Al	Al	Y	Y	3.320	0.691			
Mg	Sr	Si	Ge	Ga	Ga	Ga	In	1.600	0.282	Mg	Ba	Ti	Zr	In	In	Sc	Sc	2.398	0.877	Be	Mg	Ge	Sn	Al	Al	Ga	Ga	2.827	0.880	Ca	Sr	Ba	Zn	Si	Ti	Ti	Ti	3.320	1.087			
Be	Sr	Sn	Ti	In	In	Y	Y	1.600	0.132	Mg	Cd	Zr	Hf	In	In	Y	Y	2.398	0.531	Mg	Ba	Zr	Zr	Zr	Al	Ga	Ga	Sc	2.827	0.637	Mg	Sr	Ba	Zn	Si	Si	Ge	Ti	3.320	0.959		
Ba	Cd	Si	Ge	Ga	Ga	Y	Y	1.601	0.394	Sr	Ba	Ti	Zr	In	In	Sc	Sc	2.398	0.549	Be	Zn	Zr	Zr	Zr	In	In	Sc	Y	2.828	0.672	Ca	Cd	Ti	Ti	Al	Sc	Sc	Y	3.320	0.770		
Be	Ba	Sn	Hf	In	In	Sc	Sc	1.601	0.392	Mg	Sr	Si	Ge	In	In	Sc	Sc	2.398	0.709	Be	Mg	Zn	Zn	Si	Ge	Sn	Sc	2.828	0.772	Mg	Mg	Zr	Hf	Ga	In	Sc	Sc	3.320	1.082			
Ca	Zn	Si	Ge	In	In	In	Sc	1.601	0.151	Be	Sr	Cd	Cd	Si	Si	Si	Sn	2.399	0.515	Mg	Sr	Cd	Cd	Si	Si	Ge	Hf	2.828	0.940	Be	Mg	Si	Sn	Al	Al	Y	Y	3.320	0.946			
Mg	Cd	Ge	Sn	Ga	Ga	Ga	Y	1.607	0.648	Sr	Sr	Ba	Zn	Si	Ge	Sn	Sn	2.399	0.574	Ca	Zn	Cd	Cd	Si	Si	Ti	Zr	2.828	0.945	Mg	Mg	Ca	Cd	Sn	Ti	Ti	Hf	3.321	0.492			
Cd	Cd	Cn	Zr	Zr	Ga	Ga	In	Y	1.601	0.576	Mg	Ca	Cd	Ge	Ge	Sn	Hf	2.399	0.720	Ca	Cn	Zr	Cd	Si	Si	Si	Ti	2.828	0.952	Mg	Cd	Zr	Zr	Al	Sc	Sc	Y	3.321	0.451			
Mg	Sr	Ge	Sn	Al	Al	Al	In	1.601	0.419	Sr	Sr	Ge	Zr	Al	Al	Sc	Y	2.399	0.368	Mg	Mg	Sr	Cd	Si	Si	Ge	Sn	2.828	1.011	Mg	Sr	Ba	Ba	Si	Si	Ge	Sn	3.321	0.563			
Ba	Zn	Sn	Ti	Ga	Ga	Y	Y	1.602	0.563	Ba	Zn	Ba	Zr	Hf	Al	In	In	2.399	0.525	Mg	Mg	Cd	Cd	Sn	Sn	Ti	Hf	2.828	0.930	Be	Be	Ge	Zr	Al	In	Sc	Sc	3.321	0.563			
Ca	Ca	Si	Ge	Al	In	In	Y	1.602	0.543	Sr	Sr	Ba	Cd	Si	Si	Ge	Sn	2.399	0.724	Mg	Mg	Zn	Cd	Cd	Si	Si	Sn	Zr	2.828	0.920	Ca	Ba	Zn	Zn	Ti	Zr	Zr	Hf	3.321	0.541		
Ba	Ba	Ge	Sn	Al	Ga	Ga	Y	1.602	0.372	Ba	Zn	Zn	Cd	Cd	Si	Ti	Zr	Zr	2.399	0.346	Be	Ca	Ge	Hf	Al	Al	Al	In	2.828	0.891	Be	Cd	Sn	Ti	Al	Al	Sc	Sc	3.322	0.840		
Ca	Cd	Si	Ge	Ga	Ga	Ga	Y	1.603	0.543	Be	Ba	Si	Ti	Ga	Ga	Ga	Y	2.399	0.517	Mg	Sr	Sn	Ti	Al	Al	Sc	Sc	Sc	2.828	0.830	Be	Ba	Ca	Zn	Si	Ge	Hf	Hf	3.322	1.422		
Ca	Cd	Sn	Ti	In	In	Y	Y	1.603	0.535	Be	Ca	Ti	Hf	In	In	In	Y	2.399	0.946	Ca	Ba	Ba	Ba	Zn	Si	Ge	Hf	Hf	2.828	0.856	Ca	Ba	Ba	Ba	Sn	Ti	Zr	Hf	3.322	1.281		
Sr	Sr	Ge	Sn	Al	Ga	Sc	Sc	1.603	0.362	Cd	Cd	Ti	Hf	Al	Al	Ga	In	2.399	0.741	Be	Ba	Ba	Zn	Zn	Ge	Ge	Sn	Ti	2.828	0.871	Mg	Ba	Cd	Zn	Zn	Si	Ti	Zr	3.322	1.134		
Be	Ba	Ge	Hf	In	In	Y	Y	1.603	0.417	Ba	Zn	Ti	Zr	Zr	Ga	Ga	Ga	In	2.399	0.739	Ca	Ba	Hf	Hf	Al	Al	Sc	Sc	Y	2.828	0.782	Mg	Mg	Cn	Ti	Ti	Al	Sc	Y	Y	3.322	0.696
Cd	Cd	Si	Sn	Al	Al	In	Y	1.603	0.407	Mg	Ba	Ti	Ti	Ga	Ga	In	In	2.399	0.797	Be	Cd	Ti	Zr	Al	In	In	Sc	Sc	2.828	0.841	Ca	Ca	Sr	Zn	Si	Zr	Sc	Sc	Y	3.322	0.948	
Sr	Cd	Si	Si	Ga	In	In	Y	1.604	0.382	Ba	Ba	Ti	Ti	Al	Ga	In	Sc	Y	2.399	0.769	Mg	Mg	Sn	Zr	Al	Al	Ga	In	2.828	0.941	Zn	Zn	Si	Hf	Al	Sc	Hf	Y	3.322	0.808		
Be	Sr	Ge	Zr	In	In	In	Y	1.604	0.402	Be	Sr	Cn	Cd	Sn	Sn	Hf	Hf	2.400	0.803	Mg	Mg	Sn	Hf	Al	Ga	Ga	Sc	Sc	2.828	0.840	Be	Zn	Cd	Cd	Si	Ge	Ge	Ti	3.322	0.764		
Be	Zn	Sn	Sn	Al	In	Y	Y	1.604	0.395	Be	Ca	Ge	Zr	Ga	Y	Y	Y	2.400	0.804	Mg	Ca	Si	Hf	Ga	Ga	Ga	Sc	2.829	0.816	Ca	Cn	Zn	Ti	Ti	Zr	Hf	3.					

Mg	Ca	Ge	Ge	Al	Ga	In	In	1.6225	0.783	Sr	Zn	Ge	Sn	Sc	Y	Y	Y	2.406	0.303	Mg	Cd	Si	Si	Al	Al	In	Y	2.833	0.386	Be	Cd	Ti	Ti	Al	Sc	Sc	Y	3.333	1.046	
Mg	Ca	Si	Ge	In	In	In	Sc	1.6225	0.788	Ba	Zn	Cd	Cd	Ti	Zr	Hf	Hf	2.406	0.544	Mg	Mg	Cd	Cd	Si	Sn	Ti	Zr	2.833	0.327	Be	Be	Mg	Ba	Sn	Ti	Hf	Hf	3.333	0.924	
Be	Ba	Ge	Ge	Ga	Ga	Sc	Y	1.6225	0.680	Sr	Ba	Ge	Cd	Ge	Sn	Sn	Hf	2.406	0.345	Mg	Ge	Cd	Ge	Sn	Sn	Ti	Zr	2.833	0.389	Be	Ba	Zn	Zn	Si	Ge	Sn	Ti	3.333	0.848	
Sr	Zn	Ge	Ti	In	In	In	Sc	1.6226	0.758	Sr	Ba	Zn	Zr	Zr	Al	In	In	Sc	0.401	2.406	0.401	Ca	Cr	Zr	Hf	Ga	Ga	Sc	Sc	2.834	0.545	Be	Ba	Zn	Zn	Si	Ge	Ti	3.333	0.665
Ca	Ba	Sn	Hf	In	In	Y	Y	1.626	0.778	Ca	Ba	Ge	Hf	Al	Al	Ga	Ga	2.406	0.509	Ba	Cd	Ge	Ti	Al	Sc	Sc	Sc	2.834	0.430	Be	Ba	Zn	Zn	Si	Y	Y	3.333	0.754		
Ba	Cd	Si	Si	Al	In	In	Y	1.626	0.670	Be	Ba	Ge	Ti	Al	Al	Ga	Ga	2.407	0.460	Ca	Sr	Cd	Cd	Ti	Zr	Hf	Hf	2.834	0.868	Be	Be	Sr	Ba	Sn	Ti	Hf	3.333	0.684		
Ca	Sr	Ge	Ge	Al	Al	In	Y	1.626	1.036	Sr	Sr	Hf	Hf	Al	In	Sc	Y	2.407	0.464	Ca	Sr	Ba	Cd	Ti	Ti	Ti	Zr	2.834	0.826	Be	Be	Mg	Zn	Si	Zr	Hf	3.333	0.751		
Ba	Zn	Si	Si	Ge	Al	In	Y	1.626	1.005	Mg	Cd	Si	Ti	In	In	In	Sc	2.407	0.478	Be	Be	Mg	Ba	Ge	Sn	Sn	Hf	2.834	0.703	Ca	Sr	Zn	Zn	Ti	Zr	Hf	3.333	0.771		
Ba	Ba	Si	Ge	Al	Ga	In	In	1.626	0.763	Ca	Sr	Ge	Zr	Al	Al	Al	In	2.407	0.318	Be	Zn	Zn	Cd	Ge	Ge	Sn	Zr	2.834	0.346	Ca	Sr	Sr	Zn	Ti	Zr	Hf	3.333	0.705		
Ca	Ba	Ge	Hf	In	In	In	Sc	1.627	0.930	Ba	Ba	Zr	Hf	Al	In	Y	Y	2.407	0.440	Be	Ca	Ca	Cd	Ge	Sn	Ti	Ti	2.834	0.496	Be	Cd	Si	Hf	Ga	Sc	Sc	3.333	0.723		
Ca	Ca	Sn	Sn	Ga	Sc	Y	Y	1.627	0.964	Mg	Mg	Ge	Sn	Ga	Sc	Y	Y	2.407	0.472	Sr	Ba	Ge	Zr	Al	Y	Y	Y	2.834	0.549	Be	Be	Si	Zr	Al	In	Y	3.333	0.914		
Ca	Ba	Sn	Hf	Ga	Ga	Ga	Y	1.627	0.708	Be	Sr	Si	Sn	Sc	Sc	Y	Y	2.407	0.291	Ca	Ba	Ge	Zr	Al	Sc	Sc	Sc	2.834	0.468	Be	Mg	Cd	Cd	Ge	Ti	Ti	Hf	3.333	0.782	
Ba	Cd	Ge	Hf	Al	Ga	Ga	Ga	1.627	0.906	Mg	Ca	Ti	Zr	In	In	In	Y	2.407	0.435	Be	Ca	Si	Zr	Ge	Y	Y	Y	2.834	0.646	Ca	Sr	Sr	Zn	Si	Ti	Ti	Hf	3.333	0.822	
Sr	Zn	Si	Sn	Al	Ga	Ga	Ga	1.628	0.954	Sr	Ba	Hf	Hf	Al	Ga	In	Y	2.407	0.570	Mg	Cd	Zr	Zr	Zr	Al	Ga	In	2.834	0.634	Ba	Be	Mg	Zn	Si	Ti	Hf	Hf	3.333	0.947	
Ca	Ge	Ge	Al	Al	Ga	In	In	1.628	0.697	Zn	Zn	Si	Ge	Al	Al	In	Y	2.407	0.800	Zn	Cd	Ge	Zr	Al	Sc	Y	Y	2.834	0.418	Mg	Cd	Ti	Hf	Sc	Sc	Y	Y	3.333	0.798	
Be	Ba	Ge	Zr	In	In	In	Sc	1.628	0.790	Sr	Cd	Ti	Hf	Al	Ga	Ga	Ga	2.407	0.716	Be	Mg	Ge	Ti	Ge	Ga	Y	Y	2.834	0.674	Be	Be	Cd	Cd	Si	Zr	Hf	3.334	0.663		
Ca	Ba	Ge	Ge	Ga	In	Sc	Sc	1.628	0.790	Ca	Ba	Si	Hf	Al	Al	In	Sc	2.407	0.518	Mg	Sr	Ba	Cd	Ge	Ti	Ti	Ti	2.834	0.845	Mg	Sr	Zn	Zn	Sn	Zr	Hf	Hf	3.334	0.625	
Sr	Zn	Sn	Zr	Al	Al	In	In	1.629	0.686	Mg	Mg	Mg	Zn	Cd	Si	Sn	Sn	Zr	2.408	0.664	Zn	Zn	Zr	Hf	Al	Al	Ga	In	2.834	0.512	Be	Mg	Ba	Zn	Ge	Ge	Ti	3.334	0.639	
Ba	Zn	Ge	Zr	Ga	Ga	Y	Y	1.629	0.771	Ca	Cr	Zn	Zn	Ge	Sn	Zr	Zr	2.408	0.692	Zn	Cd	Sn	Ti	Sc	Sc	Y	Y	2.834	0.816	Zn	Zn	Zr	Zr	Al	Al	Ga	Sc	3.334	0.710	
Ba	Ba	Sn	Hf	Al	Al	Ga	Y	1.629	0.776	Mg	Mg	Si	Sn	Ga	In	Sc	Sc	2.408	0.510	Mg	Sr	Zr	Zr	Al	Ga	Sc	Y	2.834	0.944	Be	Sr	Ba	Zn	Zr	Hf	Hf	Hf	3.334	0.897	
Ba	Zn	Zn	Cd	Si	Sn	Sn	Hf	1.629	0.667	Ba	Ba	Ba	Cd	Si	Ge	Sn	Zr	2.408	0.637	Mg	Sr	Zr	Hf	Al	Ga	Ga	Ga	2.834	0.361	Be	Mg	Mg	Cd	Si	Zr	Zr	Hf	3.334	0.817	
Ca	Zn	Sn	Ti	Ga	In	In	In	1.630	0.835	Be	Ca	Ge	Ti	In	In	Sc	Sc	2.408	0.687	Sr	Sr	Ba	Zn	Si	Sn	Sn	Ti	2.834	0.463	Ca	Sr	Ba	Zn	Zr	Zr	Hf	Hf	3.334	0.795	
Cd	Cd	Si	Ge	Al	In	In	Sc	1.630	0.836	Ca	Zn	Cd	Cd	Ge	Sn	Ti	Ti	2.408	0.408	Zn	Zn	Hf	Hf	Al	Ga	In	Sc	2.834	0.451	Mg	Mg	Mg	Sr	Si	Ge	Sn	Hf	3.334	0.920	
Mg	Cd	Si	Sn	Al	Al	In	In	1.630	0.661	Ca	Cd	Ti	Ti	Ga	Ga	In	Y	2.408	0.344	Be	Cd	Si	Sn	Al	Al	Sc	Sc	2.834	0.600	Be	Be	Si	Zr	Ga	Ga	Sc	Y	3.334	0.820	
Mg	Cd	Sn	Sn	Al	Ga	Ga	Sc	1.631	1.171	Mg	Sr	Zr	Zr	Ga	In	Y	Y	2.408	0.393	Mg	Cd	Si	Si	Al	Al	In	Y	2.834	0.545	Be	Be	Ge	Zr	Al	Al	Sc	Y	3.334	0.656	
Sr	Zn	Sn	Sn	Ga	Sc	Y	Y	1.632	1.137	Sr	Mg	Mg	Cd	Cd	Sn	Sn	Hf	2.408	0.405	Mg	Zn	Si	Hf	In	In	Sc	Sc	2.835	0.457	Mg	Ba	Zn	Zn	Ge	Zr	Zr	Hf	3.334	0.623	
Zn	Cd	Ge	Sn	Al	Al	Ga	Ga	1.632	1.000	Ba	Ba	Si	Ge	Al	Al	Sc	Y	2.408	0.327	Be	Sr	Ge	Zr	Al	Sc	Sc	Sc	2.835	0.776	Be	Ca	Ge	Ti	Al	Sc	Sc	Sc	3.334	0.650	
Be	Ba	Ge	Zr	Al	In	In	In	1.632	1.057	Be	Sr	Ti	Ti	Al	Ga	In	In	2.408	0.386	Be	Ba	Ba	Zn	Ge	Ge	Zr	Hf	2.835	0.705	Ca	Ca	Zn	Si	Hf	Sc	Y	Y	3.334	0.710	
Mg	Cd	Sn	Hf	In	In	In	Y	1.633	1.099	Ba	Zn	Ge	Zr	Al	Al	Al	Ga	2.408	0.425	Sr	Ba	Si	Ti	Al	Al	Al	Sc	2.835	0.519	Be	Mg	Zn	Zn	Ge	Ge	Sn	Ti	3.335	0.695	
Ca	Sr	Si	Ge	Ga	Ga	Ga	In	1.633	0.948	Be	Ca	Si	Sn	Al	Al	Y	Y	2.408	0.414	Mg	Sr	Sr	Cd	Si	Ge	Ge	Hf	2.835	0.400	Be	Be	Ge	Zr	Al	Ga	Ga	Y	3.335	0.860	
Mg	Sr	Zn	Zr	In	In	Y	Y	1.633	1.032	Ca	Zn	Hf	Hf	Al	In	In	Y	2.408	0.421	Ca	Sr	Ti	Hf	Al	Al	Al	In	2.835	0.511	Mg	Mg	Zr	Hf	Al	Sc	Y	Y	3.335	1.555	
Sr	Zn	Ge	Ti	In	In	Y	Y	1.633	1.089	Ca	Sr	Sr	Cd	Si	Sn	Sn	Hf	2.408	0.904	Ba	Cd	Ti	Zr	Al	Al	Al	Ga	2.835	0.453	Ca	Sr	Sr	Zn	Sn	Ti	Ti	Hf	3.335	1.420	
Zn	Cd	Sn	Zr	Al	Al	In	In	1.633	0.937	Ba	Ba	Ti	Zr	Zr	Ga	In	In	Y	2.408	0.675	Mg	Ba	Ti	Ti	Ga	Sc	Y	Y	2.835	0.482	Mg	Cd	Si	Si	Al	Al	Ga	Sc	3.335	1.256
Ba	Zn	Sn	Hf	Ga	Ga	Ga	Sc	1.634	0.902	Mg	Ca	Cd	Cd	Sn	Ti	Zr	Zr	2.408	0.711	Sr	Zn	Ti	Hf	Ga	Y	Y	Y	2.835	0.654	Mg	Mg	Sr	Sr	Si	Ge	Sn	Hf	3.335	0.843	
Ba	Ba	Si	Ti	In	In	In	Y	1.634	0.912	Ba	Ca	Ge	Zr	Al	In	Y	Y	2.408	0.945	Ca	Cd	Zr	Zr	Zr	In	Sc	Sc	2.835	0.556	Be	Be	Mg	Ba	Ti	Ti	Zr	Hf	3.336	1.092	
Ba	Ba	Si	Sn	Al	Al	Ga	Sc	1.634	0.922	Zn	Cd	Ge	Sn	Sc	Y	Y	Y	2.408	0.607	Zn	Zn	Zn	Cd	Si	Sn	Ti	Hf	2.835	0.816	Be	Ca	Ti	Zr	Sc	Sc	Sc	Y	3.336	0.934	
Cd	Cd	Sn	Hf	Al	In	Y	Y	1.634	0.882	Mg	Mg	Zn	Cd	Cd	Ge	Sn	Sn	Zr	2.409	0.648	Sr	Ba	Ba	Zn	Ge	Ge	Zr	Hf	2.835	0.789	Be	Zn	Zr	Hf	Ga	Ga	Sc	Sc	3.336	0.908
Zn	Cd	Si	Ge	In	In	Y	Y	1.634	0.898	Be	Be	Sr	Cd	Si	Si	Sn	Hf	2.409	0.808	Mg	Ca	Cd	Cd	Si	Ge	Ti	Ti	2.835	0.682	Mg	Mg	Zn	Sn	Ti	Sc	Y	Y	3.336	1.084	
Mg	Cd	Ge	Sn	Al	Ga	Ga	Ga	1.635	0.903	Mg	Sr	Sr	Cd	Ge	Sn	Zr	Zr	2.409	0.635	Ca	Cd	Zr	Hf	Ga	Ga	Ga	Sc	2.835	0.430	Mg	Ba	Ba	Zn	Zn	Si	Si	Ti	Zr	3.336	0.930
Sr	Ba	Sn	Ga	Sc	Y	Y	Y	1.635	0.940	Sr	Zn	Cd	Cd	Si	Si	Zr	Hf	2.409	0.689	Be	Ca	Sr	Cd	Si	Zr	Zr	Zr	2.836	0.559	Mg	Zn	Ti	Ti	Al	Ga	Ga	Y	3.336	0.938	
Mg	Cd	Ge	Ge	Ga	Ga	In	Y	1.635	0.942	Zn	Zn	Sn	Si	Ge	Al	Al	Ga	In	2.409	0.805	Ba	Cd	Si	Hf	Al	Y	Y	Y	2.836	0.580	Be	Be	Be	Ca	Sn	Zr	Hf	3.336	1.299	
Ba	Cd	Ge	Ti	Ga	Ga	Ga	In	1.635	0.882	Be	Ca	Si	Si	Ga	In	In	Sc	2.409	0.496	Ca	Ba	Zr	Zr	Ga	Sc	Y	Y	2.836	0.526	Be	Mg	Ca	Cd	Si	Si	Ge	Ge	3.336	1.047	
Ca	Sr	Sn	Hf	In	In	Y	Y	1.635	1.001	Sr	Zn	Sn	Zr	Ga	Y	Y	Y	2.409	0.645	Ca	Ca	Ti	Hf	Al	Ga	Ga	Sc	2.836	0.692	Mg	Mg	Ca	Sr	Si	Sn	Sn	Zr	3.336	1.017	
Mg	Ca	Si	Sn	Ga	Ga	Ga	Y	1.636	1.007	Zn	Cd	Sn	Hf	Ga	Y	Y	Y	2.409	0.807	Mg	Cd	Sn	Zr	Al	Y	Y	Y	2.836	0.669	Mg	Ca	Zn	Cd	Si	Si	Si	Ge	3.336	1.306	
Sr	Cd	Ge	Zr	Ga	Ga	Ga	In	1.636	1.214	Mg	Mg	Si	Sn	Al	Al	In	Y	2.409	0.471	Ca	Ca	Zr	Hf	Al	In	Sc	Sc	2.836	0.493	Mg	Ca	Zr	Zr	Al	Y	Y	Y	3.336	1.039	
Sr	Zn	Cd	Cd	Si	Ge	Sn	Sn	1																																

Sr	Cd	Si	Zr	Al	In	In	In	1.653	1.012	Ba	Zn	Zn	Cd	Ge	Zr	Hf	Hf	2.416	0.900	Ba	Ba	Ti	Hf	Ga	Sc	Y	Y	2.840	0.836	Ca	Sr	Sr	Zn	Si	Ti	Ti	Zr	3.345	0.882
Zn	Cd	Sn	Sn	Ga	Ga	In	Y	1.653	0.777	Mg	Mg	Sn	Hf	Al	Al	In	Y	2.416	0.344	Mg	Ca	Si	Si	Al	Al	In	Y	2.840	0.409	Ca	Sr	Sr	Ba	Si	Sn	Hf	Hf	3.345	0.797
Mg	Ba	Sn	Ti	Ga	Al	In	Y	1.654	0.666	Mg	Ba	Cd	Ge	Zr	Al	Al	Ga	2.416	0.454	Mg	Ca	Si	Si	Al	Al	Ga	Y	2.840	0.620	Mg	Mg	Sr	Ba	Si	Sn	Zr	3.345	0.816	
Zn	Zn	Si	Sn	Ti	Ga	In	In	1.654	0.952	Ba	Ba	Ba	Cd	Sn	Zr	Hf	Hf	2.416	0.443	Be	Be	Ba	Ba	Zn	Si	Ge	Ge	Zr	2.840	0.684	Be	Be	Mg	Ba	Si	Zr	Zr	3.345	1.003
Sr	Cd	Sn	Ti	Ga	Ga	Y	Y	1.654	0.704	Ca	Ba	Si	Hf	Al	Ga	Ga	2.416	0.193	Ca	Cd	Ge	Hf	Sc	Sc	Y	Y	2.840	0.499	Be	Mg	Ca	Cd	Sn	Ti	Ti	Ti	3.345	0.862	
Be	Sr	Ge	Ti	Ga	In	In	In	1.654	0.638	Ca	Ba	Sn	Hf	Ga	Y	Y	2.416	0.420	Be	Zn	Ge	Ge	Ga	Sc	Sc	Y	2.840	0.762	Ca	Cd	Ti	Hf	Al	In	Sc	Sc	3.345	0.912	
Mg	Sr	Ge	Ge	Ga	In	In	Sc	1.654	0.940	Ba	Ba	Si	Ti	Al	Al	Ga	2.417	0.434	Be	Zn	Si	Si	Ga	Ga	In	Y	2.840	0.775	Be	Be	Si	Zr	Al	In	Sc	Sc	3.345	1.042	
Ba	Zn	Ge	Hf	Al	Al	In	In	1.654	0.691	Ba	Cd	Ge	Hf	Ga	Y	Y	2.417	0.166	Sr	Ba	Zn	Cd	Zr	Zr	Hf	Hf	2.840	0.484	Mg	Zn	Ge	Ti	Al	Y	Y	Y	3.345	0.883	
Ca	Sr	Ge	Ge	Al	Al	Ga	Y	1.654	0.737	Mg	Mg	Sn	Zr	Ga	In	In	Sc	2.417	0.414	Mg	Cd	Cd	Cd	Si	Sn	Zr	Hf	2.840	0.790	Be	Be	Sr	Ba	Sn	Ti	Zr	3.345	0.703	
Ba	Cd	Sn	Sn	Al	Sc	Y	Y	1.655	0.760	Be	Sr	Ti	Zr	In	In	Sc	Sc	2.417	0.607	Be	Sr	Ba	Cd	Ti	Ti	Ti	Hf	2.840	0.965	Be	Ca	Ca	Zn	Zr	Hf	Hf	3.345	0.674	
Ba	Ba	Sn	Zr	Al	Ga	Ga	In	1.655	0.459	Cd	Cd	Si	Sn	Al	Sc	Sc	Y	2.417	0.420	Ca	Ba	Cd	Cd	Ge	Ti	Ti	Ti	2.840	0.546	Be	Be	Zn	Zr	Si	Zr	Hf	Hf	3.346	0.729
Ba	Ba	Zn	Ge	Hf	In	In	Sc	1.655	0.717	Ca	Ba	Ge	Zr	Al	Al	Al	Sc	2.417	0.497	Ca	Cd	Ti	Zr	Al	Al	Ga	Ga	2.841	0.925	Mg	Zn	Zn	Zn	Ge	Sn	Ti	Hf	3.346	0.798
Sr	Sr	Sn	Zr	Al	Al	In	In	1.655	0.745	Ca	Cd	Cd	Cd	Si	Ge	Ge	Hf	2.417	0.562	Ca	Sr	Hf	Hf	Al	Ga	Sc	Sc	2.841	1.070	Be	Mg	Mg	Sr	Si	Sn	Sn	Hf	3.346	0.981
Be	Ba	Ge	Sn	Al	Al	Al	Y	1.656	0.439	Be	Zn	Sn	Ti	Si	Al	In	In	2.417	0.545	Be	Sr	Zr	Zr	Al	Ga	Ga	Y	2.841	0.403	Ca	Sr	Sr	Zn	Sn	Ti	Ti	Zr	3.346	0.911
Ba	Cd	Si	Si	Al	Al	In	In	1.656	0.899	Ca	Cd	Ge	Zr	Al	Al	Al	In	2.417	0.565	Sr	Ba	Hf	Hf	Al	Sc	Y	Y	2.841	0.531	Be	Zn	Si	Ti	Ga	Ga	Ga	Y	3.346	0.880
Be	Ba	Ge	Zr	In	In	Y	Y	1.656	0.900	Sr	Cd	Sn	Hf	Sc	Sc	Y	Y	2.417	0.487	Mg	Ba	Si	Hf	Al	Al	Y	Y	2.841	0.531	Ca	Ba	Ba	Si	Sn	Zr	Hf	Hf	3.346	1.010
Ba	Ba	Si	Sn	Al	Al	In	Sc	1.656	0.394	Be	Sr	Hf	Hf	Al	In	In	Y	2.417	0.384	Be	Ca	Ba	Cd	Si	Si	Hf	Hf	2.841	0.714	Mg	Cd	Ge	Zr	Al	Sc	Sc	Sc	3.346	0.920
Ba	Ba	Sn	Ti	Ga	In	In	Sc	1.656	0.841	Be	Cd	Si	Ge	Ga	Y	Y	2.418	0.537	Be	Be	Ca	Cd	Sn	Sn	Ti	Hf	2.841	0.642	Mg	Mg	Ca	Cd	Sn	Ti	Ti	Zr	3.346	0.691	
Ba	Ba	Sn	Hf	Al	Al	In	Y	1.657	1.028	Mg	Ca	Ge	Ti	Ga	Ga	Ga	In	2.418	0.475	Be	Mg	Sn	Zr	Ga	Ga	Ga	In	2.841	0.557	Ca	Sr	Sr	Zn	Ge	Ti	Ti	Hf	3.346	0.666
Mg	Ba	Sn	Hf	In	In	Sc	Sc	1.657	0.863	Be	Be	Ba	Zn	Ge	Sn	Zr	2.418	0.354	Mg	Mg	Si	Zr	Ga	Ga	Ga	In	2.841	0.881	Mg	Cd	Ti	Ti	Ga	Sc	Sc	Y	3.346	0.755	
Sr	Cd	Ge	Hf	Ga	Ga	Y	Y	1.657	0.672	Sr	Ba	Ba	Cd	Ge	Sn	Zr	2.418	0.532	Be	Cd	Sn	Hf	Al	Al	Al	Ga	2.841	0.802	Ca	Cd	Si	Zr	Sc	Y	Y	Y	3.346	0.747	
Ca	Sr	Ge	Hf	In	In	Sc	Sc	1.657	0.966	Zn	Zn	Sn	Zr	Ga	In	Y	2.418	0.628	Mg	Ca	Ti	Hf	Al	Al	In	In	2.841	0.627	Mg	Sr	Ba	Zn	Ti	Hf	Hf	Hf	3.346	0.741	
Mg	Ba	Si	Ge	In	In	Sc	Sc	1.657	0.788	Ba	Zn	Sn	Ti	Al	Al	Al	Ga	2.418	0.872	Ca	Ba	Si	Si	Al	Al	Ga	Sc	2.841	0.453	Be	Ca	Cd	Cd	Ti	Zr	Zr	Hf	3.347	0.955
Be	Zn	Si	Sn	Al	In	In	In	1.657	0.642	Ba	Cd	Hf	Hf	Ga	In	Y	2.418	0.786	Be	Ca	Zn	Cd	Ge	Ge	Zr	Hf	2.841	0.604	Mg	Ba	Ba	Zn	Ge	Ge	Ti	Ti	3.347	1.258	
Be	Ca	Si	Sn	Ga	Ga	Ga	In	1.657	0.954	Ca	Zn	Ti	Hf	Ga	Ga	In	In	2.418	0.533	Sr	Zn	Ti	Ti	In	Sc	Y	Y	2.841	0.561	Mg	Mg	Hf	Hf	Al	Ga	In	Sc	3.347	1.127
Ca	Zn	Ge	Ge	Ga	Ga	In	Sc	1.657	0.774	Ca	Zn	Ge	Ti	Al	Ga	Ga	Ga	2.418	0.717	Cd	Cd	Ti	Hf	Al	Ga	Sc	Sc	2.842	0.503	Mg	Mg	Si	Zr	Al	Al	In	Sc	3.347	0.986
Be	Mg	Sn	Sn	Al	In	In	Y	1.658	0.729	Be	Ca	Hf	Hf	Ga	In	Y	2.418	0.760	Mg	Cd	Zr	Zr	Zr	Al	Al	In	Y	2.842	0.739	Mg	Sr	Ba	Zn	Ti	Zr	Zr	Zr	3.347	0.738
Ba	Cd	Ge	Sn	In	Y	Y	Y	1.658	0.533	Mg	Mg	Ge	Hf	Al	In	Y	2.418	0.518	Cd	Cd	Zr	Hf	Al	Al	Ga	Sc	2.842	0.671	Be	Be	Sr	Ba	Ge	Zr	Zr	Hf	3.347	0.884	
Ba	Zn	Zn	Cd	Si	Sn	Sn	Zr	1.658	0.533	Sr	Cd	Si	Ge	In	Sc	Sc	2.418	0.687	Be	Be	Sn	Zr	Al	Al	In	Y	2.842	0.920	Ca	Ca	Zn	Si	Ge	Ti	Zr	Zr	3.347	0.749	
Be	Sr	Ge	Cd	Al	In	Y	Y	1.659	0.707	Ca	Cd	Ti	Ti	In	In	Sc	Y	2.418	0.754	Ca	Sr	Ti	Ti	In	Sc	Sc	Y	2.842	0.901	Be	Mg	Ba	Ba	Si	Si	Sn	Zr	3.347	0.819
Ba	Zn	Sn	Hf	Al	Al	Ga	Ga	1.659	0.744	Ca	Ba	Cd	Cd	Sn	Ti	Zr	2.418	0.421	Sr	Ba	Zr	Hf	Ga	Sc	Sc	Sc	2.842	0.802	Be	Be	Ca	Zn	Ge	Ti	Ti	Hf	3.347	0.892	
Ca	Zn	Si	Sn	Ga	Ga	Y	Y	1.659	0.512	Be	Cd	Ge	Ge	Al	In	Sc	Sc	2.418	0.376	Ca	Ca	Zr	Hf	Ga	Ga	In	Sc	2.842	0.480	Mg	Zn	Cd	Ti	Al	Al	Al	Ga	3.347	0.760
Ca	Ge	Sn	Al	Al	Ga	Ga	Sc	1.659	0.886	Mg	Mg	Sn	Ti	In	In	Sc	Y	2.418	0.444	Zn	Cd	Ge	Zr	Al	Y	Y	2.842	0.668	Mg	Mg	Zn	Zn	Sn	Ti	Ti	Zr	3.347	0.795	
Be	Cd	Sn	Sn	In	Sc	Y	Y	1.659	0.889	Ca	Cd	Ge	Ga	Ga	Sc	Sc	2.418	0.412	Mg	Ba	Cd	Cd	Ge	Ti	Ti	Hf	2.842	0.702	Be	Ca	Si	Si	Al	Al	Ga	Sc	3.347	1.052	
Zn	Cd	Sn	Sn	Al	Al	Ga	Sc	1.659	0.453	Ca	Sr	Ba	Cd	Sn	Sn	Zr	2.418	0.354	Be	Zn	Sn	Hf	Sc	Sc	Y	Y	2.842	0.544	Mg	Mg	Ca	Cd	Si	Ti	Ti	Hf	3.348	0.856	
Ba	Zn	Si	Hf	Al	Al	In	In	1.659	0.710	Zn	Cd	Ge	Ge	Ga	Sc	Sc	Y	2.418	0.438	Mg	Ba	Zr	Hf	Ga	Sc	Sc	Sc	2.842	0.794	Mg	Mg	Zn	Cd	Si	Ti	Ti	Zr	3.348	0.889
Mg	Sr	Ge	Ge	Al	Al	Ga	In	1.660	0.738	Ca	Ca	Zn	Cd	Si	Si	Sn	Ti	2.418	0.434	Be	Ba	Ba	Zn	Ge	Ge	Sn	Hf	2.842	0.797	Mg	Ca	Ge	Ti	Sc	Sc	Sc	Y	3.348	1.074
Be	Cd	Sn	Sn	Ga	Ga	Sc	Y	1.660	0.747	Ca	Cd	Si	Ti	In	In	Sc	Sc	2.418	0.426	Be	Zn	Zn	Cd	Sn	Zr	Hf	2.842	0.547	Mg	Zn	Cd	Cd	Si	Si	Zr	Hf	3.348	0.863	
Ca	Cd	Si	Sn	Ga	Ga	Ga	Sc	1.660	0.688	Be	Cd	Si	Hf	In	In	In	Sc	2.419	0.436	Mg	Sr	Ge	Zr	Al	Y	Y	Y	2.842	0.813	Mg	Ca	Sr	Ba	Sn	Sn	Sn	Hf	3.348	0.589
Be	Zn	Ge	In	In	In	In	Sc	1.660	0.723	Sr	Ba	Zr	Zn	In	In	Y	Y	2.419	0.563	Be	Sr	Ti	Hf	Al	Al	Ga	Ga	2.842	0.946	Be	Ca	Si	Si	Al	Ga	Sc	Sc	3.348	0.550
Be	Ca	Ge	Ge	Ga	Ga	In	Y	1.660	0.727	Ca	Ba	Zn	Zn	Si	Sn	Ti	2.419	0.456	Ca	Cd	Zr	Hf	Al	Al	Ga	Ga	2.843	0.583	Ca	Sr	Ba	Ba	Si	Sn	Hf	Hf	3.348	0.637	
Mg	Ca	Sn	Ti	In	In	In	Y	1.660	0.853	Sr	Zn	Ti	Zr	Al	Al	In	In	2.419	0.559	Be	Be	Ba	Cd	Si	Sn	Ti	Ti	2.843	0.932	Sr	Zn	Si	Ti	Sc	Y	Y	Y	3.348	0.799
Ba	Cd	Sn	Hf	Al	Al	Ga	Ga	1.661	0.855	Sr	Ba	Zn	Ti	In	In	Sc	Sc	2.419	0.602	Ca	Zn	Ge	Zr	Al	Al	Al	Sc	2.843	1.054	Mg	Ca	Sr	Zn	Ge	Hf	Hf	Hf	3.348	1.050
Sr	Ba	Sn	Hf	In	In	Sc	Sc	1.661	0.673	Mg	Ca	Cd	Cd	Ge	Ge	Sn	Zr	2.419	0.313	Mg	Sr	Zn	Zn	Ge	Ge	Sn	Zr	2.843	0.501	Be	Ba	Zn	Cd	Si	Si	Si	Hf	3.349	0.973
Be	Cd	Ge	Sn	Ga	Ga	Y	Y	1.661	0.813	Ba	Zn	Sn	Ti	Ga	Y	Y	Y	2.419	0.503	Be	Cd	Ti	Hf	Al	Y	Y	Y	2.843	0.638	Mg	Mg	Ba	Zn	Si	Ge	Hf	Hf	3.349	0.882
Sr	Sr	Sn	Ti	In	In	In	Sc	1.661	0.810	Sr	Cd	Sn	Hf	Sc	Sc	Sc	Y																						

Ca	Zn	Sn	Zr	Ga	Ga	In	In	1.679	-0.058	Be	Ca	Sr	Cd	Sn	Sn	Hf	Hf	2.424	0.781	Be	Sr	Zr	Hf	Al	Al	Ga	Ga	2.848	0.617	Mg	Mg	Si	Zr	Al	Al	Ga	Y	3.357	0.729	
Ca	Ca	Sn	Ti	Al	In	In	Y	1.679	0.133	Zn	Zn	Sn	Zr	Ga	In	Sn	Sc	Sc	2.424	0.789	Mg	Ca	Zn	Zn	Ge	Sn	Sn	Ti	2.848	0.911	Be	Zn	Zr	Zr	Al	Ga	Ga	Y	3.357	0.618
Sr	Cd	Sn	Sn	Al	In	Ga	Sc	1.679	0.146	Zn	Zn	Si	Ti	Al	Ga	In	In	2.425	0.895	Sr	Sr	Zi	Ti	Zr	In	Sc	Y	2.848	1.051	Ca	Sr	Ba	Ba	Sn	Sn	Ti	Zr	3.357	0.557	
Mg	Zn	Sn	Sn	Al	Ga	Y	Y	1.679	-0.109	Ca	Ca	Ge	Ti	Ga	In	Sc	Sc	2.425	0.785	Sr	Ba	Ti	Ti	Al	Ga	Sc	Sc	2.849	0.618	Mg	Mg	Si	Hf	Al	Ga	Ga	Sc	3.357	0.566	
Ca	Cd	Ge	Zr	In	In	Y	Y	1.680	0.124	Sr	Ba	Hf	Hf	Al	Ga	Ga	Y	2.425	0.820	Ba	Cd	Zr	Hf	Al	Al	Al	Ga	2.849	1.013	Be	Mg	Sr	Zn	Si	Si	Sn	3.357	0.629		
Ba	Ba	Si	Sn	Al	In	Sc	Sc	1.680	0.141	Sr	Zn	Zr	Zr	Ga	In	Sc	Sc	2.425	1.018	Mg	Ba	Zn	Cd	Sn	Hf	Hf	Hf	2.849	1.148	Be	Zn	Ti	Hf	In	Sc	Sc	Sc	3.357	0.817	
Ba	Ca	Sn	Sn	Ga	Sc	Sc	Y	1.680	-0.120	Mg	Ba	Hf	Hf	Al	Ga	In	In	2.425	0.709	Mg	Sr	Ba	Cd	Si	Ti	Ti	Ti	2.849	0.540	Mg	Zn	Zr	Zr	Al	Al	Sc	Y	3.357	0.748	
Be	Ba	Sn	Hf	Al	Al	In	In	1.680	0.279	Ca	Ca	Si	Ge	In	Sc	Sc	Y	2.425	0.734	Be	Mg	Zn	Zn	Ge	Sn	Sn	Hf	2.849	0.697	Ca	Cd	Ti	Zr	Sc	Sc	Sc	Y	3.357	0.705	
Be	Sr	Ge	Hf	Al	In	In	In	1.681	0.280	Zn	Ca	Ge	He	In	Y	Y	Y	2.425	0.893	Ca	Sr	Zr	Hf	In	Sc	Sc	Sc	2.849	0.716	Zn	Cd	Zr	Hf	Al	Al	Al	Sc	3.357	0.805	
Sr	Cd	Ge	Zr	Ga	Ga	Y	Y	1.681	-0.140	Ca	Ba	Cd	Cd	Ge	Ti	Hf	Hf	2.425	0.757	Hf	Cd	Ge	He	Sc	Sc	Y	Y	2.849	0.868	Be	Mg	Mg	Cd	Si	Ge	Ge	Hf	3.357	0.716	
Zn	Cd	Sn	Sn	Al	Ga	Sc	Sc	1.682	0.485	Zn	Ba	Cd	Cd	Ge	Zr	Hf	Hf	2.425	0.803	Mg	Ca	Zn	Cd	Si	Ge	Ge	Ge	2.849	0.792	Ca	Ca	Ba	Ba	Ge	Sn	Zr	Hf	3.357	0.599	
Mg	Ba	Si	Sn	Al	Al	Ga	Ga	1.682	0.449	Sr	Ba	Si	Zr	Al	Al	In	In	2.425	0.911	Sr	Cd	Si	Zr	Al	Al	Al	Ga	2.849	0.710	Be	Be	Ba	Zn	Si	Ge	Ti	Ti	3.357	0.541	
Ba	Zn	Si	Ge	In	In	Sc	Sc	1.682	0.220	Mg	Mg	Ge	He	Ga	Ga	In	Y	2.425	0.587	Ba	Ba	Zr	Hf	Al	Sc	Sc	Y	2.849	1.017	Ca	Sr	Sr	Zn	Ge	Ti	Ti	Zr	3.358	0.544	
Sr	Cd	Ge	Hf	In	In	Sc	Sc	1.682	0.413	Be	Sr	Si	Si	Al	In	Y	Y	2.425	0.749	Mg	Cd	Zr	Hf	In	In	Sc	Sc	2.849	0.945	Be	Mg	Mg	Cd	Si	Ge	Zr	Zr	3.358	0.614	
Ca	Ba	Sn	Zr	Ga	Ga	Ga	Y	1.682	0.433	Ba	Ba	Ba	Cd	Ge	Ge	Zr	Hf	2.425	0.903	Mg	Sr	Zr	Hf	Al	Al	Y	Y	2.849	0.774	Mg	Mg	Mg	Sr	Si	Ge	Sn	Zr	3.358	0.573	
Ba	Ba	Ge	Hf	Al	Ga	Ga	Y	1.682	0.188	Mg	Ba	Zr	Hf	Ga	Ga	In	In	2.425	0.555	Ca	Ba	Ba	Zn	Si	Sn	Sn	Ti	2.849	0.567	Mg	Ca	Ti	Hf	Al	Al	Sc	Sc	3.358	0.705	
Mg	Sr	Ge	Hf	In	In	In	Sc	1.682	0.399	Sr	Ba	Zn	Cd	Si	Si	Si	Zr	2.425	0.739	Be	Sr	Zn	Zn	Si	Sn	Sn	Hf	2.849	0.749	Ca	Zn	Si	Zr	Sc	Sc	Sc	Y	3.358	1.016	
Ca	Ba	Ge	Zr	In	In	In	Sc	1.682	0.430	Ca	Sr	Zn	Zn	Si	Sn	Zr	Zr	2.426	1.089	Sr	Sr	Sr	Zn	Si	Ge	Sn	Zr	2.849	0.709	Be	Be	Mg	Ba	Sn	Ti	Zr	Zr	3.358	0.871	
Sr	Cd	Si	Ge	Ga	Ga	Y	Y	1.682	0.184	Ca	Sr	Si	Sn	Al	Sc	Sc	Sc	2.426	0.893	Ca	Ba	Si	Si	In	Sc	Sc	Y	2.849	0.576	Ca	Sr	Ba	Zn	Zr	Hf	Hf	Hf	3.358	0.811	
Sr	Ba	Sn	Hf	Ga	Ga	In	In	1.683	0.228	Ca	Sr	Cd	Cd	Si	Si	Ti	Zr	2.426	0.886	Be	Zn	Ge	Al	Al	Sc	Y	Y	2.849	0.864	Be	Ca	Ba	Zn	Sn	Ti	Ti	Zr	3.358	0.634	
Ba	Zn	Ge	Ge	Al	In	Sc	Sc	1.683	0.247	Be	Ca	Sn	Zr	Al	Al	Y	Y	2.426	1.029	Be	Mg	Sn	Ti	In	In	Sc	Sc	2.850	0.807	Be	Mg	Cd	Cd	Ge	Ti	Ti	Zr	3.358	0.695	
Sr	Ba	Ge	Al	Al	Al	Sc	Sc	1.684	0.156	Ca	Ca	Si	Zr	Ga	In	Y	Y	2.426	0.964	Sr	Cd	Ge	Ti	In	Al	Y	Y	2.850	1.040	Ca	Ca	Sr	Ba	Sn	Zr	Hf	Hf	3.358	0.645	
Zn	Zn	Si	Sn	Ga	Ga	In	Y	1.684	0.218	Mg	Sr	Si	Sn	Al	Sc	Sc	Sc	2.426	0.981	Be	Cd	Ge	Zr	Ga	Ga	Ga	Sc	2.850	1.034	Sr	Ba	Ba	Si	Ge	Zr	Hf	Hf	3.359	0.706	
Be	Ba	Sn	Hf	Ga	Ga	In	In	1.684	0.242	Mg	Cd	Ti	Zr	In	In	Y	Y	2.426	0.979	Cd	Cd	Ti	Hf	Al	Al	Al	Ga	Sc	2.850	0.936	Be	Ba	Zn	Zn	Sn	Ti	Ti	Hf	3.359	0.678
Ca	Ba	Sn	Zr	In	In	Y	Y	1.684	0.145	Ca	Cd	Ge	Hf	Al	Al	Al	Y	2.426	0.789	Mg	Ba	Zn	Cd	Sn	Zr	Zr	Zr	2.850	0.579	Be	Be	Mg	Zn	Si	Zr	Zr	Hf	3.359	0.633	
Ba	Zn	Sn	Ti	Al	Al	In	In	1.685	0.372	Ca	Ba	Si	Si	Ga	In	Sc	Sc	2.426	0.938	Zn	Cd	Zr	Zr	In	Sc	Sc	Y	2.850	0.802	Be	Cd	Ti	Zr	Sc	Sc	Sc	Y	3.359	0.680	
Be	Cd	Si	Ge	In	In	In	Y	1.685	0.374	Mg	Cd	Si	Hf	Al	Al	In	In	2.427	0.970	Ca	Zn	Zn	Cd	Si	Ge	Ti	Ti	2.850	0.838	Zn	Zn	Si	Ti	Al	Sc	Y	Y	3.359	0.866	
Ca	Ca	Si	Ge	In	In	Y	Y	1.685	0.125	Be	Ba	Ti	Hf	Ga	Ga	In	In	2.427	0.756	Be	Ca	Ti	Ti	Al	In	In	Sc	2.850	0.603	Mg	Ba	Zn	Cd	Zr	Sc	Hf	Hf	3.359	0.767	
Mg	Ca	Ge	Ge	Ga	In	Y	Y	1.685	0.269	Zn	Cd	Si	Si	Ga	Ga	In	Sc	2.427	0.930	Sr	Zn	Zn	Zn	Ge	Ti	Zr	Hf	2.850	0.907	Mg	Ca	Zn	Zn	Sn	Ti	Zr	Zr	3.359	0.766	
Mg	Sr	Ge	Hf	Ga	In	In	In	1.685	0.281	Cd	Cd	Hf	Hf	Ga	In	Sc	Y	2.427	1.070	Mg	Zn	Cd	Cd	Cd	Sn	Ti	Ti	2.850	0.921	Mg	Ca	Zn	Cd	Ti	Zr	Hf	Hf	3.359	0.863	
Sr	Sr	Si	Sn	Al	Al	Ga	Sc	1.685	0.506	Be	Cd	Ge	He	In	In	Sc	Sc	2.427	1.247	Mg	Ca	Zr	Hf	Al	Al	In	In	2.850	0.631	Zn	Zn	Si	Ti	Al	Ga	Sc	Sc	3.359	0.750	
Be	Ba	Si	Sn	In	In	In	Y	1.686	0.259	Ca	Cd	Cd	Cd	Si	Sn	Ti	Hf	2.427	0.244	Ca	Sr	Si	Ti	Ga	Ga	Sc	Sc	2.850	0.919	Ca	Zn	Si	Si	Al	Sc	Sc	Y	3.359	0.646	
Be	Cd	Sn	Zr	Ga	In	In	In	1.686	0.276	Ca	Ba	Sn	Ti	In	Y	Y	Y	2.427	1.019	Ca	Sr	Si	Zr	In	Y	Y	Y	2.850	1.054	Be	Zr	Ge	Hf	Al	Al	Sc	Y	3.359	0.586	
Mg	Sr	Ge	Ge	Al	Ga	Ga	Sc	1.686	0.497	Be	Sr	Zn	Zn	Zi	Ga	Sc	Sc	Sc	2.427	1.085	Be	Ca	Ba	Cd	Ge	Ge	Ge	Ti	2.850	0.629	Be	Be	Mg	Ba	Ge	Sn	Hf	Hf	3.359	0.596
Mg	Zn	Si	Ge	Al	Ga	In	In	1.686	0.397	Sr	Sr	Zn	Zn	Si	Ge	Sn	Ti	2.427	1.202	Ba	Cd	Zr	Hf	In	Sc	Sc	Sc	2.850	1.018	Mg	Sr	Zn	Zn	Sn	Zr	Zr	Hf	3.360	0.647	
Mg	Zn	Si	Sn	In	In	In	Sc	1.686	0.398	Ca	Zn	Ge	Ti	Ga	Ga	Sc	Sc	2.427	1.009	Zn	Cd	Si	Hf	Ga	Ga	Sc	Sc	2.850	1.150	Be	Ca	Sr	Zn	Ti	Ti	Hf	Hf	3.360	0.826	
Sr	Zn	Cd	Cd	Si	Sn	Sn	Hf	1.687	0.489	Sr	Sr	Zn	Cd	Si	Ti	Zr	Zr	2.427	1.053	Mg	Ca	Ba	Cd	Ci	Zr	Zr	Zr	2.850	0.559	Be	Be	Mg	Ba	Sn	Ti	Ti	Hf	3.360	0.760	
Ba	Ba	Zn	Cd	Ge	Sn	Sn	Sn	1.687	0.093	Mg	Ca	Si	Ti	In	In	Y	Y	2.427	1.194	Ca	Zn	Hf	Hf	Al	Al	In	Sc	2.851	0.716	Ca	Ba	Ba	Sn	Ti	Zr	Hf	Hf	3.360	0.721	
Be	Ca	Ge	Zr	Al	Ga	Ga	Sc	1.687	0.090	Ca	Ca	Ge	Zr	Al	Al	Ga	Sc	2.427	0.817	Be	Mg	Ba	Cd	Ci	Si	Si	Sn	2.851	0.738	Mg	Zn	Sn	Ti	Ga	Sc	Sc	Sc	3.360	0.815	
Be	Mg	Sn	In	In	Sc	Y	1.688	-0.026	Mg	Cd	Ge	Ti	Ga	Ga	Y	Y	2.427	0.719	Sr	Ba	Zn	Cd	Zr	Zr	Zr	Hf	2.851	0.680	Ca	Sr	Sr	Sr	Ge	Sn	Zr	Hf	3.360	0.728		
Sr	Ba	Zn	Cd	Si	Si	Sn	Sn	1.688	0.447	Ba	Ba	Ti	Hf	Al	Al	Ga	Y	2.427	0.774	Ba	Cd	Si	Hf	Sc	Sc	Sc	Y	2.851	0.640	Mg	Zn	Si	Si	In	Sc	Sc	Y	3.360	0.623	
Be	Sr	Ge	Hf	In	In	Y	Y	1.688	0.368	Be	Ba	Ti	Zr	Ga	Y	Y	Y	2.427	0.814	Be	Zn	Zr	Zr	Ga	Sc	Y	Y	2.851	0.539	Mg	Cd	Ti	Hf	Sc	Y	Y	Y	3.360	0.565	
Ba	Ba	Si	Sn	Al	In	Y	Y	1.688	0.252	Sr	Ba	Cd	Cd	Ge	Ti	Ti	Zr	2.427	0.695	Ca	Ca	Zr	Hf	In	Sc	Y	Y	2.851	0.839	Be	Mg	Sn	Ti	Sc	Sc	Y	Y	3.360	0.566	
Sr	Ba	Ge	Ge	Ga	Ga	Sc	Y	1.689	0.259	Mg	Sr	Ge	Zr	Al	Al	Ga	Ga	2.427	0.762	Mg	Mg	Ca	Cd	Ge	Ge	Sn	Hf	2.851	0.790	Be	Cd	Cd	Cd	Si	Ge	Ti	Hf	3.360	0.637	
Ca	Sr	Sn	Sn	Al	Sc	Sc	Y	1.689	0.344	Sr	Sr	Sr	Cd	Si	Ge	Sn	Hf	2.427	0.782	Be	Cd	Ge	Hf	Al	Al	Al	In	2.851	0.567	Mg	Mg	Ti	Hf	In	Sc	Sc	Y	3.360	0.598	
Ba	Zn	Ge	Ge	Al	Al	In</																																		

Ba	Cd	Si	Zr	Ga	In	In	1.708	0.661	Ca	Zn	Sn	Zr	Al	Al	Al	In	2.434	1.047	Mg	Zn	Zn	Cd	Sn	Sn	Ti	Hf	2.856	0.599	Mg	Sr	Zn	Zn	Si	Ti	Hf	Hf	3.369	0.501	
Ca	Ba	Ge	Hf	Al	In	In	1.708	0.668	Sr	Sr	Ba	Cd	Si	Sn	Sn	Zr	2.434	0.725	Mg	Ca	Ba	Cd	Si	Si	Hf	Hf	2.856	0.576	Be	Mg	Sn	Ti	In	Sc	Sc	3.369	0.434		
Mg	Mg	Ge	Sn	Al	In	In	1.708	0.242	Ca	Ba	Ba	Cd	Ge	Sn	Sn	Zr	2.434	0.756	Mg	Ca	Si	Hf	In	Y	Y	Y	2.856	0.970	Be	Mg	Sr	Ba	Si	Si	Ge	Sn	3.369	0.495	
Sr	Cd	Si	Si	Al	In	In	1.708	0.895	Ca	Ba	Zn	Zn	Sn	Sn	Ti	Hf	2.434	0.880	Mg	Sr	Cd	Cd	Si	Ti	Hf	Hf	2.857	0.850	Be	Mg	Mg	Zn	Si	Si	Sn	Hf	3.369	0.497	
Sr	Zn	Ge	Ge	Al	Al	Ga	Y	0.812	Sr	Cd	Zr	Zr	Ga	Ga	In	Sc	2.434	0.691	Be	Be	Ba	Cd	Si	Ge	Zr	Zr	2.857	0.635	Be	Be	Ba	Zn	Ti	Ga	Sc	Y	3.369	0.487	
Ba	Zn	Ge	Zr	Ga	Ga	Ga	Y	1.708	Be	Zn	Ge	Hf	Ga	Ga	Y	Y	2.434	0.723	Be	Ba	Ti	Hf	Sc	Si	Y	Y	2.857	1.212	Ca	Zn	Ti	Hf	Al	Al	Al	Sc	3.369	0.521	
Mg	Sr	Sn	Ti	In	In	Y	1.708	0.808	Be	Zn	Ge	Sn	Ga	Ga	Sc	Sc	2.434	0.870	Be	Be	Sr	Ba	Si	Sn	Sn	Ti	2.857	1.028	Be	Mg	Ba	Cd	Si	Si	Si	Ti	3.369	0.461	
Sr	Zn	Sn	Ti	Ge	Ga	Y	1.708	0.796	Ba	Ba	Zn	Cd	Ge	Zr	Hf	Hf	2.434	0.756	Ca	Ba	Si	Zr	Al	Al	Al	Ga	2.857	0.696	Mg	Mg	Si	Ti	Al	Ga	In	3.370	0.517		
Sr	Zn	Zn	Cd	Si	Ge	Sn	Sn	0.530	Sr	Ba	Sn	Ti	Al	Al	Sc	Sc	2.434	0.759	Mg	Sr	Cd	Cd	Sn	Ti	Ti	Hf	2.857	0.380	Mg	Ca	Zn	Zn	Ge	Ti	Hf	Hf	3.370	0.514	
Ba	Zn	Ge	Sn	Al	Al	Y	1.709	0.790	Mg	Cd	Si	Ge	Ga	Ga	Sc	2.434	0.778	Be	Mg	Sr	Ba	Ge	Ge	Sn	Sn	2.857	0.459	Be	Be	Be	Ca	Si	Ge	Sn	Ti	3.370	0.513		
Ca	Zn	Sn	Sn	Al	Al	Ga	Sc	1.709	0.793	Be	Sr	Si	Zr	Al	In	In	2.434	1.117	Be	Mg	Si	Ti	Ga	In	In	In	2.857	0.458	Be	Be	Mg	Sr	Sn	Sn	Ti	Hf	3.370	0.571	
Sr	Ba	Si	Ge	In	Al	Y	1.709	0.524	Be	Be	Sr	Zn	Si	Ge	Sn	Sn	2.435	1.054	Be	Be	Ti	Hf	Al	In	Y	Y	2.857	0.464	Be	Ca	Ca	Zn	Sr	Zr	Hf	3.370	0.296		
Ca	Cd	Ge	Ti	In	In	In	1.709	0.635	Be	Sr	Sn	Hf	Al	Al	Al	Sc	2.435	1.168	Mg	Cd	Si	Sn	Sc	Y	Y	Y	2.857	0.567	Be	Zn	Cd	Cd	Ge	Ge	Ti	Zr	3.370	0.436	
Be	Ca	Si	Ge	Al	In	In	1.709	0.681	Ba	Ba	Zn	Ti	Ti	Al	Al	In	Y	2.435	1.049	Cd	Ca	Ti	Hf	Al	Al	Ga	In	2.857	0.519	Be	Be	Si	Ge	Al	Ga	In	3.370	0.492	
Mg	Ca	Sn	Sn	Al	Ga	Sc	1.709	0.552	Ca	Cd	Cd	Cd	Ge	Sn	Ti	Hf	2.435	0.890	Be	Ba	Cd	Cd	Sn	Ti	Ti	Zr	2.857	1.331	Be	Ca	Zn	Zn	Sn	Ti	Hf	Hf	3.370	0.896	
Zn	Cd	Si	Sn	Al	Ga	Ga	1.709	0.619	Be	Mg	Zn	Cd	Ge	Sn	Sn	Zr	2.435	1.102	Be	Be	Ca	Cd	Si	Zr	Hf	Hf	2.857	1.257	Be	Sr	Sr	Zn	Si	Si	Ti	Hf	3.370	0.950	
Mg	Ca	Sn	Sn	Ga	Sc	Sc	Y	1.710	0.676	Ba	Zn	Zn	Cd	Ti	Zr	Hf	Hf	2.435	1.042	Zn	Cd	Si	Hf	Ga	Y	Y	Y	2.858	1.129	Sr	Ba	Si	Zr	Sc	Y	Y	Y	3.370	0.657
Ca	Cd	Ge	Ge	Ga	Ga	Sc	Y	1.710	0.541	Sr	Ba	Zn	Zn	Si	Sn	Ti	2.435	1.085	Zn	Zn	Zn	Cd	Si	Sn	Ti	Zr	2.858	0.509	Mg	Cd	Ti	Zr	In	Sc	Sc	Sc	3.370	0.786	
Mg	Cd	Si	Ge	Al	In	In	1.710	0.753	Sr	Cd	Ti	Ti	Al	Ga	Ga	Y	2.435	1.234	Ca	Ca	Sr	Zn	Si	Sn	Sn	Hf	2.858	0.675	Be	Mg	Mg	Zr	Zr	Ga	Ga	Ga	Y	3.370	0.859
Ba	Zn	Si	Ge	Al	Al	In	1.710	0.762	Sr	Sr	Si	Zr	Ga	In	Sc	Sc	2.435	0.791	Mg	Mg	Ba	Zn	Ge	Sn	Sn	Hf	2.858	0.856	Be	Cd	Ti	Zr	Al	Al	Al	Sc	3.370	1.311	
Ca	Sr	Zn	Cd	Ge	Ge	Sn	Sn	1.711	0.509	Mg	Sr	Si	Ti	Ga	Ga	In	2.435	0.879	Mg	Sr	Sr	Zn	Si	Si	Ge	Sn	2.858	0.609	Ca	Sr	Si	Ti	Al	Sc	Sc	Sc	3.370	1.352	
Ba	Cd	Sn	Hf	Al	Al	Y	1.711	0.728	Be	Sr	Ge	Zr	Al	Al	Ga	Ga	2.435	1.204	Be	Ca	Ge	Hf	Al	Al	Al	Y	2.858	0.777	Mg	Zn	Zn	Zn	Si	Sn	Ti	Hf	3.370	1.100	
Ba	Ba	Sn	Al	Ti	Al	Ga	Sc	1.711	0.775	Ca	Sr	Ge	Ti	Al	Al	Ga	Ga	2.435	0.749	Mg	Ba	Ba	Zn	Sn	Sn	Ti	Zr	2.858	0.896	Be	Be	Ca	Sr	Ti	Zr	Zr	Hf	3.370	1.212
Ba	Cd	Ge	Ge	Al	Al	Ga	Sc	1.711	0.986	Mg	Sr	Si	Zr	Ga	Ga	Y	2.435	0.840	Ca	Ca	Si	Ti	Al	In	Sc	Sc	2.858	0.602	Be	Mg	Zn	Cd	Ge	Ge	Ge	Ti	3.371	1.271	
Zn	Cd	Si	Ga	Ga	Ga	Y	1.711	0.711	Ca	Ba	Zn	Zn	Ge	Ge	Sn	Hf	2.435	1.197	Ca	Sr	Sr	Cd	Si	Si	Ge	Hf	2.858	0.903	Be	Be	Mg	Sr	Ti	Zr	Zr	Hf	3.371	0.638	
Mg	Ba	Cd	Cd	Si	Ge	Sn	Sn	1.712	0.770	Sr	Zn	Ge	Hf	Al	Al	Al	Sc	2.435	1.044	Sr	Ba	Sn	Ti	Sc	Y	Y	Y	2.858	1.202	Ca	Sr	Sr	Ba	Sn	Zr	Zr	Hf	3.371	0.666
Ca	Cd	Ge	Ti	Ga	Ga	In	1.712	0.977	Ca	Ba	Ba	Cd	Si	Sn	Sn	Ti	2.435	0.952	Mg	Zn	Si	Zr	Ga	Ga	Ga	In	2.858	0.675	Mg	Ca	Zn	Zn	Si	Ge	Ti	Ti	3.371	0.534	
Sr	Cd	Si	Ti	Al	In	In	1.712	0.824	Ca	Zn	Si	Ge	In	Y	Y	Y	2.435	1.052	Zn	Zn	Zr	Hf	Ga	Ga	In	Sc	2.858	0.999	Be	Ca	Si	Zr	Sc	Sc	Sc	Y	3.371	0.650	
Mg	Sr	Zn	Cd	Ge	Sn	Sn	1.712	0.833	Mg	Ca	Si	Ti	Al	In	In	In	2.435	1.005	Mg	Ba	Cd	Cd	Si	Si	Ge	Ti	2.858	1.256	Be	Ba	Ba	Ti	Ge	Sn	Ti	Hf	3.371	0.636	
Mg	Sr	Zn	Cd	Ge	Al	In	Y	1.712	0.945	Sr	Sr	Ti	Ti	Ga	In	Sc	Y	2.435	1.132	Ca	Sr	Zr	Hf	Al	Al	Y	2.858	0.412	Mg	Cd	Ti	Al	Ga	Sc	Sc	3.371	0.689		
Ba	Ba	Cd	Cd	Si	Sn	Zr	Hf	1.712	0.594	Ca	Zn	Si	Sn	Al	Al	Al	Y	2.436	1.183	Ca	Sr	Sr	Cd	Sn	Ti	Ti	Hf	2.858	0.488	Be	Be	Mg	Ba	Si	Sn	Hf	Hf	3.371	0.696
Sr	Sr	Cd	Ge	Ti	Ga	Ga	In	1.713	0.597	Be	Ca	Cd	Cd	Ge	Sn	Ti	Y	2.436	0.737	Ca	Sr	Ge	Ti	Al	Al	Sc	Sc	2.858	0.487	Ca	Zn	Ti	Zr	Sc	Sc	Y	Y	3.371	0.634
Sr	Ba	Ge	Hf	Ga	In	In	1.713	0.506	Ba	Zn	Zr	Hf	In	In	Sc	Sc	2.436	0.912	Ba	Cd	Si	Si	Al	Sc	Y	Y	2.858	1.122	Be	Cd	Cd	Cd	Ge	Ti	Zr	Hf	3.371	0.732	
Sr	Sr	Sn	Ti	Al	Ga	In	1.713	0.285	Ba	Cd	Ti	Ti	Al	Al	Ga	In	2.436	1.154	Mg	Ca	Cd	Cd	Sn	Ti	Zr	Zr	2.858	1.021	Mg	Cd	Ge	Ti	Ga	Sc	Sc	Sc	3.371	0.687	
Ca	Cd	Ge	Sn	Al	Al	Al	1.713	0.306	Ba	Cd	Ge	Ti	Al	Al	Sc	Sc	2.436	0.692	Be	Ca	Ba	Cd	Cd	Si	Si	Zr	Zr	2.858	0.830	Mg	Ba	Si	Ti	Sc	Sc	Y	Y	3.371	0.706
Be	Ca	Ba	Cd	Ge	Sn	Sn	1.713	0.183	Ca	Ca	Ba	Cd	Si	Ge	Ge	Sn	2.436	0.870	Ca	Ba	Ba	Zn	Si	Ge	Zr	Zr	2.858	1.348	Mg	Bn	Cd	Cd	Si	Zr	Zr	Hf	3.371	0.709	
Zn	Cd	Si	Sn	In	In	Sc	1.714	0.283	Be	Ca	Ba	Zn	Si	Si	Sn	Sn	2.436	1.148	Mg	Zn	Cd	Cd	Ge	Sn	Zr	Zr	2.858	1.193	Be	Be	Si	Ge	Ga	Sc	Sc	Y	3.371	0.656	
Ba	Ba	Sn	Hf	Ga	Ga	In	1.714	0.303	Be	Ca	Cd	Cd	Ge	Sn	Hf	Hf	2.436	1.014	Ca	Zn	Hf	Hf	Ga	In	Sc	Sc	2.858	0.889	Be	Zn	Ge	Zr	Ga	Sc	Sc	Sc	3.371	0.751	
Sr	Sr	Ge	Hf	In	In	Sc	Y	1.714	0.170	Mg	Ca	Ba	Cd	Sn	Sn	Zr	2.436	1.258	Be	Cd	Ti	Ti	Al	Ga	Ga	In	2.858	0.603	Be	Zn	Cd	Cd	Ga	Si	Ti	Zr	3.371	0.703	
Be	Zn	Sn	Sn	Al	In	In	1.714	0.165	Sr	Zn	Ge	Zr	Al	Al	Sc	Sc	2.436	1.200	Be	Cd	Si	Ti	In	Y	Y	Y	2.859	0.684	Mg	Mg	Zn	Cd	Si	Si	Ti	Zr	3.372	0.616	
Cd	Cd	Si	Sn	Ga	In	In	1.714	0.254	Mg	Ba	Si	Zr	Al	Al	In	In	2.436	0.733	Be	Ca	Hf	Hf	Ga	Sc	Sc	Y	2.859	0.677	Ca	Ca	Sr	Ba	Sn	Ti	Zr	Zr	3.372	0.647	
Mg	Cd	Ge	Ge	In	In	Sc	Y	1.714	0.120	Ca	Ba	Cd	Cd	Si	Sn	Hf	Hf	2.436	1.031	Mg	Zn	Cd	Cd	Ge	Al	Sc	Y	2.859	0.667	Be	Zn	Si	Hf	Ga	Ga	Sc	Sc	3.372	0.396
Ca	Sr	Ge	Zr	In	In	Sc	1.714	0.145	Ba	Ba	Zn	Cd	Sn	Zr	Zr	Hf	2.436	1.164	Ca	Zn	Cd	Cd	Ge	Ti	Ti	Hf	2.859	0.781	Be	Ca	Ti	Zr	Al	Sc	Sc	Sc	3.372	0.535	
Ba	Zn	Ge	Ge	Al	Al	Ga	Y	1.714	0.246	Ca	Zn	Ti	Zr	In	In	In	2.436	0.687	Mg	Sr	Sr	Zn	Ge	Sn	Zr	Zr	2.859	0.735	Mg	Ca	Sr	Zn	Sr	Zr	Zr	Zr	3.372	0.555	
Mg	Ba	Sn	Zr	Al	In	In	1.714	0.113	Mg	Zn	Sn	Zr	In	In	Sc	Sc	2.436	0.988	Be	Cd	Sn	Hf	Sc	Sc	Sc	Y	2.859	1.464	Be	Sr	Sr	Zn	Si	Si	Ge	Hf	3.372	0.976	
Ca	Zn	Ge	Zr	Al	In	In	1.714	0.523	Sr	Zn	Zr	Zr	Zr	Al	In	In	2.437	1.156	Sr	Ba	Ti	Ti	Ga	Sc	Sc	Y	2.859	1.399	Mg	Zn	Zn	Zn	Ge	Sn	Ti	Zr	3.372	1.004	
Sr	Sr																																						

Mg	Mg	Ge	Sn	Ga	In	In	Sc	1.730	0.863	Ca	Sr	Ti	Hf	In	In	Sc	Sc	2.443	0.655	Mg	Zn	Ti	Ti	Al	In	Y	Y	2.865	0.601	Be	Be	Ca	Zn	Ge	Ti	Ti	Zr	3.381	0.597	
Ca	Sr	Ge	Hf	Al	In	In	In	1.730	0.633	Ba	Zn	Sn	Zr	Sc	Sc	Y	Y	2.443	0.586	Be	Be	Si	Sn	Ga	Ga	In	Sc	2.865	0.448	Mg	Sr	Zn	Sn	Ti	Ti	Zr	3.381	0.565		
Mg	Sr	Ge	Cd	Si	Sn	Sn	Sn	1.730	0.700	Ca	Cd	Sn	Zr	In	Y	Y	Y	2.443	0.446	Cd	Cd	Ge	Ti	Al	Sc	Y	Y	2.865	0.548	Mg	Sr	Zn	Cd	Ge	Ti	Zr	Zr	3.381	0.704	
Ca	Cd	Si	Hf	In	In	In	Y	1.730	0.854	Ca	Cd	Si	Sn	Ga	Ga	Ga	Y	2.443	0.260	Sr	Sr	Sr	Zn	Si	Ge	Zr	HF	2.866	0.523	Mg	Mg	Ca	Ba	Si	Ge	Ge	Sn	3.381	0.698	
Cd	Cd	Ge	Sn	In	Sc	Y	Y	1.730	0.623	Mg	Sr	Zr	Zr	Al	In	Y	Y	2.443	0.267	Mg	Zn	Hf	Hf	Al	Ga	Y	Y	2.866	0.490	Mg	Mg	Ge	Ti	Al	Al	Sc	Y	3.382	0.326	
Mg	Ba	Ge	Sn	Al	Al	Al	Al	1.731	0.683	Ca	Ba	Hf	Hf	Ga	In	Sc	Sc	2.443	0.263	Mg	Ba	Zn	Zn	Ge	Ge	Sn	Ti	2.866	0.646	Be	Be	Ba	Ba	Ge	Sn	Ti	Zr	3.382	0.456	
Mg	Cd	Ge	Ge	Al	In	In	Sc	1.731	0.659	Mg	Ba	Sn	Zr	Ga	Sc	Sc	Sc	2.443	0.578	Ca	Ba	Zn	Zn	Si	Sn	Hf	HF	2.866	0.604	Be	Zn	Ge	Ti	Sc	Y	Y	Y	3.382	0.527	
Be	Ba	Ge	Ti	In	In	Y	Y	1.731	0.441	Be	Cd	Si	Hf	Al	Al	In	In	2.443	0.513	Mg	Sr	Zn	Cd	Si	Si	Zr	Zr	2.866	0.853	Be	Ca	Zn	Cd	Si	Ti	Ti	Ti	3.382	1.031	
Be	Cd	Ge	Ge	Ga	In	Y	Y	1.731	0.676	Sr	Ba	Hf	Hf	Ga	Ga	In	Y	2.443	0.354	Ca	Zn	Cd	Cd	Si	Zr	Hf	HF	2.866	0.822	Mg	Mg	Mg	Cd	Si	Ti	Zr	HF	3.382	1.022	
Mg	Mg	Si	Sn	Ga	In	Y	Y	1.732	0.669	Be	Sr	Ti	Ti	Al	In	Y	Y	2.443	0.331	Mg	Sr	Si	Hf	In	Sc	Sc	Sc	2.866	0.729	Be	Zn	Cd	Cd	Ti	Zr	Hf	HF	3.382	0.647	
Ca	Ba	Sn	Ti	Ga	Ga	Ga	Y	1.732	0.425	Ca	Sr	Si	Hf	Ga	In	Sc	Sc	2.443	0.483	Cd	Cd	Ti	Zr	In	Sc	Sc	Y	2.866	0.456	Sr	Ba	Ba	Ba	Si	Ti	Zr	HF	3.383	0.768	
Be	Ba	Sn	Zr	Al	Al	Al	In	1.732	0.883	Be	Zn	Zn	Cd	Si	Ge	Sn	Sn	2.444	0.606	Be	Ca	Sn	Zr	Al	Al	Al	Sc	2.866	0.563	Mg	Sr	Ba	Zn	Ge	Si	Ge	Zr	3.383	0.856	
Cd	Cd	Ge	Sn	Al	Al	Ga	Sc	1.732	0.876	Zn	Zn	Zr	Hf	Al	Ga	In	In	2.444	0.618	Mg	Sr	Sr	Zn	Si	Sn	Sn	Zr	2.866	0.618	Be	Be	Mg	Zn	Ge	Ti	HF	HF	3.383	1.386	
Sr	Ba	Ge	Sn	In	Sc	Sc	Sc	1.732	0.420	Sr	Sr	Si	Hf	Al	Al	In	Sc	2.444	0.722	Be	Sr	Zr	HF	Sc	Sc	Y	Y	2.866	0.516	Ca	Ca	Ba	Zn	Ge	Ti	Ti	Zr	3.383	1.366	
Ca	Ba	Ge	Sn	In	Sc	Sc	Sc	1.733	0.631	Sr	Sr	Sr	Cd	Si	Ge	Sn	Zr	2.444	0.710	Be	Ba	Zn	Cd	Sn	HF	HF	HF	2.866	0.653	Be	Be	Mg	Sr	Ge	Zr	Zr	HF	3.383	1.040	
Ca	Sr	Ge	Sn	Al	Al	Al	Sc	1.733	0.601	Ca	Ba	Ba	Cd	Ge	Ge	Zr	HF	2.444	0.387	Be	Ba	Ca	Cd	Ge	Zr	Zr	HF	2.866	0.685	Be	Ca	Ca	Zn	Ge	Ti	HF	HF	3.383	1.139	
Be	Ba	Si	Ge	Al	Al	In	In	1.733	0.690	Sr	Zn	Zn	Zn	Ge	Sn	Zr	HF	2.444	0.408	Ca	Ca	Zr	Zr	Al	Ga	In	Sc	2.866	0.524	Be	Mg	Hf	Al	In	Sc	Sc	Sc	3.384	1.209	
Ba	Ba	Si	Ge	Ga	Ga	Ga	In	1.733	0.624	Be	Zn	Si	Zr	Ga	In	In	Y	2.444	0.321	Be	Cd	Hf	HF	Ga	Ga	In	Sc	2.866	0.723	Be	Ca	Si	Ti	Ga	Sc	Sc	Sc	3.384	0.763	
Mg	Sr	Sn	Ti	Ga	Ga	Ga	In	1.733	0.591	Cd	Cd	Ge	Zr	Al	Al	Ga	Sc	2.444	0.333	Be	Sr	HF	HF	Al	Ga	Sc	Sc	2.866	0.869	Mg	Mg	Ca	Zn	Si	Si	Sn	Zr	3.384	0.734	
Sr	Sr	Sn	Zr	Al	Al	Al	Y	1.734	0.676	Mg	Ba	Sn	Ti	Al	Al	Al	Ga	2.444	0.289	Ca	Ca	Sr	Cd	Si	Zr	Zr	HF	2.866	0.557	Be	Mg	Sr	Zn	Ti	Ti	HF	HF	3.384	0.494	
Ca	Ba	Sn	HF	Ga	Ga	Ga	In	1.734	0.818	Mg	Ca	Sn	HF	Al	Al	Ga	Ga	2.444	0.183	Ca	Sr	Ti	Zr	Ga	Ga	Sc	Sc	2.866	0.807	Be	Zn	Si	Si	Al	Ga	Ga	Y	3.384	0.581	
Ca	Ca	Ge	Hf	Al	In	In	Y	1.734	0.810	Mg	Ba	Sn	HF	Hf	Ga	Ga	Sc	2.444	0.560	Be	Zn	Ge	Sn	Al	Al	Sc	Sc	2.866	0.951	Mg	Mg	Ge	Ti	Al	Ga	Sc	Sc	3.384	0.574	
Sr	Ba	Ge	Ge	Al	In	Y	Y	1.734	0.689	Sr	Zn	Si	Si	Al	Al	Ga	In	2.444	0.484	Ca	Sr	Ba	Cd	Ge	Ti	Ti	Ti	2.866	0.505	Be	Ca	Zn	Zn	Si	Si	Sn	Zr	3.384	0.786	
Mg	Cd	Ge	Ge	Al	Ga	Ga	In	1.734	0.716	Sr	Zn	Zr	Hf	Al	Al	In	In	2.444	0.256	Be	Be	Sr	Cd	Ge	Si	Ti	Zr	Zr	2.866	0.614	Be	Mg	Cd	Cd	Si	Si	Zr	HF	3.384	0.744
Mg	Sr	Ge	Zr	Ga	Ga	In	In	1.734	0.705	Be	Zn	Ge	Sn	Al	Y	Y	Y	2.444	0.364	Ca	Ca	Ba	Cd	Si	Si	Ge	HF	2.866	0.639	Mg	Ca	Ti	HF	Sc	Sc	Sc	Y	3.384	0.569	
Mg	Ca	Sn	Sn	Sn	Ga	Sc	Y	1.734	0.540	Ba	Ba	Si	Ti	Al	Al	In	Y	2.444	0.357	Be	Mg	Zr	Zr	Al	In	Y	Y	2.866	1.267	Mg	Mg	Zr	HF	Ga	Sc	Sc	Y	3.384	0.633	
Ca	Sr	Sn	HF	In	In	In	Sc	1.734	0.713	Mg	Ba	Ba	Cd	Si	Ge	HF	HF	2.444	0.199	Ca	Cd	Ti	Zr	Ga	Ga	Sc	Sc	2.866	1.150	Mg	Mg	Ti	HF	Al	Ga	Ga	In	3.385	0.587	
Ba	Zn	Si	Si	Al	In	In	Y	1.734	0.667	Ca	Ba	HF	HF	Al	In	Y	Y	2.444	0.655	Mg	Cd	Ge	Ti	Zr	Ga	Ga	Sc	Sc	2.867	0.962	Ca	Ca	Sr	Ba	Si	Sn	Zr	Zr	3.385	0.798
Ba	Zn	Sn	HF	Ga	Ga	Ga	Sc	1.735	0.568	Ca	Ca	Sn	HF	Ga	Sc	Sc	Y	2.445	0.622	Be	Be	Sr	Cd	Si	Ti	Ti	HF	2.867	1.486	Be	Sr	Sr	Ba	Sn	Zr	HF	3.385	0.754		
Mg	Ba	Ge	HF	In	In	Y	Y	1.735	0.981	Mg	Ca	Si	Sn	Al	Al	Y	Y	2.445	0.327	Zn	Cd	HF	HF	Hf	Ga	Sc	Sc	Y	2.867	1.323	Be	Be	Ca	Ba	Si	Ge	Ti	3.385	0.589	
Sr	Ba	Sn	Zr	Ga	Ga	In	In	1.735	0.860	Mg	Ca	Ge	Ge	Al	Ga	Sc	Sc	2.445	0.635	Mg	Mg	Si	Ge	In	Sc	Y	Y	2.867	1.030	Mg	Zn	Si	HF	Al	Al	Al	In	3.385	0.648	
Ba	Ba	Zn	Cd	Si	Sn	Sn	Zr	1.735	0.752	Be	Ba	Ba	Cd	Ge	Ge	Sn	Zr	2.445	0.584	Be	Cd	HF	HF	Ga	Ga	Sc	Y	2.867	0.692	Mg	Ca	Sr	Zn	Si	HF	HF	HF	3.385	0.598	
Zn	Cd	Sn	Ti	Al	Al	In	In	1.735	0.895	Cd	Cd	Ge	Ti	Al	Al	Ga	Y	2.445	0.452	Cd	Cd	Ge	HF	Sc	Sc	Sc	Y	2.867	0.815	Be	Be	Mg	Ba	Si	Si	Ge	HF	3.385	0.541	
Ba	Zn	Sn	HF	Al	Al	Y	Y	1.735	0.824	Mg	Ba	Zr	Zr	Al	In	Y	Y	2.445	0.436	Be	Sr	Cd	Cd	Sn	Zr	HF	HF	2.867	0.821	Mg	Ca	Sr	Zn	Si	Si	HF	HF	3.385	0.394	
Sr	Zn	Si	Ti	In	In	In	Y	1.735	0.715	Cd	Cd	Ti	Zr	Al	Al	In	Y	2.445	0.409	Mg	Sr	Cd	Cd	Sn	Ti	Ti	Zr	2.867	0.723	Mg	Sr	Zn	Zn	Sn	Ti	Ti	HF	3.386	0.248	
Mg	Cd	Ge	HF	Ga	Ga	In	In	1.735	0.874	Be	Be	Si	Sn	Al	In	Y	Y	2.445	0.435	Sr	Cd	Ti	Ti	In	Sc	Sc	Y	2.867	0.905	Mg	Mg	Ba	Zn	Si	Ge	Zr	Zr	3.386	-0.019	
Cd	Cd	Sn	Zr	In	In	Sc	Y	1.736	0.816	Ba	Ba	Si	Zr	Al	Al	Ga	Sc	2.445	0.739	Mg	Sr	Sr	Sr	Zn	Si	Sn	Zr	Zr	2.867	0.885	Mg	Mg	Ca	Ba	Ge	Sn	Sn	Ti	3.386	0.125
Ba	Zn	Sn	Sn	Al	Al	Y	Y	1.736	0.707	Zn	Zn	Si	HF	Al	In	Y	Y	2.445	0.654	Be	Cd	Si	Ti	In	In	Sc	Sc	2.867	1.600	Mg	Mg	Mg	Ba	Sn	Zr	HF	3.386	-0.010		
Be	Ba	Ge	Sn	Al	Al	Al	Ga	1.736	1.109	Be	Ba	Ba	Cd	Ge	Ge	Sn	HF	2.445	0.429	Be	Ba	Ge	Si	Ti	In	Sc	Sc	Sc	2.867	1.545	Mg	Sr	Si	Ti	Sc	Sc	Sc	Y	3.386	0.224
Mg	Sr	Ge	Zr	In	In	In	Sc	1.736	1.027	Ba	Zn	Cd	Cd	Ge	Zr	Zr	HF	2.445	0.502	Mg	Zn	Zr	Zr	In	In	Sc	Y	2.868	1.428	Be	Mg	Ca	Cd	Si	Ti	Ti	Ti	3.387	0.207	
Mg	Sr	Ge	Sn	In	In	Sc	Sc	1.736	0.789	Ba	Ba	Si	Zr	Ga	Ga	Sc	Y	2.445	0.599	Ca	Zn	Sr	Cd	Si	Ti	Ti	HF	2.868	0.814	Be	Ca	Sr	Ba	Sn	Sn	Zn	Zr	3.387	0.078	
Sr	Sr	Sn	Ti	Al	Ga	Ga	In	1.736	1.032	Ba	Ba	Si	Zr	Ga	In	Y	Y	2.445	0.645	Mg	Ca	Zr	Zr	In	Sc	Y	Y	2.868	1.021	Be	Zn	Ge	Ti	Sc	Sc	Y	Y	3.387	0.103	
Sr	Sr	Sn	Zr	Al	Al	Ga	Y	1.736	0.995	Mg	Zn	Si	Sn	Ga	Y	Y	Y	2.445	0.774	Sr	Zn	Zr	Zr	Al	Ga	Sc	Sc	2.868	1.184	Be	Be	Mg	Ba	Ge	Sn	Zr	Zr	3.387	0.367	
Sr	Cd	Si	HF	In	In	Y	Y	1.737	0.744	Zn	Cd	Sn	Ti	In	Y	Y	Y	2.446	0.835	Be	Ba	Si	HF	Al	Al	Al	Ga	2.868	0.860	Be	Ca	Ca	Zn	Si	Si	Sn	HF	3.387	0.116	
Be	Zn	Si	Sn	In	In	Y	Y	1.737	1.012	Be	Mg	Si	Sn	Ga	Ga	Ga	In	2.446	0.755	Mg	Ca	Si	Ge	Al	Al	Y	Y	2.868	1.104	Be	Be	Sr	Ba	Si	Ti	Ti	Zr	3.387	0.367	
Be	Ba	Ge	HF	Ga	G																																			

Sr	Cd	Sn	Sn	Al	Sc	Sc	Y	1.750	0.916	Cd	Cd	Ti	Zr	Al	Al	Ga	In	2.453	0.632	Mg	Ca	Zn	Zn	Si	Sn	Zr	Zr	2.874	0.951	Mg	Ca	Ca	Zn	Si	Sn	Ti	Ti	3.395	0.235	
Zn	Cd	Si	Sn	Ga	Al	Ga	Y	1.750	0.874	Ca	Ca	Zr	Hf	In	In	Sc	Y	2.453	0.468	Zn	Cd	Sn	Zr	Al	Sc	Sc	Sc	2.874	0.929	Mg	Zn	Hf	Hf	Al	Sc	Sc	Y	3.395	0.577	
Ca	Sr	Ge	Sn	Ga	Al	Al	Ga	1.752	0.869	Be	Sr	Ge	Al	Al	Al	Al	Y	2.453	0.388	Be	Ca	Zn	Zn	Si	Sn	Sn	Zr	2.874	0.845	Mg	Zn	Zn	Cd	Ge	Ge	Ti	Hf	3.395	0.354	
Sr	Sr	Ge	Hf	Ga	In	In	Sc	1.752	0.898	Be	Sr	Si	Hf	Ga	Ga	Ga	Y	2.453	0.591	Mg	Sr	Ba	Cd	Si	Si	Ti	Ti	2.874	0.498	Mg	Ca	Zn	Zn	Ge	Sn	Ti	Ti	3.395	0.305	
Be	Ba	Ge	Sn	Al	Al	Y	Y	1.752	0.917	Ba	Cd	Zr	Zr	Al	Al	Ga	In	2.453	0.700	Mg	Sr	Zr	Zr	Al	Al	In	Sc	2.874	0.665	Mg	Zn	Ca	Zn	Al	Sc	Sc	Y	3.395	0.402	
Mg	Sr	Sn	Hf	In	In	Sc	Sc	1.752	0.918	Mg	Mg	Ge	Zr	In	In	Sc	Y	2.453	0.649	Ba	Ba	Ba	Zn	Ge	Sn	Ti	Hf	2.874	0.734	Ca	Sr	Sr	Sn	Sn	Zr	Hf	3.396	0.499		
Sr	Sr	Ge	Sn	Ga	Sc	Sc	Y	1.753	0.902	Ba	Zn	Zn	Cd	Ge	Ti	Ti	Hf	2.453	0.829	Be	Be	Ca	Sr	Si	Sn	Sn	Hf	2.874	0.526	Be	Ca	Sr	Zn	Ge	Ti	Ti	Ti	3.396	0.379	
Mg	Ca	Sn	Hf	Ga	In	In	In	1.753	1.012	Mg	Sr	Si	Hf	Al	Al	In	In	2.453	0.810	Ca	Zn	Sn	Hf	Sc	Y	Y	Y	2.874	0.748	Be	Mg	Sr	Ba	Si	Ge	Ge	Ge	3.396	0.661	
Sr	Ba	Ge	Sn	In	Y	Y	Y	1.753	1.000	Sr	Sr	Zr	Hf	Al	Al	Ga	In	2.453	0.433	Be	Cd	Si	Hf	Al	Al	Y	Y	2.874	0.808	Be	Mg	Sr	Cd	Si	Si	Si	Sc	3.396	0.576	
Sr	Zn	Hf	Hf	Ga	Ga	Ga	Sc	1.753	1.227	Be	Sr	Zr	Zr	In	Sc	Y	Y	2.453	0.480	Be	Mg	Si	Ge	Al	Al	In	In	2.874	0.570	Mg	Mg	Si	Ti	In	Sc	Y	Y	3.396	0.445	
Ca	Ca	Sn	Hf	Ga	In	In	Sc	1.753	0.997	Be	Zn	Si	Hf	Al	In	In	In	2.453	0.398	Be	Sr	Si	Zr	Al	Al	In	In	2.875	0.818	Mg	Zn	Zn	Cd	Si	Si	Zr	Hf	3.396	0.544	
Sr	Zn	Sn	Ti	Ga	Ga	Ga	Y	1.754	0.989	Ca	Ca	Si	Hf	Al	In	Y	Y	2.453	0.426	Mg	Ba	Si	Ti	Ga	Y	Y	Y	2.875	0.970	Ca	Zn	Zr	Hf	Sc	Sc	Sc	Y	3.396	0.405	
Zn	Zn	Ge	Sn	Al	Al	Ga	In	1.754	1.211	Ba	Cd	Hf	Hf	Al	Al	Ga	Y	2.453	0.366	Mg	Mg	Ba	Cd	Sn	Sn	Ti	Zr	2.875	0.571	Be	Ca	Ba	Ba	Ge	Sn	Sn	Ti	3.397	0.375	
Mg	Ba	Si	Si	Ga	In	In	Y	1.754	1.022	Be	Cd	Sn	Hf	Al	Al	Ga	Ga	2.453	0.270	Ca	Ca	Zn	Zn	Ge	Sn	Ti	Zr	2.875	0.894	Mg	Zn	Zn	Ge	Sn	Sn	Ti	Zr	3.397	0.462	
Mg	Ba	Sn	Zr	Zr	Ga	Ga	In	1.754	1.022	Zn	Zn	Zn	Zr	Al	Al	Ga	Y	2.453	0.645	Be	Cd	Hf	Hf	Ga	Ga	Sc	Y	2.875	1.058	Be	Ca	Ba	Si	Zr	Hf	Hf	3.397	0.554		
Cd	Cd	Sn	Zr	Zr	Al	Al	Ga	In	1.754	1.215	Ca	Cd	Zr	Zr	In	In	Sc	Y	2.453	0.562	Mg	Zn	Zn	Cd	Ge	Sn	Zr	Zr	2.875	0.528	Mg	Cd	Ti	Zr	Sc	Sc	Y	Y	3.397	0.473
Ca	Ba	Sn	Zr	In	In	Sc	Sc	1.755	0.766	Be	Zn	Si	Ge	Ga	Ga	Y	Y	2.453	0.349	Ca	Sr	Sr	Cd	Ge	Ti	Ti	Hf	2.875	0.661	Be	Ca	Ba	Zn	Si	Si	Ti	Ti	3.397	0.707	
Be	Cd	Ge	Ge	Al	In	In	Y	1.755	0.760	Mg	Ca	Zr	Hf	In	In	In	Y	2.453	0.416	Zn	Cd	Ti	Ti	Al	Ga	Ga	Y	2.875	0.699	Be	Ba	Zn	Zn	Si	Si	Zr	Hf	3.397	0.624	
Be	Ba	Ge	Sn	Al	Y	Y	Y	1.755	0.739	Ca	Sr	Zn	Zn	Si	Sn	Sn	Ti	2.454	0.450	Mg	Sr	Ti	Ti	Hf	In	Sc	Sc	Sc	2.875	0.963	Zn	Zn	Si	Ti	Ga	Sc	Sc	Y	3.397	0.524
Ca	Cd	Sn	Hf	In	Y	Sc	Sc	1.755	1.033	Mg	Sr	Ge	Hf	Al	Al	Al	In	2.454	0.294	Zn	Cd	Si	Ti	In	Y	Y	Y	2.875	0.861	Ca	Ca	Sr	Ba	Ge	Sn	Sn	Hf	3.397	0.616	
Mg	Sr	Sn	Sn	Al	Sc	Y	Y	1.755	0.959	Be	Sr	Zr	Zr	Al	In	In	Y	2.454	0.681	Mg	Ba	Ba	Cd	Si	Si	Ge	Zr	2.875	0.727	Mg	Cd	Si	Si	Al	Al	Sc	Y	3.397	0.484	
Be	Cd	Sn	Ti	Al	In	In	In	1.756	0.891	Ca	Cd	Si	Sn	Al	Y	Y	Y	2.454	0.715	Mg	Mg	Ge	Zr	Al	Ga	Ga	In	2.875	1.132	Mg	Cd	Si	Si	Al	Sc	Y	Y	3.397	0.450	
Ca	Ba	Sn	Zr	Ga	Ga	In	In	1.756	0.878	Sr	Sr	Ba	Cd	Ge	Ge	Zr	Hf	2.454	0.427	Be	Sr	Ti	Ti	Al	Al	In	Sc	2.875	1.011	Be	Ca	Ca	Zn	Sn	Ti	Zr	Zr	3.397	0.620	
Zn	Zn	Si	Ge	Ga	In	In	Y	1.756	1.053	Sr	Cd	Ge	Zr	In	Y	Y	Y	2.454	0.713	Mg	Ba	Zr	Hf	Al	Al	Al	Y	2.875	0.784	Be	Cd	Ge	Ti	Sc	Sc	Sc	Y	3.397	0.507	
Be	Ba	Ge	Ge	In	Sc	Sc	Y	1.756	0.977	Sr	Sr	Zn	Cd	Sn	Ti	Ti	Hf	2.454	0.672	Zn	Cd	Si	Si	Al	Ga	Ga	Sc	2.875	0.480	Mg	Zn	Si	Ti	Ga	Ga	Sc	Sc	3.397	0.619	
Mg	Cd	Sn	Zr	Ga	Ga	In	In	1.756	0.667	Ba	Ba	Zn	Cd	Si	Si	Ge	Ge	2.454	0.546	Mg	Sr	Hf	Hf	Al	Al	Sc	Y	Y	2.876	0.647	Mg	Zn	Zn	Cd	Ge	Ti	Ti	Hf	3.397	0.683
Ba	Ba	Sn	Hf	Ga	In	Y	Y	1.756	0.983	Ca	Ca	Ba	Cd	Sn	Sn	Zr	Hf	2.454	0.480	Ca	Ca	Sr	Zn	Si	Ge	Ge	Sn	2.876	0.641	Be	Mg	Mg	Zn	Si	Sn	Zr	Zr	3.397	0.519	
Cd	Cd	Si	Sn	Al	Al	In	Sc	1.756	0.908	Ca	Ca	Zn	Zn	Si	Ge	Sn	Hf	2.454	0.513	Be	Ba	Ge	Ti	Sc	Sc	Y	Y	2.876	0.479	Be	Cd	Zr	Hf	Al	Al	Al	Y	3.397	0.493	
Be	Sr	Ge	Ti	In	In	In	In	1.757	0.631	Mg	Ca	Sn	Hf	Al	Al	Y	Y	2.454	0.429	Be	Ca	Sn	Zr	Al	Sc	Sc	Sc	2.876	0.735	Be	Mg	Cd	Cd	Si	Ge	Ti	Ti	3.398	0.528	
Zn	Zn	Si	Sn	In	In	Sc	Y	1.757	0.970	Ba	Ba	Zn	Hf	Hf	Al	Ga	In	2.454	0.757	Sr	Cd	Ti	Ti	Ga	Sc	Y	Y	2.876	0.714	Mg	Mg	Ti	Hf	Al	In	Sc	Sc	3.398	0.410	
Ca	Ba	Si	Sn	Ga	Ga	Y	Y	1.757	0.895	Be	Mg	Zn	Cd	Cd	Ge	Ge	Sn	2.454	0.758	Mg	Mg	Ge	Zr	Ga	In	Sc	Sc	2.876	1.166	Sr	Sr	Sr	Ba	Ge	Ti	Zr	Hf	3.398	0.400	
Mg	Cd	Sn	Sn	Ga	Ga	Y	Y	1.757	1.043	Ca	Cd	Cd	Cd	Ge	Sn	Ti	Zr	2.455	0.530	Mg	Cd	Ti	Zr	In	In	Sc	Sc	2.876	1.138	Ca	Sr	Sr	Ba	Ti	Zr	Hf	3.398	0.759		
Mg	Cd	Ge	Hf	Al	In	In	In	1.757	1.269	Mg	Sr	Hf	Hf	Al	In	Y	Y	2.455	0.546	Sr	Ba	Si	Ti	Al	Al	Al	Ga	2.876	1.034	Be	Be	Mg	Ba	Si	Sn	Zr	Zr	3.398	0.454	
Ca	Sr	Ge	Ge	Al	Ga	Y	Y	1.757	1.044	Ba	Cd	Sn	Zr	Al	Sc	Sc	Sc	2.455	0.692	Be	Cd	Si	Ge	Al	Al	In	In	2.876	0.514	Ca	Cd	Si	Ti	Sc	Sc	Y	Y	3.398	0.452	
Ca	Zn	Ge	Sn	Ga	Ga	Sc	Sc	1.757	0.848	Sr	Zn	Zn	Cd	Cd	Sn	Zr	Hf	Hf	0.726	Mg	Zn	Zn	Cd	Si	Si	Sn	Zr	2.876	0.747	Be	Mg	Sr	Zn	Ti	Hf	Hf	Hf	3.399	0.567	
Ba	Zn	Si	Ti	Ga	In	In	In	1.758	1.202	Ba	Ba	Zn	Cd	Ge	Zr	Zr	Hf	2.455	0.793	Sr	Zn	Si	Si	Ga	Sc	Sc	Y	2.876	0.857	Be	Cd	Si	Zr	Ga	Sc	Sc	Sc	3.399	0.590	
Ba	Cd	Ge	Ti	Ga	Ga	Y	Y	1.758	0.964	Ba	Cd	Si	Ge	Ga	Sc	Sc	Sc	2.455	0.929	Sr	Ba	Ti	Zr	Zr	Al	Al	Y	Y	2.876	0.532	Mg	Zn	Si	Si	Al	Al	Ga	Y	3.399	0.545
Sr	Cd	Sn	Hf	Ga	Ga	Sc	Sc	1.758	0.814	Be	Sr	Zn	Al	Al	Al	Al	Ga	2.455	0.841	Be	Mg	Ge	Zr	In	In	Sc	Sc	2.876	0.828	Be	Be	Ca	Ba	Sn	Ti	Hf	3.399	0.805		
Mg	Ba	Sn	Ti	Ga	Ga	Ga	In	1.758	1.189	Be	Cd	Ge	Ge	In	Sc	Sc	Y	2.455	0.640	Ca	Zn	Ti	Hf	Al	Ga	Ga	Ga	2.876	0.914	Be	Be	Sr	Ba	Sn	Ti	Hf	Hf	3.399	0.648	
Mg	Ba	Ge	Ge	Al	In	Sc	Sc	1.758	0.950	Ca	Cd	Sn	Zr	Al	Al	Al	Sc	2.455	0.699	Ca	Sr	Sr	Cd	Si	Si	Ge	Zr	2.876	0.581	Ca	Zn	Zr	Hf	Al	Al	Al	Ga	3.399	0.593	
Sr	Zn	Zn	Cd	Si	Sn	Sn	Zr	1.758	0.902	Ba	Zn	Zn	Zn	Si	Sn	Ti	Zr	2.455	0.619	Mg	Cd	Ge	Ti	In	Y	Y	Y	2.876	0.904	Mg	Sr	Zn	Zn	Sn	Ti	Ti	Zr	3.400	0.771	
Ca	Ca	Si	Sn	Ga	In	In	Sc	1.758	0.953	Ca	Cd	Si	Si	Ga	Ga	Sc	Y	2.455	0.439	Ca	Ba	Zn	Zn	Si	Si	Ti	Zr	2.877	1.114	Be	Mg	Ti	Ti	In	In	Sc	Sc	3.400	0.627	
Mg	Ca	Sn	Hf	In	In	In	Sc	1.758	0.680	Be	Ba	Zr	Zr	In	Sc	Sc	Y	2.455	0.384	Ca	Ba	Ti	Zr	Al	Al	Y	Y	2.877	0.572	Be	Mg	Ti	Hf	Sc	Y	Y	Y	3.400	0.598	
Be	Ca	Si	Ge	In	In	Y	Y	1.758	0.876	Ba	Ba	Ba	Cd	Ge	Sn	Ti	Hf	2.455	0.296	Zn	Cd	Ti	Hf	Al	Y	Y	Y	2.877	0.979	Mg	Sr	Sr	Zn	Ge	Ti	Ti	Zr	3.400	0.587	
Sr	Zn	Si	Hf	In	In	Y	Y	1.758	0.936	Be	Cd	Si	Ge	Ga	Ga	Ga	Y	2.455	0.653	Mg	Zn	Sn	Ti	Ga	Ga	Sc	Sc	2.877	1.186	Ca	Ca	Sr	Ba	Si	Sn	Sn	Hf	3.400	0.606	
Cd	Cd	Ge	Hf	Ga	Ga	In																																		

Ca	Sr	Sn	Hf	Ga	Ga	In	1.772	0.486	Cd	Cd	Sn	Ti	Ga	Sc	Y	Y	2.462	0.923	Ca	Cd	Si	Zr	Al	Al	Al	Y	2.883	0.636	Mg	Ca	Ca	Zn	Si	Si	Sn	Hf	3.410	0.881		
Mg	Ba	Ge	Sn	Ga	Sc	Sc	1.772	0.544	Ba	Cd	Ge	Ti	In	Y	Y	Y	2.462	0.683	Mg	Zn	Cd	Cd	Si	Sn	Zr	Zr	2.883	0.630	Zn	Cd	Ca	Zn	Ge	Hf	Hf	Hf	3.410	1.292		
Cd	Ge	Ti	In	In	In	Sc	1.772	0.755	Ba	Ba	Zr	Hf	Al	Ga	Ga	In	2.462	0.770	Mg	Zn	Cd	Cd	Si	Sn	Hf	Zr	2.883	0.529	Be	Mg	Ti	Al	Al	Sc	Sc	3.410	0.994			
Ba	Ba	Ge	Hf	Ga	Ga	In	Y	1.772	0.472	Be	Sr	Zr	Zr	Al	Ga	In	In	2.462	0.686	Be	Mg	Ti	Hf	In	Y	Y	Y	2.883	0.687	Be	Be	Si	Hf	In	Sc	Sc	Y	3.410	0.606	
Be	Sr	Ge	Ti	In	In	In	Sc	1.772	0.542	Zn	Zn	Ti	Hf	Ga	Ga	In	Y	2.462	0.575	Zn	Zn	Si	Hf	In	Sc	Y	Y	2.883	0.843	Be	Be	Mg	Zn	Si	Sc	Ge	Hf	3.411	0.656	
Ca	Zn	Ge	Zr	In	In	Ga	In	Sc	1.773	0.748	Sr	Cd	Hf	Hf	Ga	Ga	Sc	Y	2.462	0.509	Mg	Ca	Sr	Cd	Sn	Hf	Hf	Hf	2.884	0.557	Be	Ca	Zn	Zn	Sn	Ti	Zr	Zr	3.411	0.604
Ca	Cd	Sn	Ti	Ga	Ga	In	In	1.773	0.588	Sr	Cd	Zr	Hf	Hf	Ga	Ga	In	Y	2.463	0.427	Be	Ca	Si	Si	Al	Ga	Ga	Y	2.884	0.750	Mg	Zn	Ti	Ti	Al	In	Sc	Sc	3.411	0.950
Be	Ba	Ge	Ge	Al	Al	In	Sc	1.773	0.598	Ca	Sr	Sr	Cd	Ge	Sn	Sn	Hf	2.463	0.774	Mg	Ca	Si	Ti	Zr	Al	Al	In	In	2.884	0.880	Ca	Ca	Sr	Ba	Si	Sn	Zr	Zr	3.411	1.339
Ca	Cd	Si	Hf	Ga	Ga	In	In	1.773	0.711	Ba	Zn	Si	Ti	Ga	Ga	Sc	Sc	2.463	0.702	Sr	Zn	Si	Ti	Zr	Al	Al	Al	Sc	2.884	0.487	Be	Be	Mg	Ba	Si	Si	Ge	Zr	3.411	1.184
Sr	Zn	Si	Hf	In	In	In	Sc	1.773	0.370	Ca	Zn	Sn	Ti	Al	Al	Ga	Ga	2.463	0.501	Zn	Zn	Si	Ti	Al	Al	In	Y	2.884	0.585	Mg	Ca	Zn	Zn	Sn	Zr	Hf	Hf	3.411	0.774	
Ba	Zn	Si	Hf	Ga	Ga	In	In	1.773	0.375	Sr	Ba	Cd	Cd	Ge	Zr	Hf	Hf	2.463	0.547	Mg	Ca	Ba	Ba	Zn	Sn	Hf	Hf	2.884	0.589	Be	Zn	Si	Zr	Al	Al	Ga	Ga	3.412	1.402	
Sr	Sr	Cd	Cd	Si	Ge	Sn	Hf	1.773	0.280	Ca	Ba	Cd	Ti	Hf	Ga	Ga	In	2.463	0.626	Ca	Ba	Hf	Hf	Al	Sc	Y	Y	2.884	0.757	Be	Be	Ge	Ti	Al	Sc	Y	Y	3.412	1.230	
Be	Cd	Sn	Hf	In	In	Y	Y	1.774	0.519	Be	Ba	Ti	Ti	In	Sc	Y	Y	2.463	0.453	Be	Ba	Si	Hf	Al	Al	Sc	Sc	2.884	0.727	Be	Zn	Si	Si	Al	In	Sc	Sc	3.412	0.765	
Sr	Cd	Ge	Ti	Al	Al	Al	In	1.774	0.544	Ca	Zn	Si	Sn	In	Sc	Sc	Sc	2.463	0.776	Mg	Sr	Hf	Hf	Al	Al	Ga	Ga	Sc	2.884	0.627	Be	Mg	Mg	Cd	Si	Si	Sn	Ti	3.412	0.818
Sr	Ba	Cd	Cd	Si	Sn	Zr	Zr	1.774	0.411	Sr	Cd	Ti	Zr	Al	Ga	Ga	Ga	2.463	0.884	Zn	Zn	Si	Zr	Al	Ga	Ga	Y	2.884	0.891	Ca	Ca	Sr	Zn	Si	Ti	Ti	Hf	3.412	0.860	
Mg	Sr	Ba	Cd	Ge	Sn	Sn	Sn	1.774	0.551	Ca	Sr	Zn	Zn	Ge	Ge	Sn	Hf	2.463	0.577	Ca	Zn	Cd	Cd	Ge	Ti	Ti	Zr	2.884	0.848	Be	Ba	Mg	Cd	Si	Ge	Ge	Ti	3.412	0.826	
Sr	Zn	Ge	Zr	Ga	Ga	Ga	Y	1.774	0.571	Sr	Cd	Hf	Hf	Al	Al	Ga	In	2.463	0.824	Mg	Sr	Cd	Cd	Si	Si	Ti	Zr	2.884	0.639	Be	Be	Mg	Zn	Ge	Ti	Hf	Hf	3.412	0.897	
Be	Sr	Sn	Zr	In	In	Sc	Sc	1.774	0.427	Zn	Cd	Ge	Ge	Al	Al	Sc	Y	2.463	0.801	Mg	Ba	Zr	Zr	Al	Ga	Sc	Sc	2.884	0.525	Mg	Sr	Zn	Zn	Si	Si	Ti	Hf	3.412	1.153	
Ba	Ba	Zn	Cd	Si	Sn	Zr	Zr	1.774	0.449	Be	Sr	Sn	Hf	Sc	Sc	Sc	Y	2.464	0.671	Zn	Cd	Si	Hf	Al	Al	Al	In	2.884	0.608	Mg	Zn	Hf	Hf	Al	Ga	Ga	Sc	3.413	1.701	
Be	Cd	Ge	Ge	Ga	Ga	In	Sc	1.774	0.542	Be	Mg	Cd	Cd	Si	Sn	Sn	Hf	2.464	0.593	Be	Cd	Ti	Ti	Ga	Sc	Y	Y	2.884	0.551	Be	Ca	Zn	Cd	Ti	Ti	Ti	Hf	3.413	1.651	
Ca	Ba	Sn	Ti	Ga	Ga	In	In	1.774	0.397	Sr	Ba	Si	Hf	Al	Al	Al	Y	2.464	0.677	Mg	Mg	Ba	Zn	Ge	Sn	Zr	Sc	2.884	0.555	Be	Be	Ca	Ba	Sn	Ti	Zr	Zr	3.413	1.503	
Be	Ba	Sn	Hf	Ga	Ga	Ga	Y	1.775	0.431	Mg	Sr	Si	Ge	Al	Al	Al	Y	2.464	0.562	Be	Ba	Ti	Ti	Al	Ga	Sc	Sc	2.884	0.682	Be	Zn	Cd	Cd	Si	Zr	Zr	Hf	3.413	1.145	
Cd	Cd	Ge	Hf	Ga	Ga	In	In	1.776	0.537	Ca	Zn	Zr	Zr	Al	In	In	Y	2.464	0.834	Ca	Sr	Sr	Zn	Ge	Sn	Sn	Hf	2.884	0.590	Ca	Ca	Ca	Ba	Si	Sn	Zr	Hf	3.413	1.452	
Ca	Sr	Sn	Zr	Ga	Ga	Ga	In	1.776	0.392	Be	Ba	Si	Ge	Al	Al	Y	Y	2.464	0.915	Sr	Sr	Ba	Zn	Ge	Ge	Zr	Hf	2.884	0.882	Mg	Ba	Zn	Zn	Si	Si	Ge	Ti	3.413	1.312	
Ba	Ba	Zn	Cd	Ge	Sn	Zr	Zr	1.776	0.779	Be	Zn	Ge	Zr	In	In	In	Sc	2.464	0.655	Mg	Mg	Ti	Hf	Al	In	In	Y	2.884	0.856	Mg	Cd	Zr	Hf	Sc	Sc	Sc	Y	3.413	1.185	
Sr	Ba	Sn	Zr	Ga	Ga	Ga	Sc	1.776	0.748	Ba	Zn	Zr	Zr	Ga	Ga	In	Sc	2.464	0.641	Be	Mg	Ge	Hf	Ga	Y	Y	Y	2.884	0.739	Mg	Cd	Ge	Ti	Sc	Y	Y	Y	3.413	1.493	
Sr	Ba	Cd	Cd	Ge	Sn	Zr	Zr	1.776	0.389	Sr	Sr	Zr	Hf	Al	Ga	Ga	Y	2.464	0.819	Ca	Zn	Cd	Cd	Si	Zr	Zr	Hf	2.884	0.516	Be	Mg	Zn	Cd	Si	Si	Hf	Hf	3.414	1.357	
Sr	Zn	Ge	Hf	In	In	In	Sc	1.776	0.699	Ca	Sr	Cd	Cd	Sn	Ti	Zr	Zr	2.464	0.827	Be	Be	Be	Zn	Si	Ge	Sn	Hf	2.884	0.579	Be	Zn	Si	Zr	Sc	Sc	Y	Y	3.414	1.260	
Sr	Sr	Ge	Zr	Al	In	In	Sc	1.776	0.729	Mg	Ba	Ge	Hf	In	In	Sc	Sc	2.464	0.853	Mg	Sr	Ba	Cd	Ti	Zr	Zr	Zr	2.884	0.615	Ca	Zn	Ti	Zr	Ga	Sc	Sc	Sc	3.414	1.593	
Ba	Zn	Cd	Cd	Ge	Ge	Sn	Zr	1.777	0.354	Ca	Sr	Sr	Cd	Si	Si	Ge	Sn	2.464	1.049	Ba	Cd	Ti	Zr	Al	Al	Al	Sc	2.885	0.566	Ba	Zn	Zn	Cd	Ti	Zr	Hf	Hf	3.414	1.338	
Be	Ba	Si	Hf	In	In	In	Y	1.777	0.683	Sr	Zn	Si	Ti	Al	Ga	Ga	Ga	2.465	0.933	Ba	Cd	Ti	Ti	Ga	Sc	Sc	Y	2.885	0.646	Mg	Zn	Cd	Cd	Si	Ti	Ti	Hf	3.414	1.317	
Sr	Sr	Sn	Hf	Al	Al	Ga	In	1.777	0.725	Sr	Cd	Zr	Zr	Al	Ga	Ga	Y	2.465	0.717	Mg	Sr	Si	Zr	Ga	Y	Y	Y	2.885	0.639	Mg	Ca	Sr	Sr	Sn	Zr	Zr	Hf	3.414	1.650	
Sr	Sr	Ge	Zr	In	In	Sc	Y	1.777	0.348	Sr	Ba	Cd	Cd	Ge	Sn	Ti	Zr	2.465	0.805	Ba	Ba	Ba	Zn	Ge	Sn	Ti	Zr	2.885	0.543	Be	Mg	Sn	Zn	Ti	Ti	Zr	Zr	3.414	1.382	
Ca	Ba	Ge	Ge	Al	In	Sc	Sc	1.777	0.493	Ba	Ba	Cd	Cd	Ge	Ge	Sn	Ti	2.465	0.722	Mg	Ba	Si	Ti	Al	Al	Al	In	2.885	0.696	Be	Cd	Si	Hf	In	Sc	Sc	Sc	3.414	1.027	
Zn	Cd	Sn	Hf	Ga	Ga	Ga	In	1.777	0.522	Mg	Ba	Ba	Cd	Ge	Ge	Zr	Hf	2.465	0.432	Ca	Ca	Ti	Hf	In	Sc	Sc	Y	2.885	0.846	Zn	Cd	Si	Ti	Al	Al	Al	Y	3.414	1.071	
Ba	Zn	Ge	Hf	Ga	Ga	Ga	Sc	1.777	0.309	Mg	Ba	Ba	Cd	Si	Ge	Zr	Zr	2.465	0.395	Be	Sr	Zn	Zn	Si	Sn	Zr	Zr	2.885	0.568	Be	Zn	Zn	Cd	Si	Ge	Ge	Ti	3.414	1.067	
Sr	Sr	Sn	Zr	Ga	Ga	Ga	In	Sc	1.777	0.481	Sr	Ba	Ge	Hf	In	In	Sc	Sc	2.465	0.286	Ca	Ca	Ge	Hf	Al	Al	Sc	Y	2.885	0.757	Mg	Sr	Zn	Zn	Si	Si	Ti	Zr	3.414	1.376
Be	Ca	Sr	Cd	Si	Sn	Sn	Sn	1.777	0.516	Zn	Cd	Hf	Hf	Al	In	In	Sc	2.465	0.634	Be	Zn	Ge	Ge	Al	Al	Ga	Y	2.885	0.884	Mg	Zn	Si	Ge	Al	Al	Al	Ga	3.414	1.692	
Ba	Zn	Ge	Ti	Ga	Ga	Ga	Y	1.778	0.298	Ca	Ba	Cd	Cd	Si	Si	Ge	Ti	2.465	0.584	Be	Ba	Ti	Hf	Al	Al	Al	Y	2.885	0.506	Ca	Sr	Sr	Ba	Ge	Ge	Zr	Hf	3.414	1.560	
Sr	Ba	Ge	Ti	Ga	In	In	In	1.778	0.604	Mg	Ca	Sn	Zr	In	Y	Y	Y	2.465	0.331	Mg	Cd	Sn	Hf	Al	Al	Al	Sc	2.885	0.606	Be	Zn	Ti	Zr	In	Sc	Sc	Sc	3.415	1.426	
Sr	Cd	Cd	Cd	Si	Ge	Sn	Hf	1.778	0.608	Sr	Zn	Si	Si	Al	Ga	Ga	Sc	2.465	0.448	Mg	Ba	Si	Hf	Al	Al	Al	Sc	2.885	0.611	Mg	Ca	Zn	Zn	Ge	Ti	Zr	Zr	3.415	1.747	
Be	Ca	Ge	Ge	Al	In	In	Sc	1.778	0.264	Ba	Zn	Cd	Cd	Si	Ti	Ti	Zr	2.465	0.459	Zn	Zn	Ti	Zr	In	Sc	Y	Y	2.885	0.791	Be	Ca	Si	Si	Al	Al	Sc	Y	3.415	1.597	
Ca	Ba	Ge	Zr	Ga	Ga	In	In	1.778	0.906	Be	Ba	Ge	Zr	Al	Al	Al	Y	2.465	0.265	Be	Mg	Sr	Sr	Si	Si	Ge	Sn	Sn	2.885	0.774	Be	Ca	Zn	Zn	Sn	Zr	Hf	Hf	3.415	1.173
Mg	Ba	Sn	Ti	Ga	Ga	Ga	Y	1.778	0.861	Cd	Cd	Hf	Hf	Al	In	Sc	Y	2.465	0.713	Mg	Ba	Ba	Zn	Si	Sn	Ti	Ti	2.885	0.670	Be	Be	Mg	Sr	Ge	Sn	Hf	Hf	3.415	1.220	
Zn	Zn	Sn	Zr	Al	Ga	Ga	In	1.779	0.646	Ca	Ba	Ti	Ti	Al	Ga	In	In	2.465	0.708	Ca	Sr	Cd	Cd	Ge	Ti	Ti	Zr	2.885	0.917	Be	Be	Mg	Ca	Ge	Sn	Sn	Hf	3.415	1.299	
Sr	Ba	Z																																						

Ba	Cd	Si	Ti	In	In	Y	Y	1.798	0.618	Mg	Zn	Sn	Zr	Ga	Ga	Ga	Y	2.472	1.314	Sr	Ba	Zr	Hf	Sc	Sc	Sc	Y	2.890	1.195	Mg	Mg	Mg	Ba	Si	Sn	Zr	Hf	3.424	0.980	
Sr	Cd	Si	Ti	In	In	Y	Y	1.798	0.560	Zn	Zn	Sn	Ti	Ga	Ga	Ga	Sc	Y	2.472	1.057	Mg	Cd	Ti	Hf	In	Y	Y	Y	2.890	0.506	Mg	Ca	Si	Ti	Al	Y	Y	Y	3.425	0.889
Ca	Sr	Si	Ge	In	In	Sc	Sc	1.798	0.535	Be	Sr	Sr	Cd	Ge	Sn	Ti	Ti	2.472	0.752	Mg	Ge	Sn	Sn	Ti	Ga	Ga	In	2.890	0.522	Be	Mg	Sr	Hf	Ga	Ga	In	3.425	1.038		
Be	Cd	Sn	Sn	Al	In	Sc	Sc	1.798	0.525	Ca	Zn	Ti	Zr	Ga	Ga	In	In	2.472	0.441	Be	Mg	Zr	Hf	Ga	In	In	In	2.891	0.693	Be	Zn	Zn	Zn	Ge	Sn	Ti	Hf	3.425	1.021	
Sr	Sr	Zn	Cd	Sn	Sn	Zr	Hf	1.798	0.378	Be	Sr	Ti	Zr	Hf	Ga	Y	Y	2.472	0.379	Mg	Ca	Ti	Hf	Ga	Ga	Y	Y	2.891	0.808	Be	Ba	Zn	Cd	Si	Si	Ti	3.425	0.911		
Be	Sr	Sn	Hf	Ga	Ga	Ga	In	1.798	0.495	Mg	Zn	Si	Hf	Ga	Ga	In	In	2.472	0.545	Zn	Zn	Ge	Ti	Al	Al	Ga	Y	2.891	0.776	Be	Ca	Ti	Ti	Al	Al	Ga	Sc	3.425	1.034	
Ca	Zn	Ge	Ge	Al	Ga	Ga	Y	1.798	0.553	Ca	Zn	Zr	Zr	Zr	Ga	In	Y	2.472	0.567	Mg	Sr	Ti	Ti	Al	Al	Ga	Sc	2.891	0.764	Mg	Ca	Si	Zr	Al	Al	Al	Ga	3.425	0.985	
Ca	Ca	Ge	Zr	In	In	In	Y	1.798	0.425	Ba	Ba	Si	Zr	Al	Al	In	Sc	2.472	0.424	Be	Be	Ba	Cd	Ge	Sn	Ti	Ti	2.891	0.878	Be	Ca	Zn	Cd	Ti	Ti	Zr	3.425	0.860		
Sr	Zn	Ge	Sn	In	Y	Y	Y	1.799	0.581	Sr	Sr	Si	Si	Al	Ga	Sc	Y	2.472	0.613	Sr	Ba	Zn	Zn	Ge	Ti	Ti	Hf	2.891	0.740	Be	Mg	Ti	Ti	In	Sc	Sc	Y	3.425	1.028	
Ca	Ca	Ge	Zr	Al	In	In	Y	1.799	0.578	Ba	Cd	Ti	Hf	Ga	Ga	Sc	Sc	2.472	1.446	Be	Be	Sn	Ti	Ga	Ga	In	Y	2.891	0.783	Mg	Ca	Ti	Zr	Sc	Sc	Y	Y	3.426	0.995	
Sr	Cd	Sn	Al	Ga	Ga	Ga	Sc	1.799	0.444	Ca	Ba	Ti	Ti	Ga	In	Y	Y	2.472	1.310	Mg	Ca	Ba	Cd	Ge	Ge	Ti	Ti	2.891	0.546	Ca	Ca	Si	Ti	Al	Sc	Y	Y	3.426	1.020	
Mg	Ca	Si	Ge	In	In	Y	Y	1.799	0.474	Mg	Zn	Ge	Ge	Hf	Ga	Ga	In	2.473	1.264	Ca	Cd	Si	Hf	Al	Al	Al	Ga	2.891	0.508	Mg	Sr	Ba	Zn	Zr	Zr	Hf	Hf	3.426	1.241	
Ca	Sr	Ge	Zr	Ga	In	In	In	1.799	0.553	Ba	Cd	Si	Zr	Al	Al	Al	Y	2.473	0.615	Ca	Zn	Ge	Ti	Ga	Y	Y	Y	2.891	0.675	Mg	Ca	Zr	Zr	Al	Al	Sc	Sc	3.426	1.218	
Sr	Ba	Si	Si	Ga	In	In	Y	1.799	0.420	Mg	Zn	Zn	Cd	Ge	Ge	Sn	Zr	2.473	0.631	Mg	Sr	Sr	Cd	Ti	Zr	Zr	Hf	2.891	0.900	Mg	Mg	Ti	Hf	Al	Sc	Y	Y	3.427	1.089	
Mg	Ca	Si	Ge	Ga	Sn	In	Zr	1.800	0.455	Ca	Sr	Zn	Cd	Ge	Ge	Ge	Ti	2.473	1.015	Mg	Mg	Zr	Hf	Ga	In	In	Y	2.891	0.440	Be	Cd	Ti	Hf	Al	Al	Al	Ga	3.427	0.560	
Sr	Zn	Zn	Cd	Ge	Sn	Sn	Zr	1.800	0.549	Mg	Mg	Sr	Cd	Si	Sn	Sn	Hf	2.473	0.765	Mg	Mg	Sr	Zn	Si	Sn	Sn	Zr	2.891	0.712	Be	Mg	Sr	Si	Sn	Hf	Hf	3.427	1.003		
Sr	Sr	Sn	Zr	Ga	In	Y	Y	1.800	0.416	Sr	Ba	Zr	Zr	Zr	Al	Ga	In	2.473	0.671	Zn	Cd	Zr	Zr	Zr	Al	Al	Ga	Y	2.891	0.822	Be	Cd	Ti	Zr	Al	Sc	Sc	Sc	3.427	0.883
Mg	Cd	Sn	Hf	In	In	In	Sc	1.800	0.831	Sr	Zn	Cd	Cd	Si	Ti	Hf	Hf	2.473	1.057	Be	Zn	Zr	Hf	Al	Al	Y	Y	2.891	0.705	Mg	Mg	Ti	Hf	Al	In	In	Sc	3.427	0.561	
Sr	Cd	Ge	Ti	Ga	Ga	Ga	Y	1.801	0.745	Zn	Cd	Ge	Sn	Al	Sc	Sc	Sc	2.473	0.926	Mg	Mg	Ti	Hf	In	In	Sc	Y	2.891	0.750	Be	Zn	Zr	Zr	Al	Ga	Sc	Sc	3.427	1.039	
Sr	Sr	Cd	Cd	Si	Sn	Zr	Hf	1.801	0.365	Ca	Cd	Ge	Ge	Al	Sc	Y	Y	2.473	0.091	Ca	Sr	Si	Ti	Al	Al	Al	In	2.892	0.525	Mg	Sr	Ba	Ba	Sn	Sn	Ti	Hf	3.427	0.924	
Mg	Ca	Ge	Zr	In	In	In	Y	1.801	0.739	Zn	Zn	Si	Ge	Ga	Ga	Sc	Y	2.473	1.331	Mg	Ca	Si	Zr	Zr	Ga	Ga	Sc	2.892	0.476	Mg	Sr	Zn	Zn	Si	Si	Ti	Zr	3.427	0.716	
Mg	Sr	Si	Sn	Al	Al	Ga	Ga	1.801	0.726	Ba	Cd	Si	Si	Al	Al	Ga	Sc	2.473	0.821	Ca	Sr	Ti	Zr	Zr	Al	Al	Al	In	2.892	0.625	Be	Be	Zn	Zn	Si	Ti	Zr	Hf	3.428	1.156
Ba	Cd	Sn	Hf	Ga	In	In	Sc	1.801	0.334	Sr	Ba	Cd	Zr	Zr	Al	Ga	Ga	Y	2.473	0.957	Be	Cd	Si	Sn	Al	Al	Al	Y	2.892	0.520	Ca	Ca	Ca	Sr	Ge	Sn	Zr	Hf	3.428	0.882
Mg	Cd	Ge	Hf	In	In	In	Y	1.801	0.720	Ba	Cd	Ti	Hf	Al	Al	Ga	Ga	2.473	1.389	Be	Ca	Ba	Cd	Ti	Hf	Hf	Hf	2.892	0.423	Be	Ca	Ba	Ba	Si	Sn	Sn	Ti	3.428	0.730	
Ca	Sr	Ge	Sn	In	In	Sc	Sc	1.802	0.722	Sr	Zn	Si	Hf	Al	Al	Ga	Ga	2.473	0.435	Mg	Ba	Si	Hf	Al	Al	Al	Ga	2.892	0.664	Be	Zn	Ge	Hf	Al	Al	Al	Ga	3.428	1.209	
Ba	Ba	Cd	Cd	Si	Ge	Zr	Hf	1.802	0.329	Ca	Ba	Sn	Zr	Ga	Y	Y	Y	2.473	0.417	Mg	Sr	Si	Ge	Sc	Sc	Al	Y	2.892	0.538	Be	Ge	Sr	Ti	Ti	Zr	Hf	3.428	0.922		
Sr	Cd	Cd	Si	Ge	Sn	Zr	Hf	1.802	0.567	Ba	Zn	Zn	Zn	Ge	Sn	Ti	Zr	2.473	0.491	Sr	Sr	Ba	Zn	Ge	Ge	Sn	Hf	2.892	0.659	Mg	Ca	Sr	Zn	Ge	Ge	Ti	Ti	3.428	0.525	
Sr	Sr	Ge	Sn	In	Sc	Y	Y	1.802	0.621	Be	Cd	Si	Zr	In	In	In	Sc	2.473	1.251	Mg	Sr	Si	Zr	In	Al	Al	In	2.892	0.768	Be	Be	Ca	Ba	Sn	Sn	Zr	Hf	3.428	0.604	
Ba	Ba	Cd	Cd	Si	Sn	Sn	Ti	1.802	0.353	Sr	Zn	Zr	Zr	Al	Ga	Y	Y	2.473	1.137	Be	Ba	Zn	Zn	Cd	Sn	Ti	Ti	2.892	0.515	Mg	Sr	Sr	Zn	Ti	Zr	Hf	Hf	3.428	0.497	
Zn	Zn	Sn	Hf	Ga	In	In	Y	1.802	0.551	Sr	Zn	Cd	Cd	Sn	Ti	Ti	Hf	2.474	0.895	Ca	Ca	Ba	Cd	Cd	Si	Ti	Ti	Hf	2.892	0.604	Be	Mg	Ti	Hf	Ga	Ga	In	3.428	0.821	
Sr	Zn	Si	Sn	Ga	Ga	Sc	Sc	1.802	0.616	Ca	Sr	Si	Si	Al	Al	In	Y	2.474	1.456	Ca	Ba	Si	Hf	Ga	Y	Y	Y	2.892	0.826	Ca	Zn	Si	Ti	Al	Al	Sc	3.428	1.243		
Be	Ca	Sn	Sn	Al	Ga	Sc	Sc	1.802	0.342	Mg	Ba	Cd	Cd	Ge	Ge	Ti	Hf	2.474	1.230	Zn	Zn	Zr	Zr	Ga	Ga	In	Sc	2.892	0.419	Ca	Ca	Sr	Zn	Si	Ti	Ti	Zr	3.429	1.071	
Be	Ba	Ge	Hf	In	In	In	Sc	1.802	0.674	Mg	Ca	Cd	Si	Ge	Al	Ga	Ga	2.474	0.954	Mg	Ca	Cd	Cd	Cd	Si	Si	Zr	Hf	2.892	0.446	Be	Be	Mg	Ca	Ge	Sn	Sn	Ti	3.429	0.833
Ca	Cd	Ge	Hf	Ga	Ga	Ga	In	1.802	0.684	Ca	Zn	Zn	Si	Si	Ge	Sn	Hf	2.474	0.695	Mg	Mg	Si	Sn	Al	Ga	Sc	Sc	2.892	0.593	Be	Mg	Mg	Cd	Sn	Ti	Ti	Zr	3.429	1.294	
Ca	Sr	Sn	Ti	Ga	In	In	In	1.802	0.300	Be	Be	Zn	Cd	Si	Ge	Sn	Sn	2.474	0.632	Be	Sr	Cd	Cd	Ge	Ti	Zr	Zr	2.892	0.835	Sr	Ba	Ba	Cd	Si	Ti	Zr	Hf	3.429	1.105	
Mg	Ca	Si	Sn	Al	Al	In	In	1.802	0.964	Ca	Ba	Hf	Hf	Al	Ga	In	In	2.474	0.779	Mg	Sr	Cd	Cd	Ge	Zr	Hf	Hf	2.892	0.821	Mg	Cd	Si	Hf	Ga	Sc	Sc	Sc	3.430	0.666	
Ba	Ba	Sn	Ti	Al	Al	Ga	Y	1.803	0.873	Ca	Sr	Cd	Cd	Ge	Ti	Hf	Hf	2.474	0.811	Mg	Ca	Sn	Hf	Sc	Y	Y	Y	2.892	0.853	Mg	Ca	Zn	Zn	Si	Si	Sn	Zr	3.430	0.747	
Be	Ca	Sn	Ti	Ga	In	In	In	1.803	0.628	Be	Sr	Sn	Hf	Sc	Y	Y	Y	2.474	0.675	Ca	Ba	Ba	Zn	Ge	Sn	Sn	Hf	2.893	0.893	Mg	Sr	Sr	Ba	Ge	Sn	Hf	Hf	3.430	0.700	
Sr	Ba	Si	Sn	Ga	Ga	Sc	Sc	1.803	0.862	Sr	Zn	Ti	Zr	Ga	Ga	Ga	Y	2.474	0.845	Mg	Ba	Ba	Zn	Cd	Sn	Ti	Ti	Ti	2.893	0.784	Be	Mg	Ti	Ti	Ga	Ga	Sc	Y	3.430	0.727
Be	Sr	Ge	Sn	Ga	Sc	Sc	Sc	1.803	0.857	Ca	Cd	Si	Si	Al	Ga	Y	Y	2.474	1.586	Ca	Ba	Ba	Cd	Si	Si	Ge	Ti	2.893	0.869	Ca	Sr	Ba	Ba	Ge	Zr	Hf	Hf	3.430	0.826	
Ca	Ca	Si	Sn	Ga	Ga	Sc	Y	1.803	0.598	Be	Sr	Ti	Hf	Al	Al	In	In	2.474	1.459	Mg	Cd	Si	Ge	In	Sc	Sc	Sc	2.893	0.710	Be	Zn	Si	Sn	Al	Al	Al	Sc	3.430	1.009	
Mg	Ba	Sn	Zr	Al	Al	In	In	1.804	0.842	Be	Sr	Ti	Hf	Ga	Ga	Y	Y	2.474	1.413	Ca	Ba	Zr	Hf	Ga	Sc	Sc	Sc	2.893	0.679	Mg	Zn	Cd	Cd	Si	Si	Ti	Hf	3.431	1.598	
Mg	Mg	Ge	Sn	Al	Al	In	In	1.804	0.854	Ca	Ba	Si	Zr	Zr	Al	Ga	Ga	2.474	0.865	Ba	Cd	Zr	Hf	Al	Al	Al	Sc	2.893	0.810	Be	Mg	Zn	Cd	Ge	Ge	Ti	Ti	3.431	1.583	
Be	Zn	Sn	Ga	Ga	Ga	In	Sc	1.804	0.593	Be	Ba	Si	Hf	Ga	Ga	Ga	Sc	2.474	0.856	Be	Cd	Si	Hf	Al	Ga	Ga	Ga	2.893	0.663	Be	Mg	Ge	Hf	Al	Al	Sc	Sc	3.431	1.435	
Sr	Sr	Cd	Cd	Ge	Sn	Zr	Hf	1.804	0.675	Ca	Ca	Si	Zr	Zr	Al	Ga	In	2.474	1.194	Mg	Mg	Sr	Cd	Cd	Ge	Ga	Sn	Ti	2.893	0.623	Mg	Zn	Zn	Cd	Cd	Si	Ge	Ti	3.431	0.898
Ba	Zn	Si	Ti																																					

Be	Ba	Si	Ge	Ga	Ga	Sc	1.817	0.825	Sr	Zn	Cd	Cd	Sn	Zr	Zr	Hf	2.480	0.798	Sr	Cd	Ge	Te	Sc	Sc	Sc	Y	2.898	1.029	Mg	Mg	Si	Ge	Al	Sc	Sc	Y	3.440	0.918		
Be	Ba	Si	Sn	Al	Al	Al	1.818	0.770	Sr	Cd	Sn	Zr	Zr	Ga	Sc	Sc	2.480	0.781	Zn	Zn	Ge	Zr	In	Sc	Sc	Y	2.898	0.880	Mg	Ca	Ba	Zn	Ti	Hf	Hf	Hf	3.440	1.025		
Be	Ba	Si	Sn	Ti	In	Al	1.818	0.905	Mg	Mg	Si	Ge	Al	Ga	In	In	2.480	0.970	Mg	Zn	Ca	Ge	Ti	Al	Al	Ga	Ga	2.898	0.934	Mg	Zn	Ti	Zr	Ga	Ga	Sc	3.441	1.061		
Mg	Ca	Ge	Sn	In	Y	Y	1.818	0.788	Mg	Ca	Zn	Zn	Si	Ge	Sn	Sn	2.481	0.879	Mg	Sr	Ti	Hf	Al	Al	Y	Y	2.898	0.636	Be	Be	Be	Ca	Si	Ti	Hf	3.441	1.152			
Sr	Sr	Si	Ge	Al	Ga	Sc	1.818	0.627	Ca	Ca	Cd	Zn	Si	Sn	Zr	Hf	2.481	0.826	Be	Be	Ge	Sn	Ga	Sc	Sc	Y	2.898	0.644	Be	Mg	Si	Ge	Al	Ga	Ga	In	3.441	1.170		
Ba	Ba	Ge	Hf	Al	Ga	Ga	1.818	0.844	Sr	Sr	Si	Ti	Al	Al	Ga	Y	2.481	0.782	Be	Sr	Sr	Zn	Ge	Sn	Ti	Ti	2.898	0.828	Be	Cd	Si	Ti	Sc	Sc	Y	Y	3.442	1.092		
Sr	Ba	Cd	Cd	Si	Sn	Sn	1.818	0.727	Zn	Zn	Ge	Hf	Ga	Ga	Sc	Y	2.481	0.697	Zn	Zn	Ge	Zr	Al	Al	Ga	Sc	2.898	0.553	Be	Ba	Zn	Zn	Ge	Ti	Zr	3.442	1.061			
Cd	Cd	Ge	Zr	Ga	Ga	In	Y	1.819	0.606	Ca	Ca	Cd	Zn	Si	Ge	Sn	Zr	2.481	0.768	Ca	Sr	Ge	Zr	Al	Al	Sc	2.898	0.567	Be	Be	Mg	Ba	Ge	Ti	Ti	Hf	3.442	0.984		
Ba	Zn	Cd	Cd	Si	Si	Sn	1.819	0.834	Ca	Cd	Cd	Sn	Sc	Y	Y	Y	2.481	0.980	Mg	Ba	Zr	Zr	Al	Al	Ga	Sc	2.898	0.870	Ca	Zn	Si	Ti	Ga	Sc	Sc	3.442	1.037			
Sr	Ba	Sn	Ti	In	In	Sc	1.819	0.717	Ba	Ba	Ti	Zr	Al	Al	Ga	Y	2.481	0.817	Sr	Cd	Si	Hf	Ga	Sc	Sc	Sc	2.898	0.968	Ca	Zn	Ti	Zr	Al	Al	Sc	3.442	1.019			
Ba	Zn	Ge	Sn	Ga	Y	Y	1.819	0.997	Be	Sr	Zr	Hf	Al	Al	In	In	2.481	0.854	Ba	Ba	Si	Zr	Al	Sc	Sc	Y	2.898	0.860	Be	Mg	Ca	Zn	Sn	Zr	Zr	3.442	1.050			
Cd	Cd	Ge	Zr	Al	Ga	Ga	In	1.819	1.159	Ba	Cd	Hf	Al	Ga	Sc	Sc	2.482	0.853	Ca	Zn	Ti	Hf	Ga	Ga	Sc	Sc	2.898	0.914	Be	Ca	Zr	Hf	Ga	In	Sc	Sc	3.442	1.055		
Ca	Ba	Cd	Cd	Sn	Sn	Zr	Hf	1.819	0.847	Sr	Zn	Ti	Zr	In	In	Sc	Sc	2.482	0.927	Ca	Cd	Ti	Zr	In	Y	Y	Y	2.898	0.609	Be	Ca	Zn	Zn	Sn	Zr	Zr	Hf	3.442	1.043	
Be	Ba	Ge	Sn	Al	Al	Al	Sc	1.820	0.882	Sr	Sr	Si	Zr	Al	In	Sc	Sc	2.482	1.044	Be	Be	Ca	Zn	Si	Si	Sn	Hf	2.898	0.628	Mg	Sr	Ba	Zn	Zr	Zr	Zr	Hf	3.442	1.068	
Zn	Cd	Ge	Hf	Al	In	In	Sc	1.820	1.106	Ba	Ba	Zn	Cd	Si	Zr	Hf	Hf	2.482	1.024	Be	Sr	Ti	Ti	Al	Al	Ga	Y	2.899	0.791	Ca	Ca	Sr	Ba	Ge	Zr	Hf	3.442	1.182		
Mg	Sr	Sn	Hf	Al	Al	In	In	1.820	0.778	Mg	Sr	Zn	Cd	Ge	Ge	Hf	Hf	2.482	1.041	Ca	Zn	Zn	Cd	Ge	Ti	Ti	Zr	2.899	0.566	Be	Be	Si	Si	Al	Ga	In	Y	3.442	1.076	
Be	Ba	Si	Sn	In	In	In	Y	1.820	0.863	Sr	Sr	Sr	Cd	Si	Sn	Ti	Hf	2.482	1.146	Mg	Ca	Zn	Zn	Ge	Ge	Sn	Hf	2.899	0.566	Be	Be	Mg	Zn	Ti	Zr	Zr	Hf	3.442	1.148	
Mg	Zn	Ge	Ge	Al	In	In	Y	1.820	1.097	Be	Ba	Zr	Hf	Ga	Ga	In	Y	2.482	0.852	Mg	Ba	Zn	Cd	Ge	Ge	Zr	Zr	2.899	0.836	Sr	Sr	Sr	Ba	Si	Ti	Zr	Hf	3.443	1.214	
Cd	Cd	Si	Hf	Al	Ga	In	In	1.820	0.767	Ca	Sr	Zn	Cd	Sn	Sn	Ti	2.482	0.868	Mg	Ca	Hf	Hf	Ga	Sc	Sc	Y	Y	2.899	0.624	Be	Be	Ca	Sr	Ge	Zr	Hf	Hf	3.443	1.097	
Sr	Ba	Sn	Zr	Al	Al	In	In	1.820	0.838	Ca	Sr	Zn	Cd	Ge	Sn	Sn	Ti	2.482	0.896	Sr	Ba	Zn	Zn	Sn	Zr	Hf	Hf	2.899	0.801	Be	Sr	Zn	Zn	Sn	Ti	Ti	Hf	3.443	1.105	
Zn	Cd	Ge	Hf	Al	Al	In	In	1.820	0.840	Ca	Sr	Ge	Ti	Al	Al	Al	Y	2.482	1.388	Ca	Ba	Zn	Cd	Ti	Zr	Zr	Zr	2.899	0.916	Ca	Sr	Sr	Ba	Si	Ge	Zr	Zr	3.443	1.087	
Sr	Zn	Sn	Sn	Sn	Sc	Y	Y	1.820	0.532	Mg	Sr	Ge	Ge	Al	Sc	Y	Y	2.482	1.256	Ca	Ba	Hf	Hf	Al	Al	Ga	Y	2.899	0.562	Mg	Sr	Sr	Ba	Sn	Sn	Ti	Ti	3.443	1.003	
Mg	Ba	Ge	Ge	Al	Al	Ga	Sc	1.820	0.826	Sr	Sr	Zn	Zn	Si	Ge	Ti	Hf	2.482	1.024	Ba	Cd	Si	Sn	Al	Al	Al	In	2.899	0.730	Ca	Sr	Ba	Ba	Si	Ge	Zr	Zr	3.443	1.091	
Ba	Zn	Zn	Cd	Ge	Ge	Sn	Zr	1.821	0.829	Be	Ca	Ge	Zr	In	Y	Y	Y	2.483	1.587	Ba	Cd	Si	Zr	Al	Y	Y	Y	2.899	0.987	Be	Ca	Sr	Ge	Zr	Zr	Hf	3.443	1.189		
Mg	Ca	Sn	Sn	Al	In	In	In	1.821	0.516	Be	Ba	Ti	Ti	Al	Ga	Ga	In	2.483	1.352	Be	Be	Mg	Sr	Ge	Sn	Sn	Hf	2.899	0.479	Mg	Ba	Ba	Ba	Si	Sn	Zr	Hf	3.443	1.082	
Zn	Zn	Si	Sn	Al	Ga	Ga	In	1.821	1.012	Mg	Ba	Cd	Cd	Ge	Ge	Ti	Zr	2.483	1.091	Ca	Ca	Si	Ti	Al	Al	In	Sc	2.899	0.534	Be	Ca	Ba	Ba	Sn	Zr	Hf	3.443	1.167		
Ca	Cd	Sn	Zr	In	In	Sc	Sc	1.821	1.009	Ca	Sr	Zn	Zn	Sn	Sn	Ti	Hf	2.483	0.792	Sr	Ba	Si	Zr	Al	Al	Sc	Sc	2.899	0.695	Be	Be	Mg	Ca	Ge	Ge	Sn	Zr	3.443	1.221	
Sr	Zn	Ge	Ge	Al	Al	Ga	Y	1.821	0.482	Be	Ba	Si	Hf	Ga	Y	Y	Y	2.483	0.773	Be	Ba	Zr	Hf	Al	Al	Al	Y	2.899	0.984	Be	Mg	Mg	Sr	Ge	Sn	Zr	Ti	3.443	1.095	
Be	Ba	Sn	Zr	Ga	Ga	Ga	Y	1.821	0.991	Sr	Zn	Sn	Hf	Al	Al	Y	Y	2.483	0.920	Ba	Zn	Si	Hf	Sc	Sc	Sc	Y	2.899	0.949	Mg	Zn	Ti	Ti	Sc	Al	Ga	Ga	3.444	1.159	
Sr	Zn	Si	Zr	In	In	Y	Y	1.821	1.140	Be	Ba	Ba	Cd	Cd	Zr	Hf	Hf	2.483	0.879	Ca	Ca	Sr	Zn	Si	Sn	Hf	Hf	2.899	0.984	Be	Ca	Si	Ti	Sc	Y	Y	Y	3.444	1.143	
Sr	Zn	Sn	Hf	Al	Al	Ga	Sc	1.822	0.941	Be	Ba	Ge	Hf	Ga	Sc	Sc	Sc	2.483	0.816	Mg	Zn	Sn	Hf	Al	Al	Sc	Sc	2.899	1.033	Be	Be	Sr	Sr	Sn	Ti	Zr	Hf	3.444	1.008	
Be	Sr	Ge	Ge	Al	Ga	Ga	Sc	1.822	0.874	Sr	Ba	Cd	Cd	Ge	Zr	Zr	Hf	2.483	0.901	Be	Cd	Si	Si	Al	Al	Ga	In	2.899	0.913	Ca	Ca	Sr	Ba	Si	Ge	Hf	Hf	3.444	1.165	
Ba	Cd	Ti	Zr	In	In	Y	Y	1.822	1.088	Sr	Ba	Si	Hf	Al	Al	Ga	Ga	2.483	1.709	Sr	Ba	Si	Ge	Sc	Y	Y	Y	2.899	1.010	Be	Mg	Hf	Hf	Al	Ga	Ga	In	3.444	1.165	
Zn	Zn	Si	Ge	Al	Ga	In	In	1.822	0.874	Ca	Ba	Si	Ti	Ga	Ga	Sc	Sc	2.483	1.592	Mg	Ca	Zr	Zr	Al	Ga	Y	Y	2.899	0.788	Be	Be	Ge	Zr	Al	Al	Ga	In	3.444	1.192	
Mg	Cd	Ge	Ti	Ga	In	In	In	1.822	0.855	Zn	Cd	Ge	Sn	Ga	Sc	Sc	Y	2.483	1.551	Ca	Sr	Sr	Zn	Ge	Sn	Zr	Zr	2.899	0.802	Mg	Ba	Zn	Zn	Si	Zr	Zr	Hf	3.444	1.173	
Ba	Zn	Si	Ti	In	In	Y	Y	1.822	1.079	Zn	Cd	Sn	Ti	Ga	Ga	Sc	Sc	2.483	0.952	Ca	Cd	Si	Hf	Al	Al	Sc	Sc	2.900	0.950	Be	Mg	Hf	Hf	Al	Al	In	Sc	3.444	1.093	
Sr	Zn	Sn	Zr	Ga	Ga	Ga	Sc	1.822	0.863	Be	Ca	Sn	Ti	Ga	Y	Y	Y	2.483	1.009	Be	Cd	Si	Sn	Al	Sc	Sc	Sc	2.900	0.705	Be	Mg	Ca	Zn	Si	Hf	Hf	Hf	3.445	1.067	
Ba	Ba	Cd	Cd	Si	Sn	Ti	Hf	1.823	0.823	Ba	Zn	Ti	Ti	Ga	Ga	Sc	Y	2.483	1.336	Be	Zn	Ti	Ti	Al	In	In	Y	2.900	0.736	Be	Be	Sr	Ba	Si	Ti	Hf	Hf	3.445	1.011	
Ba	Zn	Si	Si	Ga	Ga	In	Y	1.823	0.827	Be	Mg	Si	Sn	Al	Al	In	In	2.484	1.063	Sr	Sr	Ba	Ba	Zn	Sn	Sn	Ti	Hf	2.900	0.998	Be	Zn	Ge	Ti	Al	Al	Al	In	3.445	1.046
Sr	Sr	Zn	Cd	Ge	Sn	Hf	Hf	1.823	0.645	Be	Cd	Ti	Hf	Al	Al	In	In	2.484	1.046	Ca	Sr	Sn	Ti	Sc	Sc	Y	Y	2.900	0.942	Sr	Sr	Sr	Ba	Ge	Sn	Ti	Zr	3.445	1.033	
Ca	Ba	Sn	Hf	Al	Ga	Ga	Ga	1.824	0.811	Ca	Sr	Ba	Zn	Ge	Ge	Sn	Sn	2.484	1.383	Mg	Ca	Sr	Cd	Sn	Zr	Zr	Zr	2.900	0.845	Be	Be	Ca	Sr	Si	Zr	Zr	Hf	3.445	1.079	
Mg	Ba	Ge	Hf	Ga	Ga	In	In	1.824	0.816	Cd	Cd	Zr	Zr	Ga	In	Sc	Y	2.484	1.034	Be	Zn	Hf	Hf	Al	Sc	Y	Y	2.900	0.898	Be	Be	Mg	Zn	Ge	Ti	Zr	Zr	3.445	1.062	
Sr	Cd	Ge	Sn	Al	Al	Al	Sc	1.824	0.628	Ba	Ba	Zr	Hf	Al	Al	Ga	Y	2.484	1.281	Ca	Ca	Ba	Cd	Ti	Zr	Zr	Hf	2.900	0.725	Be	Be	Ca	Sr	Si	Zr	Hf	Hf	3.445	1.056	
Sr	Sr	Sn	Hf	Ga	In	Sc	Sc	1.824	0.999	Ba	Ba	Ti	Zr	Al	Al	In	Y	2.484	1.632	Mg	Sr	Zn	Zn	Si	Si	Ge	Sn	2.900	0.731	Be	Be	Sr	Sr	Si	Sn	Ti	Zr	3.445	1.091	
Cd	Cd	Sn	Hf	Al	Al	In	Sc	1.824	0.996	Be	Sr	Cd	Cd	Si	Si	Ge	Sn	2.484	1.118	Mg	Ba	Si	Ge	Sc	Sc	Y	Y	2.900	0.823	Be	Be	Mg	Sr	Sn	Ti	Ti	Hf	3.445	1.190	
Be	Zn	Ge	Sn	Al	Al	In	In	1.824	0.593	Zn	Zn	Ti	Hf	Al	In	In	Y	2.484																						

Sr	Cd	Si	Ti	Ga	Ga	In	In	1.839	0.631	Sr	Cd	Si	Ge	Al	Al	Sc	Sc	2.491	0.868	Be	Sr	Ba	Cd	Zr	Zr	Hf	Hf	2.906	0.890	Be	Mg	Mg	Ba	Ge	Ge	Sn	Hf	3.453	1.431		
Mg	Ba	Si	Zr	In	In	In	Y	1.839	0.726	Ca	Cd	Cd	Cd	Si	Ge	Zr	Hf	2.491	0.996	Ca	Ca	Ba	Cd	Si	Ti	Ti	Zr	2.906	1.145	Be	Mg	Zr	Zr	Al	Sc	Sc	Y	3.453	1.833		
Sr	Zn	Si	Zr	Ga	In	In	In	1.840	0.584	Be	Ca	Si	Si	Ga	Ga	In	Y	2.491	0.925	Be	Be	Ca	Cd	Si	Ti	Zr	Hf	2.906	1.112	Be	Zn	Zn	Cd	Si	Ti	Zr	Zr	3.453	1.701		
Mg	Ba	Ba	Cd	Si	Ge	Sn	Sn	1.840	0.965	Zn	Cd	Ti	Hf	Ga	Ga	Y	Y	2.491	0.959	Mg	Sr	Si	Zr	Al	Al	Al	Y	2.906	1.024	Ca	Sr	Sr	Ba	Si	Si	Ge	Sn	3.454	1.383		
Sr	Sr	Ge	Hf	Al	Ga	Ga	In	1.840	0.924	Ca	Ca	Zn	Cd	Si	Ge	Ti	Y	2.491	0.895	Mg	Ca	Sn	Ti	Zr	Al	Y	Y	2.906	1.070	Mg	Ca	Si	Zr	Sc	Sc	Sc	Y	3.454	1.854		
Sr	Ba	Si	Zr	In	In	In	Y	1.840	0.577	Mg	Cd	Hf	Hf	Ga	In	Y	Y	2.491	1.023	Ca	Sr	Ti	Ti	In	Sc	Y	Y	2.907	0.854	Mg	Zn	Zn	Ti	Al	Al	Al	Sc	3.454	1.726		
Be	Ca	Sn	Zr	Al	In	In	In	1.840	0.887	Mg	Ca	Sr	Cd	Sn	Sn	Sn	Zr	2.491	1.127	Be	Be	Ba	Cd	Ti	In	Sc	Y	2.907	0.904	Mg	Zn	Ge	Hf	Al	Al	Sc	Sc	3.454	1.557		
Be	Sr	Sn	Hf	Ga	In	Y	Y	1.840	0.989	Be	Mg	Sn	Ti	Al	In	In	In	2.491	1.039	Mg	Sr	Ba	Cd	Ti	Ti	Ti	Zr	2.907	0.988	Be	Mg	Zn	Cd	Sn	Ti	Ti	Ti	3.454	1.945		
Sr	Zn	Sn	Ti	Ga	In	In	Sc	1.840	0.545	Be	Cd	Ti	Ti	Al	Ga	In	In	2.491	1.136	Mg	Ca	Ge	Zr	In	Sc	Sc	Sc	2.907	0.775	Be	Be	Ti	Ti	Al	In	Sc	Sc	Y	3.454	1.686	
Be	Ba	Si	Hf	Ga	In	In	In	1.840	0.872	Zn	Zn	Ge	Hf	Al	Al	In	Sc	2.491	1.234	Sr	Ba	Zn	Zr	Ge	Ti	Ti	Zr	2.907	0.839	Mg	Ca	Zn	Zn	Si	Ti	Hf	Hf	3.455	1.524		
Cd	Cd	Si	Ge	Al	Al	Ga	In	1.840	0.905	Sr	Cd	Sn	Zr	Sc	Sc	Sc	Y	2.491	0.884	Be	Be	Sr	Cd	Si	Ge	Hf	Hf	2.907	1.028	Mg	Mg	Mg	Ba	Sn	Ti	Zr	Hf	3.455	1.982		
Mg	Ba	Si	Ti	In	In	In	Y	1.841	0.540	Zn	Zn	Si	Hf	In	In	Sc	Y	2.491	0.926	Cd	Cd	Zr	Hf	Al	Al	Sc	Sc	Y	2.907	0.847	Sr	Sr	Ba	Ba	Ge	Sn	Ti	Zr	3.455	1.709	
Mg	Ba	Zn	Cd	Ge	Ge	Sn	Sn	1.841	0.674	Mg	Sr	Sn	Ti	Al	Al	Y	Y	2.491	0.960	Sr	Sr	Ba	Zn	Ge	Ge	Sn	Sn	2.907	1.033	Mg	Ca	Sr	Ba	Sn	Sn	Ti	Ti	3.455	1.251		
Sr	Sr	Si	Ge	Ge	Ga	In	Y	1.841	0.705	Sr	Zn	Ti	Zr	Ga	Ga	Ga	In	2.491	1.039	Zn	Zn	Zr	Hf	Al	Al	In	Sc	2.907	1.082	Be	Ca	Si	Ba	Al	Al	Ga	Ga	3.455	1.361		
Be	Ba	Zn	Cd	Si	Ge	Hf	Hf	1.841	0.513	Mg	Sr	Si	Si	Ga	In	Sc	Sc	2.492	0.929	Ba	Ba	Si	Ti	Ga	Sc	Sc	Y	2.907	0.752	Mg	Zn	Cd	Cd	Si	Si	Ti	Zr	3.455	1.335		
Be	Ba	Sn	Ti	Ti	Ga	Ga	Y	1.841	0.661	Be	Ca	Ge	Ge	Al	Al	Ga	Sc	2.492	0.789	Be	Be	Ca	Cd	Ge	Ge	Zr	Hf	2.907	0.966	Be	Be	Sr	Ba	Sn	Sn	Zr	Zr	3.455	1.660		
Cd	Cd	Ge	Sn	In	Sc	Sc	Y	1.841	0.699	Ca	Ca	Si	Hf	Al	Ga	Ga	In	2.492	1.216	Ca	Zn	Ge	Hf	Sc	Sc	Y	Y	2.907	1.140	Mg	Ca	Ba	Ba	Ge	Sn	Sn	Hf	3.455	2.027		
Be	Cd	Ge	Sn	Al	Ga	Ga	Ga	1.841	0.502	Be	Ba	Ca	Ti	In	Sc	Sc	Sc	2.492	1.037	Sr	Sr	Sr	Zn	Si	Sn	Ti	Hf	2.907	0.725	Mg	Ca	Ba	Ba	Ge	Sn	Sn	Zr	3.456	1.883		
Ca	Cd	Si	Ge	In	Al	Sc	Sc	1.841	0.771	Ba	Ba	Ge	Hf	In	Sc	Y	Y	2.492	0.854	Sr	Cd	Ti	Zr	Al	Al	Sc	Sc	2.907	0.812	Be	Cd	Si	Hf	Al	Al	Al	Y	3.456	1.625		
Ca	Ba	Si	Ge	In	Ga	Ga	Ga	1.841	0.775	Be	Ba	Ge	Cd	Sn	Ti	Zr	Zr	2.492	0.699	Sr	Zn	Ge	Ti	Ga	Sc	Sc	Sc	2.907	0.967	Mg	Mg	Ti	Hf	Ga	Sc	Sc	Y	3.456	2.064		
Mg	Zn	Sn	Hf	In	In	In	Y	1.841	0.467	Mg	Cd	Si	Zr	Al	Al	In	In	2.492	0.732	Be	Be	Sr	Zn	Ge	Ge	Sn	Ti	2.907	1.173	Be	Ba	Ba	Ba	Ge	Sn	Zr	Hf	3.456	1.902		
Sr	Ba	Si	Ge	Al	Al	In	In	1.841	1.100	Mg	Ca	Sr	Cd	Sn	Sn	Hf	Hf	2.492	0.773	Zn	Zn	Si	Ge	Al	Sc	Y	Y	2.908	1.130	Be	Sr	Zn	Cd	Cd	Si	Si	Zr	3.456	1.391		
Sr	Ba	Sn	Ti	Ga	Ga	Ga	Sc	1.842	1.045	Zn	Zn	Sn	Hf	Al	Al	Sc	Y	2.492	0.808	Mg	Zn	Ge	Zr	Ga	Al	Sc	Sc	2.908	1.171	Mg	Mg	Ca	Sr	Si	Ge	Ge	Sn	3.456	1.502		
Sr	Zn	Sn	Hf	Al	Al	Y	Y	1.842	0.839	Mg	Mg	Ba	Cd	Cd	Ge	Sn	Zr	2.492	0.839	Mg	Ba	Ge	Ti	Zr	Al	Al	Ga	Sc	2.908	1.213	Be	Ca	Ti	Hf	Al	Al	Al	Ga	3.456	1.550	
Zn	Cd	Si	Hf	Al	In	In	In	1.842	1.024	Sr	Sr	Zn	Cd	Sn	Zr	Hf	Hf	2.492	0.867	Ca	Zn	Si	Zr	In	Y	Y	Y	2.908	1.095	Be	Be	Ca	Ba	Sn	Ti	Zr	Zr	3.456	1.441		
Sr	Ba	Cd	Cd	Sn	Sn	Ti	Hf	1.842	1.036	Ca	Ca	Cd	Hf	Hf	Ga	Ga	Y	Y	2.493	1.264	Mg	Ca	Zr	Hf	Ga	Y	Y	Y	2.908	1.190	Ca	Ca	Ba	Ba	Si	Ge	Sn	Hf	3.457	1.568	
Ba	Zn	Si	Ge	Ga	Ga	Ga	Sc	1.842	0.815	Mg	Sr	Sr	Cd	Ge	Ge	Sn	Ti	2.493	1.179	Ca	Sr	Zr	Zr	Al	Al	Ga	Sc	2.908	0.947	Mg	Ca	Zn	Zn	Ge	Zr	Hf	Hf	3.457	1.819		
Ba	Cd	Ge	Hf	Al	Al	Ga	Ga	1.842	1.008	Sr	Sr	Sr	Cd	Si	Sn	Ti	Zr	2.493	1.125	Ca	Ba	Ti	Hf	Al	Al	Al	Ga	2.908	0.994	Be	Mg	Ti	Ti	Al	Sc	Y	Y	3.457	1.289		
Ba	Zn	Si	Si	Ga	In	Y	Y	1.842	1.033	Ca	Ca	Si	Hf	Al	Al	In	Y	2.493	0.775	Mg	Mg	Mg	Cd	Si	Zn	Ge	Hf	2.908	1.131	Mg	Zn	Ge	Zr	Al	Al	Al	Sc	3.457	1.243		
Ba	Ba	Si	Si	Ge	Al	Al	Ga	In	1.843	0.810	Be	Ca	Ti	Hf	Al	In	In	2.493	0.856	Be	Sr	Ti	Zr	Ge	Sc	Sc	Sc	2.908	0.827	Mg	Mg	Sr	Ba	Sn	Zr	Hf	3.457	1.175			
Ca	Cr	Si	Hf	In	In	In	Y	1.843	0.804	Sr	Ba	Zn	Cd	Ti	Ti	Zr	Zr	2.493	0.997	Be	Be	Sr	Cd	Sn	Ti	Ti	Zr	2.908	0.917	Be	Be	Ca	Ba	Si	Si	Ti	Hf	3.458	0.934		
Ba	Ba	Si	Sn	In	Sc	Sc	Y	1.843	0.839	Sr	Ba	Ti	Hf	Al	Al	In	In	2.493	0.910	Ca	Ba	Zr	Zr	Al	Al	Ga	Sc	2.908	1.166	Be	Mg	Mg	Cd	Ge	Ti	Ti	Hf	3.458	1.140		
Mg	Zn	Si	Ge	Al	In	In	In	1.843	0.809	Ca	Ca	Ti	Hf	Ga	Ga	Y	Y	2.493	0.956	Mg	Ba	Ti	Hf	Ga	Sc	Sc	Sc	2.908	Y.112	Be	Sr	Sr	Ba	Ge	Sn	Sn	Ti	3.458	1.084		
Mg	Ba	Si	Sn	Ga	Y	Y	Y	1.844	0.791	Ba	Cd	Ge	Hf	Ga	Sc	Sc	Sc	2.493	1.069	Mg	Sr	Sn	Ti	Sc	Ge	Y	Y	Y	2.908	1.026	Be	Ca	Sr	Ba	Zn	Si	Si	Si	Hf	3.458	0.963
Zn	Zn	Ge	Sn	Al	Ga	Ga	Y	1.844	0.834	Ca	Cd	Zr	Zr	Ga	In	In	Sc	2.493	0.834	Sr	Sr	Ba	Zn	Sc	Ge	Sn	Zr	2.908	1.072	Ca	Ca	Sr	Ba	Si	Sn	Zr	Hf	3.458	1.166		
Ca	Ba	Sn	Zr	Ga	Ga	Ga	Sc	1.844	0.798	Ba	Ba	Ge	Ti	In	Sc	Sc	Y	2.494	1.069	Ca	Cd	Si	Si	Ga	Sc	Y	Y	2.908	0.874	Ca	Ca	Sr	Ba	Ge	Ti	Hf	Hf	3.458	1.116		
Sr	Ba	Cd	Cd	Ge	Ge	Sn	Zr	1.844	0.899	Mg	Mg	Sn	Hf	Ga	Ga	Sc	Y	2.494	1.254	Mg	Mg	Ca	Zn	Si	Ge	Sn	Sn	2.908	0.922	Mg	Mg	Zr	Hf	Al	Al	Ga	Y	3.458	1.051		
Ba	Ba	Ge	Ti	Al	Ga	Ga	Y	1.844	0.905	Ca	Ba	Cd	Cd	Ge	Ge	Sn	Zr	2.494	0.942	Be	Sr	Zn	Cd	Ge	Ge	Ge	Zr	2.909	0.997	Be	Zn	Ti	Hf	Ga	Sc	Sc	Sc	3.458	1.283		
Be	Sr	Sn	Zr	Ga	Ga	Ga	In	1.844	0.764	Sr	Sr	Ti	Hf	Al	Al	Ga	Y	2.494	1.163	Ba	Zn	Si	Zr	Ga	Sc	Sc	Sc	2.909	0.795	Be	Be	Mg	Sr	Si	Sn	Zr	Zr	3.458	1.108		
Ba	Ba	Ge	Ti	Al	In	In	Sc	1.844	0.871	Mg	Ba	Ti	Hf	Al	Al	In	In	2.494	1.342	Ca	Ca	Ti	Hf	In	Sc	Sc	Y	Y	2.909	0.859	Mg	Mg	Ba	Zn	Si	Ti	Zr	Zr	3.458	1.093	
Mg	Ba	Ge	Sn	Al	Al	Y	Y	1.844	0.898	Zn	Zn	Ti	Zr	Ga	In	Y	Y	2.494	0.716	Be	Cd	Si	Sn	Sc	Sc	Sc	Y	2.909	1.037	Be	Be	Ti	Ti	Al	Ga	In	Y	3.458	1.326		
Ca	Ba	Ge	Hf	In	In	Y	Y	1.845	1.150	Ba	Ba	Ti	Hf	Al	In	In	Sc	2.494	0.776	Be	Cd	Ge	Ti	Al	Al	Ga	Ga	2.909	0.867	Be	Mg	Ba	Si	Ti	Ti	Hf	3.458	1.138			
Sr	Zn	Ge	Zr	In	In	Sc	Sc	1.845	0.859	Be	Ba	Ba	Cd	Cd	Ge	Ti	Hf	Hf	2.494	0.814	Be	Mg	Ca	Zn	Si	Si	Sn	Sn	2.909	1.048	Be	Mg	Zr	Zr	Al	In	Sc	Sc	3.459	0.985	
Ba	Cd	Ti	Hf	Al	In	In	In	1.845	0.893	Mg	Ba	Si	Si	Ga	Ga	Sc	Y	2.494	0.988	Sr	Cd	Si	Ti	Al	Al	Sc	Sc	2.909	1.088	Be	Zn	Si	Si	Al	Sc	Y	Y	3.459	1.019		
Ba	Ba	Zn	Cd	Si	Sn	Sn	Ti	1.845	1.141	Mg	Mg	Sn	Zr	Al	Al	In	Y	2.494	0.910	Ca	Ba	Zn	Zn	Ge	Ti	Hf	Hf	2.909	0.770	Be	Be	Sr	Ba	Ge	Ti	Hf	Hf	3.460	0.923		

Zn	Zn	Sn	Zr	Al	In	In	Y	1.856	0.784	Ca	Ba	Zn	Zn	Ge	Ge	Zr	Hf	2.500	1.010	Be	Ba	Ba	Zn	Sn	Ti	Hf	Hf	2.914	0.742	Be	Mg	Zn	Zn	Si	Ge	Hf	Hf	3.467	0.525	
Mg	Ba	Ge	Ge	In	Sc	Sc	Y	1.856	0.399	Zn	Cd	Ge	Ge	Al	Sc	Y	Y	2.500	1.038	Be	Mg	Sr	Ba	Si	Si	Sn	Sn	2.914	0.909	Be	Mg	Si	Ge	Sc	Sc	Sc	3.467	0.297		
Sr	Cd	Ge	Zr	Al	Ga	Ga	Y	1.856	0.783	Ca	Ca	Ti	Ba	Hf	Al	Sc	Sc	2.500	1.094	Ca	Ca	Ti	Zr	Al	Al	Ga	In	2.914	0.709	Be	Be	Mg	Sr	Sn	Ti	Zr	3.468	0.512		
Mg	Zn	Sn	Hf	Al	In	In	In	1.857	0.780	Be	Zn	Zn	Zr	Al	Al	In	In	2.500	0.797	Ca	Cr	Ge	Hf	Sc	Sc	Y	Y	2.915	0.721	Mg	Zn	Ti	Ti	Al	Sc	Y	Y	3.468	0.578	
Be	Ca	Sn	Sn	Al	Al	Al	Sc	Y	1.857	0.394	Sr	Ba	Si	Ti	Al	Al	In	In	2.500	0.824	Be	Ca	Zn	Zn	Ge	Sn	Zr	Zr	2.915	0.859	Mg	Ca	Ba	Zn	Ti	Ti	Ti	Hf	3.468	0.340
Ba	Zn	Cd	Cd	Ge	Al	Sn	Sn	Ti	1.857	0.623	Ba	Zn	Si	Ge	Al	Al	Al	Ga	2.500	0.821	Be	Cd	Ge	Hf	Sc	Sc	Y	Y	2.915	0.869	Be	Mg	Mg	Ba	Ge	Ge	Sn	Zr	3.468	0.284
Ca	Cd	Sn	Zr	Zr	Al	Ga	Ga	Ga	1.857	0.683	Ca	Ba	Hf	Hf	Ga	Ga	In	Y	2.500	0.822	Mg	Mg	Ge	Hf	In	Sc	Y	Y	2.915	0.877	Be	Mg	Sr	Ba	Si	Si	Sn	3.468	0.135	
Ca	Zn	Cd	Cd	Si	Ge	Sn	Sn	Sn	1.857	0.431	Mg	Ca	Ba	Cd	Ge	Ge	Sn	Sn	2.500	0.785	Sr	Zn	Si	Zr	In	Sc	Sc	Sc	2.915	0.851	Mg	Ca	Ba	Ba	Si	Sn	Sn	Ti	3.468	0.100
Ba	Ba	Sn	Zr	Al	Al	In	Sc	Sc	1.857	0.605	Be	Be	Ba	Cd	Ge	Ge	Sn	Ti	2.501	0.693	Mg	Ca	Ba	Zn	Sn	Sn	Zr	Zr	2.915	0.816	Be	Be	Ca	Sr	Sn	Sn	Ti	Zr	3.468	0.370
Cd	Cd	Sn	Ti	Al	Al	Ga	In	In	1.857	0.678	Be	Ca	Ti	Ti	Ga	In	Y	Y	2.501	0.977	Zn	Cd	Si	Zr	Ga	Y	Y	Y	2.915	0.873	Mg	Ca	Ba	Ba	Sn	Sn	Ti	Hf	3.468	0.635
Sr	Zn	Sn	Hf	Ga	Al	In	Sc	Sc	1.857	0.420	Be	Sr	Ge	Zr	Al	Al	Y	Y	2.501	0.887	Be	Mg	Sn	Zr	Sc	Sc	Y	Y	2.915	0.759	Mg	Ba	Ba	Zn	Zn	Ti	Zr	Hf	3.468	0.523
Be	Sr	Ge	Sn	Al	Y	Y	Y	1.857	0.718	Ba	Ba	Zn	Cd	Si	Zr	Zr	Hf	2.501	0.723	Mg	Mg	Sr	Cd	Sn	Sn	Ti	Hf	2.915	0.777	Be	Zn	Zn	Zn	Si	Sn	Ti	Hf	3.469	0.610	
Be	Cd	Ge	Sn	Ga	Ga	Ga	Y	1.858	0.729	Sr	Sr	Ba	Cd	Ge	Ge	Sn	Sn	Ti	2.501	0.787	Mg	Ba	Cd	Cd	Si	Ti	Ti	Hf	2.915	0.855	Be	Be	Ca	Ba	Ge	Ti	Ti	Hf	3.469	0.680
Be	Ba	Ge	Zr	In	In	Sc	Sc	1.858	0.373	Sr	Sr	Sr	Ba	Cd	Ge	Ge	Sn	Zr	2.501	0.754	Ca	Ba	Zr	Hf	Al	Al	Al	Ga	2.915	1.007	Ca	Sr	Sr	Ba	Ge	Ti	Zr	Zr	3.469	0.551
Ca	Zn	Ge	Ge	Al	Ga	Y	Y	1.858	1.032	Mg	Ba	Zn	Si	Ti	Al	Al	In	In	2.501	0.704	Mg	Ca	Ba	Cd	Ti	Ti	Zr	Zr	2.915	0.893	Mg	Ca	Zn	Cd	Zr	Zr	Hf	Hf	3.469	0.406
Ca	Cd	Si	Ti	Ga	In	In	In	1.858	0.932	Sr	Sr	Zn	Zn	Si	Ge	Ti	Zr	Zr	2.501	0.945	Be	Mg	Zn	Zn	Ge	Zr	Hf	Hf	2.915	0.715	Be	Mg	Zn	Cd	Ti	Ti	Ti	Hf	3.469	0.264
Be	Cd	Sn	Ge	Al	In	In	Y	1.858	0.692	Be	Zn	Ge	Zr	Al	Al	Y	Y	2.501	0.878	Be	Mg	Si	Sn	Al	Ga	Ga	Ga	2.915	1.265	Be	Cd	Ge	Ti	Al	Sc	Sc	Sc	3.469	0.311	
Ba	Zn	Si	Ge	Al	Ga	Ga	Ga	1.858	0.929	Zn	Zn	Zn	Si	Ti	Al	Al	In	Sc	2.501	0.777	Be	Mg	Sn	Zr	Al	Y	Y	Y	2.915	1.093	Mg	Sr	Ba	Ba	Si	Sn	Hf	Hf	3.469	0.468
Ca	Ca	Ge	Hf	In	In	Sc	Y	1.858	0.918	Mg	Ca	Si	Hf	Ga	Ga	In	In	2.501	1.004	Mg	Mg	Si	Sn	Al	Al	Sc	Y	2.915	0.794	Be	Be	Be	Ca	Si	Sn	Ti	Zr	3.469	0.346	
Ca	Cd	Ge	Zr	Al	Al	In	In	1.859	0.665	Ba	Ba	Si	Ti	Ti	Ga	In	Sc	Sc	2.501	0.931	Sr	Zn	Si	Ti	Ga	Y	Y	Y	2.915	0.546	Mg	Zn	Si	Hf	In	Sc	Sc	Sc	3.469	0.568
Ba	Zn	Ge	Sn	Al	Al	Al	Ga	1.859	0.908	Ba	Cd	Ti	Ti	Al	Al	In	Sc	2.501	0.850	Be	Ca	Zr	Hf	Ga	Ga	Ga	In	2.916	0.641	Mg	Mg	Zn	Zn	Sn	Ti	Zr	Hf	3.469	1.095	
Mg	Cd	Sn	Zr	In	In	Al	Sc	1.859	0.915	Ca	Sr	Ti	Ti	Al	Al	In	Y	Y	2.501	0.840	Be	Ba	Ba	Zn	Sn	Zr	Hf	Hf	2.916	0.603	Sr	Sr	Sr	Ba	Si	Sn	Ti	Zr	3.469	0.911
Mg	Mg	Sn	Sn	Al	Ga	Ga	Sc	1.859	0.660	Be	Cd	Ge	Sn	Sc	Sc	Y	Y	2.502	0.769	Mg	Mg	Ge	Ti	Ga	Ga	In	Sc	2.916	0.647	Mg	Ca	Ba	Ba	Ge	Sn	Hf	Hf	3.469	0.752	
Mg	Sr	Sn	Ti	Ti	Ga	Ga	In	1.859	0.734	Cd	Cd	Sn	Zr	Za	Sc	Y	Y	2.502	0.784	Be	Ca	Ti	Ti	Ti	Ga	Sc	Y	Y	2.916	0.786	Be	Sr	Ba	Ba	Ge	Sn	Ti	Zr	3.469	0.450
Ca	Ca	Sn	Ti	Ti	Ga	In	Sc	Y	1.860	0.806	Ca	Ca	Sr	Cd	Si	Sn	Zr	Zr	2.502	1.024	Be	Ba	Ba	Zn	Ge	Zr	Hf	Hf	2.916	0.690	Mg	Cd	Ge	Ti	Sc	Sc	Sc	Y	3.470	0.562
Ba	Zn	Si	Si	In	In	Sc	Y	1.860	0.712	Be	Be	Sr	Zn	Ge	Sn	Sn	Zr	Zr	2.502	0.884	Ca	Sr	Si	Si	Si	Ga	Sc	Y	2.916	1.393	Be	Mg	Ge	Hf	Al	Al	Y	Y	3.470	0.414
Ca	Ba	Cd	Cd	Ge	Sn	Sn	Hf	1.860	0.714	Be	Zn	Si	Ge	In	Y	Y	Y	Y	2.502	0.834	Ca	Ba	Zn	Zn	Sn	Ti	Zr	Zr	2.916	1.328	Mg	Ca	Si	Si	Al	Sc	Sc	Y	3.470	0.677
Ca	Zn	Sn	Zr	Ge	Al	Al	In	1.860	0.801	Mg	Sr	Ti	Zr	In	In	Sc	Sc	2.502	0.874	Mg	Sr	Cd	Cd	Ge	Zr	Zr	Hf	2.916	1.196	Be	Ca	Ba	Ba	Ge	Sn	Sn	Zr	3.470	0.597	
Ba	Ba	Cd	Cd	Ge	Sn	Ti	Zr	1.860	0.701	Sr	Cd	Si	Ti	Ga	Ga	Sc	Sc	2.502	0.946	Mg	Ca	Ca	Cd	Ge	Zr	Zr	Hf	2.916	0.681	Ca	Zn	Sr	Ba	Ge	Ti	Zr	Hf	3.470	0.456	
Zn	Zn	Sn	Zr	Za	In	In	Y	1.860	0.823	Mg	Mg	Sn	Hf	Ga	Ga	In	Sc	2.502	1.033	Be	Be	Be	Cd	Ge	Ti	Zr	Hf	2.916	0.864	Mg	Zn	Zn	Cd	Si	Zr	Zr	Hf	3.470	0.549	
Mg	Cd	Ge	Zr	In	In	In	Y	1.860	0.836	Ca	Ba	Ti	Ti	Al	Ga	Ga	Y	2.503	1.033	Sr	Ba	Zr	Zr	Al	Sc	Y	Y	2.916	0.974	Be	Be	Ca	Sr	Sn	Ti	Ti	Hf	3.470	0.816	
Mg	Ca	Zn	Cd	Ge	Sn	Sn	Sn	1.861	0.650	Be	Sr	Si	Zr	Ga	Ga	Ga	Y	2.503	1.056	Mg	Ca	Sr	Ba	Ge	Sn	Sn	Sn	2.916	0.795	Sr	Sr	Sr	Ba	Si	Ge	Sn	Hf	3.470	0.579	
Ba	Ba	Ge	Ti	Ga	In	In	Sc	1.861	0.838	Be	Ba	Ba	Cd	Sn	Zr	Zr	Hf	2.503	1.099	Be	Be	Sr	Zn	Si	Ge	Ge	Hf	2.916	1.003	Be	Ca	Zn	Zn	Ge	Zr	Hf	Hf	3.471	0.791	
Sr	Sr	Zn	Cd	Ge	Sn	Zr	Zr	1.861	0.911	Mg	Ca	Si	Si	Al	Ga	In	In	2.503	0.829	Be	Ca	Ca	Cd	Sn	Zr	Hf	Hf	2.916	1.044	Be	Ca	Sr	Ba	Sn	Sn	Ti	Ti	3.471	0.866	
Be	Sr	Si	Si	Ga	In	In	Y	1.861	1.138	Cd	Cd	Ti	Zr	Ga	Ga	In	Sc	2.503	0.858	Sr	Cd	Zr	Zr	Al	Sc	Y	Y	2.917	0.764	Mg	Zn	Zn	Cd	Si	Si	Ge	Ti	3.471	0.618	
Ba	Zn	Sn	Ti	Al	Ga	Ga	Ga	1.861	0.818	Sr	Ba	Hf	Hf	Ga	In	Sc	Sc	2.503	0.853	Ca	Zn	Ti	Hf	In	Y	Y	Y	2.917	1.071	Be	Ca	Sr	Zn	Ti	Ti	Ti	Hf	3.471	0.515	
Ca	Sr	Cd	Cd	Si	Ge	Ge	Sn	1.861	0.906	Cd	Cd	Sn	Hf	Al	Sc	Sc	Y	2.503	0.862	Be	Be	Zr	Hf	In	Sc	Y	Y	2.917	1.307	Be	Be	Ca	Sr	Sn	Sn	Zr	Hf	3.471	0.376	
Ca	Sr	Si	Sn	Ga	Ga	Sc	Sc	1.861	1.129	Be	Sr	Ba	Cd	Ge	Ge	Zr	Zr	2.503	0.831	Mg	Ba	Ba	Cd	Si	Si	Ge	Ti	2.917	0.853	Be	Be	Be	Zn	Si	Ge	Ti	Zr	3.471	0.378	
Ba	Cd	Sn	Ti	Al	Al	Ga	Ga	1.861	0.906	Ca	Ca	Sr	Cd	Ge	Ge	Sn	Hf	2.503	0.741	Be	Be	Si	Cd	Ga	In	Sc	Sc	2.917	1.203	Be	Be	Zn	Cd	Si	Si	Ti	Zr	3.471	0.676	
Ca	Zn	Sn	Hf	Ga	Ga	Ga	In	1.862	0.919	Cd	Cd	Sn	Ti	In	Sc	Sc	Y	2.503	1.004	Mg	Ca	Zr	Sr	In	Y	Y	Y	2.917	1.389	Ca	Zn	Ti	Hf	Al	Sc	Sc	Sc	3.471	0.930	
Ba	Cd	Sn	Ti	Ga	Sc	Ga	Sc	1.862	1.077	Sr	Ba	Hf	Hf	Al	Al	Ga	Y	2.503	0.930	Be	Be	Mg	Cd	Si	Si	Sn	Zr	2.917	0.580	Be	Mg	Sr	Zn	Ti	Ti	Ti	Zr	3.471	0.846	
Be	Cd	Si	Ge	In	In	In	Sc	1.862	0.654	Sr	Ba	Ba	Cd	Si	Si	Sn	Hf	2.503	0.754	Mg	Sr	Zn	Cd	Sn	Hf	Hf	Hf	2.917	0.669	Be	Cd	Si	Ge	Al	Al	Sc	Sc	3.471	0.902	
Sr	Zn	Si	Hf	Ga	Ga	Ga	In	1.863	0.662	Be	Be	Ge	Sn	In	Sc	Y	Y	2.503	0.836	Mg	Mg	Cd	Cd	Si	Ge	Zr	Hf	2.917	0.654	Mg	Ca	Si	Si	Al	Sc	Y	Y	3.472	0.982	
Ba	Ba	Sn	Zr	Ga	In	Sc	Sc	1.863	0.592	Ba	Cd	Ti	Hf	Ga	Ga	Sc	Sc	2.503	0.805	Be	Be	Ca	Cd	Ti	Zr	Za	Sc	Hf	2.917	1.159	Be	Mg	Ba	Zn	Ge	Ge	Ti	Ti	3.472	0.860
Be	Cd	Sn	Sn	In	Sc	Sc	Y	1.863	0.784	Sr	Cd	Ge	Hf	Ga	Y	Y	Y	2.503	0.729	Zn	Cd	Si	Zr	Za	Ga	Sc	Sc	2.917												

Sr	Cd	Sn	Zr	Al	Al	Y	Y	1.876	0.604	Ca	Ba	Ti	Zr	Ga	Ga	In	In	2.510	0.978	Sr	Sr	Si	Hf	Ga	Sc	Y	Y	2.923	0.678	Mg	Mg	Ca	Sr	Ge	Ge	Sn	Zr	3.480	0.762	
Ca	Cd	Sn	Zr	Al	Al	Ga	Ga	Y	1.876	0.868	Ca	Ba	Sn	Ti	Al	Al	Sc	Sc	2.510	0.815	Mg	Ca	Zn	Cd	Si	Si	Si	Sn	2.923	0.966	Mg	Sr	Sr	Ba	Sn	Zr	Hf	Hf	3.480	0.727
Ca	Cd	Ge	Hf	Ga	Ga	Ga	Y	1.877	0.885	Ca	Sr	Si	Zr	Al	Al	In	In	2.510	1.222	Mg	Ba	Si	Ti	Al	Al	Al	In	2.923	1.082	Be	Be	Ti	Hf	Ga	In	Sc	Sc	3.480	0.771	
Ca	Ba	Cd	Cd	Ge	Sn	Sn	Zr	1.877	0.587	Zn	Cd	Hf	Hf	Al	Al	In	Y	2.510	1.046	Mg	Ca	Zn	Zn	Ge	Ge	Sn	Zr	2.923	0.597	Ca	Ba	Ba	Ba	Ge	Sn	Ti	Hf	3.480	0.739	
Zn	Cd	Sn	Ti	Ga	Ga	Ga	In	1.877	1.047	Sr	Ca	Ge	Sr	Zr	Al	Al	Ga	Ga	2.510	0.865	Be	Ca	Zr	Zr	Ga	Sc	Y	2.923	0.714	Be	Be	Si	Zr	In	Sc	Sc	Y	3.481	0.937	
Sr	Ge	Hf	Al	Al	Ga	Ga	Sc	1.877	1.045	Ca	Ba	Ge	Hf	In	Y	Y	Y	2.510	0.744	Ba	Cd	Si	Zr	Sc	Sc	Sc	Y	2.923	0.734	Sr	Sr	Sr	Ba	Si	Ge	Sn	Zr	3.481	0.783	
Zn	Cd	Ge	Zr	In	In	In	Sc	1.877	0.539	Sr	Ba	Ti	Zr	Zr	Ga	Ga	In	2.510	0.667	Be	Be	Mg	Sr	Ge	Sn	Sn	Zr	2.923	0.750	Be	Be	Ba	Ba	Si	Ge	Ti	Hf	3.481	0.731	
Ca	Zn	Si	Ge	Ga	Ga	Ga	In	1.877	1.052	Ca	Ba	Ge	Hf	In	Sc	Sc	Sc	2.510	0.786	Be	Be	Si	Ge	Ga	In	In	Sc	2.923	0.702	Be	Mg	Si	Si	Al	Al	In	Y	3.481	0.944	
Zn	Zn	Ge	Sn	Ga	In	Sc	Sc	1.877	1.220	Mg	Mg	Ca	Cd	Si	Ge	Sn	Sn	2.511	0.858	Ca	Sr	Ge	Ti	Ga	Sc	Sc	Sc	2.923	0.637	Mg	Mg	Sr	Zn	Si	Zr	Hf	Hf	3.482	0.785	
Cd	Cd	Si	Zr	Al	Ga	In	In	1.877	1.029	Ca	Zn	Zn	Cd	Si	Ge	Ge	Zr	2.511	0.715	Zn	Cd	Si	Si	Ga	Sc	Y	Y	2.923	0.914	Be	Be	Sn	Ti	Al	Al	Ga	Y	3.482	0.703	
Sr	Sr	Si	Ge	Al	Al	Ga	In	1.877	0.920	Be	Mg	Mg	Ge	Zr	Ga	In	In	2.511	0.865	Mg	Mg	Si	Hf	Al	Ga	Y	Y	2.923	0.849	Be	Zn	Cd	Cd	Ge	Ti	Ti	Zr	3.482	0.930	
Be	Zn	Ge	Sn	Ga	Ga	Ga	In	1.877	1.164	Ba	Cd	Si	Hf	Al	Al	Al	Ga	2.511	1.273	Mg	Sr	Ti	Hf	Al	Al	Al	In	2.924	0.699	Be	Zn	Zn	Cd	Ge	Ti	Ti	Hf	3.482	0.788	
Ba	Cd	Ge	Ge	In	Sc	Y	Y	1.878	0.958	Sr	Sr	Zr	Zr	Al	Al	In	Sc	2.511	1.153	Be	Be	Ba	Cd	Ge	Ge	Ti	Zr	2.924	0.578	Be	Be	Ti	Zr	Ga	Sc	Sc	Y	3.482	0.804	
Sr	Ba	Cd	Cd	Si	Ge	Zr	Zr	1.878	0.899	Sr	Sr	Ge	Hf	In	Sc	Y	Y	2.511	1.125	Be	Ca	Si	Si	Al	Al	In	Y	2.924	0.693	Be	Mg	Ti	Zr	Ga	Ga	Ga	In	3.482	0.966	
Mg	Sr	Sn	Zr	Al	Al	In	In	1.878	1.154	Ca	Sr	Ba	Cd	Ge	Ge	Zr	Zr	2.511	0.832	Be	Ca	Zn	Zn	Ge	Sn	Sn	Ti	2.924	0.654	Mg	Zn	Ti	Ti	Al	Al	Ga	Y	3.482	0.772	
Ca	Ba	Ge	Sn	Ga	Sc	Sc	Sc	1.878	0.946	Sr	Cd	Ti	Ti	Al	Al	Ga	In	2.511	0.760	Ba	Ba	Ba	Ba	Zn	Si	Ge	Ti	Zr	2.924	0.627	Mg	Mg	Ge	Ti	Al	Al	Ga	Sc	3.482	0.762
Ba	Ba	Zn	Cd	Ge	Ge	Zr	Hf	1.878	0.865	Ca	Ba	Si	Ge	Ga	Sc	Sc	Sc	2.511	1.003	Be	Ca	Ti	Zr	Ga	Ga	Ga	In	2.924	0.813	Ca	Sr	Si	Ti	Sc	Y	Y	Y	3.482	0.747	
Mg	Ca	Zn	Cd	Ge	Ga	Y	Y	1.878	0.881	Be	Mg	Sn	Zr	Ga	Ga	In	In	2.511	0.974	Be	Mg	Cd	Cd	Si	Si	Sn	Hf	2.924	0.757	Ca	Sr	Ba	Ba	Ge	Sn	Sn	Zr	3.482	0.615	
Mg	Mg	Ge	Sn	Al	In	In	Sc	1.879	0.712	Be	Zn	Si	Zr	Al	In	In	In	2.511	0.804	Mg	Ba	Cd	Cd	Si	Ti	Ti	Zr	2.924	0.942	Be	Zn	Si	Zr	In	Sc	Sc	Sc	3.482	0.624	
Sr	Ba	Ge	Sn	Ga	Y	Y	Y	1.879	0.851	Mg	Ba	Ba	Cd	Ge	Ge	Sn	Hf	2.511	1.062	Be	Cd	Zr	Zr	Ga	Ga	In	Sc	2.924	0.915	Be	Ge	Zn	Ti	In	Sc	Sc	Y	3.482	0.952	
Be	Sr	Ge	Zr	Ga	Ga	In	In	1.879	0.869	Be	Ba	Si	Si	In	Sc	Y	Y	2.511	0.909	Ca	Ca	Ba	Cd	Ge	Ti	Ti	Zr	2.924	0.822	Be	Mg	Ca	Zn	Si	Zr	Zr	Zr	3.482	0.619	
Cd	Cd	Si	Sn	Al	In	Sc	Sc	1.879	0.695	Ca	Zn	Hf	Hf	Al	Ga	In	Y	2.511	1.027	Mg	Mg	Sn	Cd	Sn	Al	Sc	Y	2.924	0.596	Mg	Mg	Mg	Ba	Ge	Sn	Ti	Hf	3.482	0.637	
Zn	Zn	Sn	Zr	Al	Ga	In	In	1.879	1.033	Be	Sr	Zn	Ti	Ti	Ga	Ga	In	Y	2.511	1.286	Be	Be	Ba	Zn	Ge	Sn	Hf	Hf	2.924	0.728	Be	Sr	Ba	Ba	Ge	Sn	Ti	Ti	3.482	0.766
Ca	Ca	Sn	Zr	Al	Ga	In	In	1.879	1.031	Sr	Zn	Cd	Cd	Si	Si	Ge	Ti	2.511	1.027	Ca	Cd	Si	Hf	Ga	Y	Y	Y	2.924	0.749	Be	Mg	Ca	Zn	Ge	Ge	Hf	Hf	3.483	0.803	
Be	Zn	Sn	Al	Al	In	Y	Y	1.879	0.647	Ba	Cd	Zr	Hf	Ga	Ga	Ga	Sc	2.511	1.067	Be	Mg	Sr	Cd	Si	Hf	Hf	Hf	2.924	0.660	Be	Be	Mg	Sr	Ge	Ti	Hf	Hf	3.483	0.800	
Ba	Zn	Zn	Cd	Sn	Sn	Zr	Hf	1.879	0.803	Be	Ba	Si	Si	In	Sc	Sc	Y	2.511	1.362	Be	Ca	Sr	Cd	Sn	Ti	Ti	Ti	2.924	0.841	Mg	Ca	Zn	Zn	Sn	Ti	Ti	Hf	3.483	0.986	
Sr	Sr	Ge	Ti	In	In	Sc	Y	1.880	0.811	Be	Ca	Ba	Cd	Sn	Sn	Ti	Ti	2.511	0.789	Be	Be	Be	Zn	Si	Ge	Sn	Zr	2.924	0.841	Mg	Sr	Sr	Ba	Sn	Ti	Ti	Hf	3.483	0.819	
Ca	Zn	Si	Sn	Al	Ga	Ga	Ga	1.880	0.922	Ba	Zn	Ge	Zr	In	Sc	Sc	Sc	2.512	0.786	Ca	Ca	Sr	Zn	Ge	Sn	Sn	Hf	2.924	0.654	Be	Cd	Ti	Ti	Al	Al	Ga	Sc	3.483	0.808	
Mg	Cd	Sn	Sn	In	Sc	Sc	Y	1.880	0.790	Mg	Sr	Zr	Hf	In	Y	Y	Y	2.512	0.868	Be	Be	Ge	Sn	Al	In	Sc	Sc	2.924	0.870	Ca	Sr	Ba	Ba	Sn	Ti	Ti	Hf	3.483	0.984	
Sr	Cd	Si	Si	Al	In	In	Sc	1.880	0.799	Zn	Zn	Ti	Zr	Ga	In	In	Y	2.512	1.015	Be	Ba	Zr	Hf	Al	Al	Al	Ga	2.924	0.984	Sr	Sr	Ba	Ba	Si	Ge	Sn	Hf	3.484	0.820	
Sr	Ba	Ge	Sn	Al	Al	Sc	Sc	1.880	0.906	Ca	Ca	Sn	Zr	Ga	Sc	Sc	Y	2.512	0.974	Ca	Cd	Ti	Hf	Al	Al	Al	In	2.924	0.692	Mg	Zn	Zr	Zr	Al	Ga	Ga	Sc	3.484	0.803	
Ca	Ba	Sn	Zr	Al	Ga	Ga	Ga	1.880	0.960	Mg	Cd	Si	Si	Al	In	In	Sc	2.512	0.869	Be	Ca	Sr	Zr	Zr	Al	Ga	Sc	Sc	2.925	0.976	Be	Be	Sr	Si	Ti	Zr	Hf	Hf	3.484	0.754
Cd	Cd	Ge	Hf	In	In	Sc	Y	1.880	0.957	Ca	Zn	Sn	Zr	In	Y	Y	Y	2.512	1.172	Mg	Mg	Sn	Zr	In	Sc	Sc	Y	2.925	1.090	Be	Zn	Si	Hf	Al	Al	In	Al	3.484	0.790	
Be	Sr	Ge	Ge	Al	In	Sc	Sc	1.880	0.879	Zn	Cd	Zr	Zr	Ga	In	In	Sc	2.512	1.043	Be	Be	Sr	Ba	Ge	Ge	Sn	Zr	2.925	0.619	Mg	Ca	Zn	Cd	Zr	Zr	Hf	Hf	3.484	0.761	
Sr	Zn	Sn	Sn	Al	Sc	Sc	Y	1.881	0.852	Zn	Zn	Si	Zr	Al	In	Y	Y	2.512	0.917	Ca	Zn	Si	Ti	Al	Al	Y	Y	2.925	0.738	Mg	Ca	Zn	Zn	Ge	Zr	Zr	Hf	3.484	0.959	
Ca	Ca	Sn	Ti	Ga	In	In	Sc	1.881	0.846	Ca	Ba	Si	Si	Ga	Ga	Sc	Y	2.512	0.909	Ca	Ca	Sr	Zn	Sn	Zn	Hf	2.925	0.759	Ca	Sr	Ba	Sn	Ti	Ti	Zr	Zr	3.485	0.799		
Sr	Zn	Cd	Cd	Ge	Ge	Sn	Zr	1.881	0.703	Ba	Cd	Zn	Ti	Ga	Sc	Sc	Sc	2.512	0.836	Mg	Sr	Cd	Cd	Ge	Ti	Ti	Hf	2.925	1.313	Be	Be	Ca	Ba	Ge	Ti	Ti	Zr	3.485	0.752	
Mg	Cd	Ge	Ti	Al	In	In	Sc	1.881	0.595	Ba	Zn	Ti	Hf	Al	Ga	Ga	Ga	2.512	0.901	Mg	Zn	Si	Hf	Ga	Ga	Ga	Y	2.925	1.201	Be	Mg	Zn	Zn	Sn	Ti	Hf	Hf	3.485	0.978	
Ca	Cd	Si	Sn	Ga	Ga	Sc	Sc	1.881	0.515	Be	Zn	Cd	Cd	Ge	Sn	Sn	Hf	2.512	1.034	Ca	Ca	Sr	Zn	Ge	Sn	Hf	Hf	2.925	1.047	Mg	Mg	Ti	Hf	Al	Al	Ga	In	3.485	0.820	
Be	Ba	Si	Zr	Ga	Ga	In	In	1.881	0.388	Sr	Sr	Zr	Hf	Al	Ga	Ga	In	2.512	0.908	Be	Ca	Hf	Hf	Al	In	Sc	Sc	2.925	1.548	Mg	Mg	Zr	Hf	Al	Al	Ga	In	3.485	0.731	
Sr	Sr	Sn	Zr	Ga	Ga	Sc	Y	1.881	0.523	Mg	Ca	Sn	Hf	Al	Al	Al	In	2.512	0.990	Be	Ba	Zn	Cd	Ge	Ge	Hf	Hf	2.925	1.396	Be	Mg	Mg	Cd	Ge	Ti	Ti	Zr	3.485	0.960	
Sr	Sr	Sn	Zr	Al	Al	In	Sc	1.881	0.510	Ca	Ca	Si	Ge	In	Sc	Y	Y	2.512	1.197	Mg	Ca	Si	Si	Al	Al	Ga	In	2.925	1.133	Mg	Mg	Sr	Zn	Zn	Zr	Zr	Hf	3.485	0.819	
Ca	Sr	Si	Sn	Al	Al	Al	In	1.882	0.376	Mg	Sr	Si	Zr	Al	Al	In	Y	2.512	1.092	Mg	Mg	Sr	Zn	Ge	Sn	Sn	Hf	2.925	0.860	Be	Be	Mg	Zn	Si	Ti	Zr	Zr	3.485	0.824	
Ca	Sr	Cd	Cd	Ge	Sn	Sn	Hf	1.882	0.472	Mg	Mg	Sn	Hf	Al	Ga	Ga	Y	2.512	1.062	Be	Zn	Sn	Ti	Al	Ga	Ga	Ga	2.925	0.997	Be	Mg	Sn	Hf	Al	Al	Al	Sc	3.486	1.014	
Be	Mg	Si	Sn	In	In	Y	Y	1.882	0.476	Mg	Mg	Si	Si	Ge	Ga	Ga	Y	2.513	0.963	Zn	Cd	Si	Ge	Al	Al	Al	Y	2.925	0.969	Ca	Sr	Sr	Ba	Si	Sn	Sn	Hf	3.486	0.839	
Be	Sr	Si</																																						

Sr	Ba	Sn	Ti	Al	Al	In	In	1.894	0.722	Be	Ca	Cd	Cd	Sn	Sn	Ti	HF	2.518	0.898	Be	Ca	Ti	Ti	Al	Ga	Y	Y	2.931	0.806	Mg	Sr	Sr	Ba	Sn	Zr	Zr	HF	3.497	1.119	
Zn	Cd	Ge	Sn	Ga	In	Y	Y	1.894	0.735	Be	Mg	Ge	Ge	Al	In	In	Sc	2.518	0.895	Ba	Ba	Si	Ti	In	Sc	Y	Y	2.931	0.742	Be	Cd	Si	Si	Al	Al	Ga	Sc	3.497	1.022	
Ca	Sr	Sn	Ti	Ga	In	Y	Y	1.894	0.459	Zn	Zn	Zr	Ti	Ga	Ga	In	Sc	2.518	0.825	Ba	Ca	Ti	Ti	In	Sc	Sc	Y	2.931	1.025	Ba	Zn	HF	HF	Al	Al	Ga	Sc	3.497	1.141	
Be	Zn	Ge	Sn	Ga	Ga	Y	Y	1.895	0.694	Mg	Sr	Si	HF	Ga	Ga	Y	Y	2.518	0.982	Sr	Ba	Si	Zr	Ga	Y	Y	2.931	0.952	Be	Zn	Ti	HF	Sc	Sc	Sc	Y	3.497	1.178		
Cd	Cd	Ge	Ti	Ti	Al	Ga	In	Sc	1.895	0.704	Ca	Ba	Ti	Ti	Al	Ga	In	2.518	1.369	Mg	Zn	Ge	Sn	Sc	Sc	Sc	Y	2.931	0.814	Be	Be	Mg	Zn	Si	Si	Sn	Ti	3.497	1.100	
Ba	Cd	Ti	Zr	Al	In	In	In	Sc	1.895	0.415	Mg	Ca	Cd	Cd	Si	Si	Ge	Sn	2.518	1.259	Be	Ba	Cd	Cd	Ge	Ti	Ti	HF	2.931	0.636	Mg	Ca	Zn	Zn	Si	Ti	Zr	Zr	3.498	1.367
Ca	Sr	Sn	Ti	In	In	In	Sc	Sc	1.895	0.688	Ca	Ba	Sr	Cd	Si	Ge	Zr	Zr	2.518	1.236	Ca	Ba	Ti	Zr	Al	Al	Y	2.932	0.790	Be	Be	Si	Si	Al	In	Sc	Y	3.498	1.097	
Ba	Zn	Zn	Cd	Ge	Sn	Sn	Ti	1.895	0.699	Sr	Sr	Zn	Cd	Ge	Zr	HF	HF	2.518	0.887	Mg	Zn	Si	Sn	Ga	Sc	Sc	Sc	2.932	0.768	Mg	Mg	Ti	Zr	Al	Al	In	Sc	3.499	0.907	
Ca	Zn	Ge	Sn	Al	Al	Y	Y	1.895	0.498	Cd	Cd	Zr	Si	Zr	Al	Al	In	Sc	2.519	0.882	Cd	Cd	Si	HF	Al	Sc	Y	Y	2.932	0.653	Ca	Sr	Sr	Ba	Sn	Ti	Ti	HF	3.499	0.844
Be	Sr	Sn	HF	Ga	Ga	Y	Y	1.895	0.665	Be	Zn	Zr	HF	Ga	In	In	Sc	2.519	1.116	Be	Sr	Ba	Zn	Si	Si	Ge	Ge	2.932	0.900	Be	Zn	Ge	Zr	Al	Sc	Sc	Sc	3.499	0.659	
Sr	Sr	Si	Sn	Al	Ga	Y	Y	1.896	0.620	Sr	Cd	Zr	Zr	Ga	Ga	Sc	Y	2.519	1.001	Sr	Cd	HF	HF	Al	Sc	Sc	Y	2.932	0.877	Mg	Zn	Ti	HF	Sc	Y	Y	Y	3.499	0.658	
Ba	Cd	Si	Ge	Ga	Ga	Sc	Sc	1.896	0.331	Sr	Sr	Ba	Cd	Si	Sn	Ti	Ti	2.519	0.926	Ca	Sr	Ba	Cd	Si	Si	Si	Ge	2.932	1.052	Be	Ca	Zn	Zn	Ge	Zr	Zr	HF	3.499	0.612	
Zn	Cd	Si	Zr	Al	In	In	In	Sc	1.896	0.663	Ba	Ba	Si	Ge	Al	Sc	Sc	Y	2.519	1.180	Be	Ca	Si	Ti	Ga	Y	Y	2.932	1.034	Mg	Cd	Si	Zr	Ga	Sc	Sc	Sc	3.499	0.840	
Mg	Sr	Sn	Ti	In	In	In	Sc	Sc	1.896	0.614	Sr	Sr	Sn	HF	Al	Y	Y	2.519	0.963	Be	Sr	Ge	Ti	Al	Al	Al	Sc	2.932	0.951	Ca	Ca	Ba	Ba	Ge	Sn	Ti	HF	3.499	0.654	
Mg	Zn	Ge	Ge	Ga	In	In	Sc	1.896	0.317	Mg	Cd	Si	HF	Ga	Ga	Ga	In	2.519	1.136	Be	Ca	Ba	Cd	Ti	Ti	Ti	Zr	2.932	0.652	Be	Mg	Si	Ti	Ga	Ga	Y	Y	3.499	0.617	
Be	Sr	Sn	Zr	Ga	Ga	Y	Y	1.896	0.886	Be	Ba	Ge	Zr	Al	Y	Y	Y	2.519	1.382	Be	Ba	Ba	Zn	Sn	Ti	Ti	Zr	2.932	0.841	Be	Be	Zn	Zn	Y	Sc	Ti	HF	3.499	0.716	
Mg	Zn	Ge	Ge	Ga	Ga	In	Y	1.896	0.879	Mg	Sr	Sn	HF	Al	Y	Y	Y	2.519	1.052	Ca	Ca	Ba	Zn	Ge	Sn	Zr	Zr	2.932	0.878	Mg	Cd	Si	Zr	Sc	Y	Y	Y	3.500	0.876	
Ca	Zn	Si	Zr	In	In	In	Y	1.896	0.356	Ca	Zn	HF	HF	In	In	Sc	Y	2.519	1.175	Ca	Ba	Ti	Zr	Al	Al	Al	Sc	2.932	0.684	Be	Be	Ca	Sr	Sn	Ti	HF	HF	3.500	0.782	
Mg	Zn	Sn	HF	In	In	In	Y	1.897	0.742	Sr	Cd	Si	Ge	Al	Al	Al	Sc	2.519	1.463	Be	Mg	Sr	Cd	Ge	Zr	Zr	Zr	2.932	0.945	Mg	Mg	Mg	Ba	Ge	Sn	Ti	Zr	3.500	0.912	
Ca	Sr	Zn	Cd	Sn	Sn	HF	HF	1.897	0.699	Ba	Cd	Si	Si	In	Sc	Y	Y	2.519	0.832	Be	Ba	Zn	Cd	Cd	Ge	Zr	Zr	2.932	0.976	Be	Be	Ge	Zr	Al	Sc	Sc	Y	3.500	0.886	
Be	Zn	Ge	Ge	Ga	In	In	Y	1.897	0.780	Be	Ca	Ge	Ti	Al	Al	In	In	2.519	0.856	Sr	Cd	Ti	HF	Al	Al	Al	Sc	2.932	0.714	Be	Mg	Sn	HF	Al	Al	Al	Ga	3.500	0.782	
Be	Sr	Sn	Ti	Al	Al	In	In	1.897	0.739	Be	Sr	Ti	Zr	Al	Al	In	In	2.519	0.943	Sr	Zn	Si	HF	Al	Al	Y	Y	2.932	0.977	Mg	Mg	Sr	Zn	Si	Zr	Zr	HF	3.500	0.816	
Ca	Sr	Si	Zr	In	In	In	Y	1.897	0.692	Mg	Cd	HF	HF	Ga	In	In	Y	2.519	1.115	Be	Be	Ca	Cd	Si	Si	Ge	HF	2.932	1.099	Ca	Sr	Sr	Ba	Ge	Sn	Ti	Ti	3.500	0.676	
Be	Sr	Si	Ti	Ga	Ga	In	In	1.897	0.768	Sr	Cd	Si	Zr	Al	Al	Al	In	2.519	1.055	Be	Be	Ca	Cd	Sn	Ti	Ti	HF	HF	2.932	0.719	Ca	Sr	Sr	Ba	Sn	Ti	Ti	Zr	3.500	0.653
Ca	Cd	Ge	Ge	Al	Al	Ga	Y	1.897	0.940	Mg	Zn	Si	Sn	Ga	Ga	Sc	Sc	2.520	0.960	Zn	Cd	Ge	HF	Sc	Y	Y	Y	2.933	1.074	Mg	Mg	Si	Zr	Al	Ga	Sc	Sc	3.501	0.737	
Sr	Zn	Ge	Sn	Ga	Y	Y	Y	1.898	0.934	Sr	Zn	Si	Ti	HF	Ga	In	In	2.520	1.263	Be	Ca	Cd	Cd	Sn	Ti	Ti	HF	HF	2.933	1.211	Be	Cd	Ti	HF	Ga	Ga	In	Sc	3.501	0.893
Ba	Ba	Ge	Sn	Al	Al	Sc	Sc	Y	1.898	0.810	Ca	Ba	HF	HF	Al	Ga	Ga	Y	2.520	1.125	Sr	Cd	Zr	HF	In	Sc	Sc	Sc	2.933	0.654	Be	Be	Sr	Sr	Ge	Ti	Zr	HF	3.501	0.827
Be	Ba	Si	HF	In	In	Y	Y	1.898	0.837	Sr	Sr	Sr	Cd	Ge	Sn	Ti	HF	2.520	1.015	Sr	Sr	Ti	Zr	Ga	Sc	Y	Y	2.933	0.796	Be	Ca	Sr	Sr	Ge	Ti	Zr	HF	3.501	0.920	
Ba	Cd	Ge	Zr	Ga	Ga	Sc	Sc	1.898	0.826	Mg	Sr	Cd	Zr	Al	Al	Al	In	2.520	0.961	Sr	Zn	Ti	Ti	Al	Al	Sc	Y	2.933	0.831	Mg	Sr	Sr	Ba	Si	Sn	Zr	Zr	3.501	0.896	
Sr	Zn	Zn	Cd	Ge	Ge	Sn	HF	1.898	0.650	Mg	Cd	Sn	HF	Al	Al	Al	In	2.520	0.932	Ca	Ba	Si	Ge	Sc	Y	Y	Y	2.933	1.034	Be	Ca	Ba	Ba	Si	Sn	Zr	Zr	3.501	0.811	
Ca	Ca	Ge	Ti	Al	In	In	Y	1.898	0.703	Mg	Ca	Ti	Ti	Ga	In	In	Y	2.520	0.999	Mg	Ca	Sn	Ti	Al	Al	Sc	Sc	2.933	0.934	Be	Mg	Ba	Si	Si	Ge	Ge	HF	3.501	0.848	
Sr	Ba	Zn	Zr	Si	Ge	Sn	Sn	1.898	0.589	Mg	Zn	Ti	HF	In	In	Y	Y	2.520	1.058	Be	Cd	Sn	Ti	Ge	Al	Y	Y	Y	2.933	0.825	Be	Ca	Ba	Si	Sn	HF	HF	3.502	0.714	
Sr	Ba	Ge	Zr	In	In	Y	Y	1.899	0.475	Sr	Cd	HF	HF	Ga	In	Sc	Sc	2.520	1.003	Mg	Ba	Zr	HF	Sc	Y	Y	Y	2.933	1.219	Ca	Ca	Sr	Zn	Si	Ge	Ti	Ti	3.502	0.676	
Cd	Cd	Ge	Ti	Ga	Ga	In	Y	1.899	0.695	Ca	Ba	Zr	HF	Ga	Ga	In	In	2.521	1.092	Be	Ca	Ba	Cd	Sn	Sn	Ti	Ti	2.933	1.103	Ca	Ca	Sr	Sr	Si	Ge	Sn	Zr	3.502	0.871	
Sr	Cd	Si	Sn	Al	Al	Y	Y	1.899	0.601	Be	Zn	HF	HF	Ga	In	Y	Y	2.521	1.280	Mg	Mg	Zn	Cd	Ge	Ge	Zr	HF	2.933	0.900	Mg	Zn	Ge	Ti	Sc	Sc	Y	Y	3.502	0.757	
Sr	Zn	Cd	Cd	Si	Sn	Sn	Ti	1.899	0.482	Ca	Sr	Zn	Cd	Si	Si	Ge	Ge	2.521	1.185	Be	Mg	Ba	Cd	Ti	Ti	Zr	Zr	2.933	0.642	Mg	Mg	Mg	Sr	Si	Sn	Zr	HF	3.502	0.851	
Sr	Sr	Sn	HF	Al	Ga	Ga	Y	1.899	0.724	Ca	Sr	Ti	HF	Ga	Ga	Ga	Y	2.521	1.160	Mg	Sr	Sr	Zn	Ge	Sn	Sn	Ti	2.933	0.819	Mg	Cd	Si	HF	Al	Al	Al	Sc	3.502	1.127	
Ca	Ca	Sn	HF	Al	Ga	Ga	In	1.899	0.596	Ca	Ba	Ti	HF	Ga	Ga	Ga	In	2.521	1.005	Ca	Sr	Si	HF	Ga	Y	Y	Y	2.933	0.795	Mg	Sr	Sr	Zn	Si	Si	Ge	Ti	3.502	0.941	
Sr	Sr	Ge	Ti	Ga	Ga	In	Y	1.899	0.478	Ca	Cd	Ti	HF	In	In	Sc	Sc	2.521	0.970	Be	Ba	Zn	Zn	Ge	Ge	Sn	Zr	2.933	0.650	Mg	Ca	Zn	Zn	Sn	Ti	Ti	Zr	3.502	0.926	
Ca	Ba	Cd	Cd	Si	Sn	Zr	Zr	1.899	0.727	Sr	Cd	Zr	Zr	Al	Al	Ga	In	2.521	1.101	Be	Ca	Ti	Zr	Al	Y	Y	Y	2.933	0.931	Mg	Mg	Sr	Ba	Sn	Sn	Ti	Zr	3.503	0.843	
Sr	Sr	Ge	Zr	Al	Ga	Zr	In	1.899	0.594	Sr	Sr	Si	HF	Al	Ga	Y	Y	2.521	1.129	Be	Mg	Ti	Zr	Ga	In	In	In	2.933	0.892	Be	Be	Sr	Sr	Ge	Sn	Zr	HF	3.503	0.764	
Cd	Ba	Ge	Ti	Ga	Ga	In	Y	1.900	0.478	Be	Sr	Ti	Zr	Ga	Ga	Y	Y	2.521	1.035	Zn	Cd	Cd	Cd	Si	Ge	Zr	HF	2.933	1.267	Ca	Ca	Ba	Si	Ge	Zr	HF	3.503	0.767		
Cd	Cd	Ge	Ti	Al	Ga	Ga	In	1.900	0.977	Sr	Cd	Zr	HF	Al	Ga	Ga	Ga	2.521	1.176	Ca	Zn	Ge	HF	Ga	Ga	Sc	Sc	2.933	1.243	Be	Be	Si	HF	Al	In	Sc	Sc	3.503	1.009	
Zn	Cd	Ge	Ge	Al	Ga	Ga	Y	1.900	0.961	Be	Sr	Zr	Ge	Al	In	In	Sc	2.521	1.077	Ca	Zn	Ti	HF	Ga	Ga	Sc	Sc	2.933	1.139	Be	Mg	Sr	Cd	Si	Si	Si	Ti	3.503	0.749	
Be	Ba	Sn	HF	In	Y	Y	Y	1.900	0.584	Be	Sr	Ge	Zr	Al	Al	Al	In	2.521	1.202	Mg	Ca	Zr	Zr	Ga	Ga	In	Sc	Sc	2.934	0.686	Ca	Ca	Sr	Ba	Si	Ti	HF	HF	3.503	0.762
Ba	C																																							

Sr	Zn	Ge	Ti	Ga	Ga	In	1914	0.988	Mg	Ca	Sn	Zr	Al	Al	Al	Y	2.527	1.083	Mg	Cd	Sn	Hf	Sc	Sc	Sc	Y	2.939	0.649	Be	Ca	Ti	Zr	Al	Al	Al	Ga	3.515	1.185		
Be	Ba	Sn	Hf	Ga	Ga	Sc	1914	0.827	Be	Ba	Hf	Hf	Ga	Sc	Sc	Y	2.527	1.112	Be	Zn	Sn	Zr	Ga	Ga	Sc	Y	2.939	0.660	Be	Be	Ca	Zn	Si	Si	Zr	Hf	3.515	1.029		
Mg	Ba	Ge	Sn	Al	Al	Sc	1915	0.759	Be	Ca	Ca	Cd	Si	Ge	Ge	Sn	2.528	1.212	Zn	Cd	Zr	Zr	Ga	Sc	Sc	Y	2.939	0.809	Mg	Sr	Zn	Zn	Si	Si	Zr	Hf	3.515	0.570		
Be	Mg	Sn	Sn	In	In	Sc	1915	0.800	Sr	Ba	Cd	Cd	Si	Zr	Zr	Hf	2.528	1.177	Mg	Sr	Ti	Ti	Ga	Sc	Sc	Y	2.939	0.709	Be	Mg	Cd	Cd	Si	Si	Ge	Ti	3.516	0.966		
Ca	Sr	Ge	Zr	In	In	Y	1915	0.802	Ca	Ca	Ge	Ti	Al	Ga	Y	Y	2.528	1.176	Sr	Ba	Ba	Zn	Si	Si	Zr	Hf	2.939	0.969	Ca	Sr	Sr	Ba	Ge	Sn	Sn	Ti	3.516	0.814		
Be	Cd	Ti	Ti	In	In	Y	1915	0.733	Mg	Ba	Ge	Zr	In	Sc	Sc	Sc	2.528	1.278	Ba	Ba	Ti	Hf	Al	Al	Sc	Y	2.939	0.942	Be	Be	Ca	Ba	Ge	Sn	Hf	Hf	3.516	0.573		
Ca	Cd	Ge	Sn	Al	Al	Y	1915	0.786	Mg	Ba	Ba	Cd	Ge	Ge	Sn	Zr	2.528	1.141	Mg	Cd	Ti	Zr	In	Y	Y	Y	2.939	0.825	Mg	Mg	Sr	Ba	Sn	Zr	Zr	Hf	3.516	1.018		
Ca	Ca	Sn	Hf	Ga	Ga	In	Sc	0.783	Be	Be	Ge	Zr	Ga	In	Y	Y	2.528	1.314	Mg	Mg	Ge	Ti	Al	Al	In	Y	2.939	0.626	Be	Be	Zr	Hf	Al	Al	In	Sc	3.516	0.868		
Ba	Ba	Cd	Cd	Si	Ge	Ti	Zr	0.790	Be	Zn	Sn	Zr	Ga	Ga	In	Y	2.528	1.441	Be	Mg	Ge	Sn	Al	Al	In	Y	2.939	0.713	Be	Mg	Ge	Ti	Al	Ga	Ga	Ga	3.516	0.703		
Sr	Zn	Ge	Ti	Ga	Ga	Y	1915	0.798	Ca	Sr	Sr	Cd	Sn	Sn	Ti	Hf	2.528	1.211	Be	Ca	Sr	Cd	Si	Si	Hf	Hf	2.940	0.727	Be	Sr	Ba	Ba	Ge	Sn	Zr	Zr	3.516	1.099		
Ca	Cd	Si	Ge	Al	Ga	Ga	1916	0.742	Cd	Cd	Zr	Zr	Al	In	Sc	Y	2.528	1.373	Be	Be	Be	Be	Ge	Sn	Zr	Hf	2.940	0.682	Mg	Ca	Ti	Zr	Al	Al	Al	Sc	3.516	0.808		
Sr	Zn	Sn	Zr	Al	Al	Y	1916	0.851	Be	Mg	Sn	Sn	Al	Ga	Sc	Sc	2.528	1.523	Mg	Sr	Ge	Hf	Sc	Y	Y	Y	2.940	0.801	Mg	Ca	Ca	Zn	Sn	Zr	Zr	Hf	3.516	0.720		
Sr	Ba	Ge	Sn	Al	Al	Y	1916	0.889	Mg	Zn	Sn	Hf	Al	Ga	Ga	Ga	2.528	1.054	Mg	Ca	Ca	Cd	Si	Sn	Ti	Ti	2.940	0.775	Mg	Mg	Mg	Sr	Si	Ge	Sn	Ti	3.516	1.168		
Zn	Zn	Si	Ge	Al	In	In	Y	1916	1.087	Mg	Ba	Ti	Zr	Ga	In	Sc	Sc	2.528	1.118	Mg	Cd	Sn	Hf	Sc	Y	Y	Y	2.940	0.645	Be	Mg	Sn	Ti	Al	Al	Al	In	3.516	0.861	
Mg	Ca	Ba	Cd	Ge	Sn	Sn	1916	0.826	Ba	Ba	Hf	Hf	Al	Ga	Sc	Y	2.528	1.181	Mg	Mg	Sn	Ti	In	Sc	Y	Y	2.940	0.818	Mg	Ca	Sr	Sr	Ge	Sn	Sn	Hf	3.517	0.407		
Mg	Mg	Si	Sn	Ga	In	Y	1917	0.876	Mg	Sr	Ti	Ti	Ga	Ga	In	Y	2.528	1.238	Mg	Sr	Sr	Cd	Si	Ti	Ti	Zr	2.940	0.948	Mg	Zn	Zn	Cd	Si	Si	Ti	Zr	3.517	0.495		
Ca	Ba	Ge	Hf	Ga	Ga	In	1917	1.069	Be	Mg	Ca	Cd	Si	Si	Sn	Sn	2.528	1.167	Be	Be	Mg	Cd	Sn	Zr	Hf	Hf	2.940	0.677	Mg	Ca	Ca	Zn	Sn	Ti	Zr	Zr	3.517	0.480		
Be	Ca	Zn	Cd	Ge	Sn	Sn	1917	0.866	Zn	Cd	Ge	Hf	In	Y	Y	Y	2.528	1.090	Be	Cd	Zr	Zr	Ga	In	Sc	Sc	2.940	0.900	Be	Mg	Ba	Ba	Sn	Sn	Zr	Hf	3.517	0.815		
Ca	Cd	Ge	Hf	In	In	Sc	1917	0.875	Ca	Cd	Sn	Ti	In	Y	Y	Y	2.529	1.372	Be	Sn	Sn	Hf	Ga	Ga	In	Sc	2.940	1.009	Be	Mg	Mg	Cd	Si	Ti	Ti	Hf	3.517	1.189		
Ca	Ba	Si	Sn	Al	Al	Sc	1917	1.025	Mg	Ca	Ge	Ti	Ga	Ga	Y	Y	2.529	1.241	Be	Cd	Cd	Cd	Ge	Sn	Zr	Hf	2.940	0.591	Be	Mg	Ge	Zr	Al	Al	Sc	Sc	3.517	1.033		
Sr	Zn	Ge	Hf	Al	Ga	Ga	1917	0.657	Ca	Ca	Zn	Cd	Sn	Ti	Hf	Hf	2.529	1.140	Zn	Zn	Ge	Ti	Ga	Sc	Y	Y	2.940	0.696	Be	Be	Mg	Cd	Si	Si	Ti	Hf	3.517	0.829		
Ca	Zn	Ge	Hf	Ga	Ga	Y	1917	0.658	Be	Ca	Cd	Cd	Sn	Sn	Ti	Zr	2.529	1.073	Be	Cd	Si	Hf	Ga	Ga	Ga	Y	2.940	0.700	Be	Zn	Ti	Zr	Ga	Sc	Sc	Sc	3.517	1.255		
Be	Ba	Si	Si	Ga	In	In	Sc	1917	0.622	Mg	Cd	Ge	Ge	Al	Al	Ga	Sc	2.529	1.092	Mg	Sr	Cd	Cd	Si	Si	Ge	Ti	2.940	0.813	Ca	Ba	Ba	Si	Sn	Ti	Zr	Zr	3.517	1.080	
Mg	Sr	Ge	Sn	Al	Al	Y	1917	0.250	Be	Ca	Si	Sn	Al	Al	Y	Y	2.529	1.131	Be	Be	Mg	Cd	Si	Sn	Zr	Zr	2.940	0.781	Mg	Ca	Ba	Si	Sn	Ti	Hf	3.517	0.551			
Sr	Ba	Zn	Cd	Ge	Hf	Hf	1917	0.197	Mg	Sr	Sr	Cd	Sn	Sn	Ti	Hf	2.529	1.140	Ba	Cd	Ti	Zr	Al	Al	Y	Y	Y	2.940	0.701	Mg	Mg	Ti	Zr	Al	Al	Ga	Y	3.517	0.639	
Cd	Cd	Ge	Sn	Ge	Al	Al	Y	1918	0.104	Mg	Zn	Ti	Hf	Ga	In	In	2.529	1.164	Ca	Cd	Zr	Zr	Ga	Sc	Y	Y	2.940	0.961	Be	Mg	Zr	Hf	Ga	Sc	Sc	Sc	3.517	0.723		
Cd	Cd	Ge	Hf	Ga	Ga	In	Sc	1918	0.529	Ca	Sr	Sn	Ti	In	Sc	Sc	Sc	2.529	1.216	Sr	Sr	Sr	Zn	Si	Ge	Sn	Ti	2.940	0.916	Be	Zn	Cd	Cd	Si	Ge	Ti	Ti	3.517	0.601	
Ca	Zn	Sn	Sn	Ga	Sc	Sc	Y	1918	0.432	Be	Sr	Sn	Zr	In	Sc	Sc	Sc	Y	2.529	1.376	Be	Zn	Si	Hf	In	In	Sc	Sc	2.941	0.729	Be	Mg	Si	Hf	Sc	Y	Y	Y	3.518	0.706
Sr	Sr	Ge	Hf	Al	Al	In	Y	1918	0.333	Ca	Ba	Cd	Cd	Sn	Ti	Ti	Zr	2.529	1.298	Mg	Ca	Ti	Zr	Ga	Ga	Ga	Y	2.941	0.640	Mg	Mg	Ba	Zn	Si	Ti	Ti	Hf	3.518	1.003	
Mg	Zn	Sn	Zr	Al	In	In	1918	0.418	Mg	Cd	Ti	Hf	In	In	In	Sc	2.529	1.266	Mg	Ba	Ba	Zn	Ge	Ge	Sn	Hf	2.941	0.733	Ca	Ba	Ba	Ba	Si	Sn	Ti	Hf	3.518	1.583		
Ca	Ca	Ge	Hf	Ga	Ga	In	Y	0.409	Sr	Zn	Zn	Cd	Si	Ti	Zr	Zr	2.530	1.104	Mg	Zn	Ge	Sn	Al	Sc	Sc	Sc	2.941	0.668	Mg	Mg	Ba	Zn	Ge	Ge	Ti	Zr	3.518	1.559		
Ba	Ba	Si	Ti	Ga	Ga	In	In	1919	0.311	Be	Ba	Ge	Hf	Al	Al	Sc	Sc	2.530	1.019	Be	Cd	Sn	Ti	Sc	Y	Y	Y	2.941	0.674	Be	Mg	Ge	Sr	Si	Ge	Ge	Sn	3.518	1.409	
Zn	Cd	Ge	Sn	Al	Al	Y	Y	1919	0.392	Mg	Zn	Ge	Ge	Al	Al	In	Sc	2.530	1.214	Mg	Ba	Cd	Cd	Si	Zr	Zr	Hf	2.941	0.824	Be	Zn	Si	Ge	Al	Al	Sc	Sc	3.518	1.039	
Mg	Ba	Ge	Hf	Ga	Ga	Ga	In	1919	0.403	Mg	Mg	Ge	Ti	Ga	In	Y	Y	2.530	1.199	Be	Be	Sr	Cd	Si	Ge	Zr	Zr	2.941	0.728	Ca	Sr	Sr	Ba	Si	Zr	Hf	Hf	3.518	1.368	
Ca	Ca	Ge	Sn	In	Sc	Y	Y	1920	0.304	Mg	Mg	Ge	Hf	Al	Ga	In	Y	2.530	1.195	Be	Sr	Cd	Cd	Sn	Ti	Ti	Hf	2.941	0.965	Be	Be	Sn	Zr	Al	Al	Ga	Sc	3.518	1.222	
Sr	Cd	Si	Hf	Ga	Ga	Ga	In	1920	0.663	Zn	Zn	Si	Ge	In	Sc	Y	Y	2.530	1.281	Mg	Mg	Ca	Cd	Si	Si	Sn	Hf	2.941	0.940	Ca	Ca	Ba	Ba	Si	Ge	Sn	Zr	3.519	1.029	
Zn	Cd	Si	Sn	Ga	Ga	Ga	Sc	1920	0.612	Be	Cd	Si	Ti	Al	In	In	Sc	2.530	1.162	Be	Mg	Si	Si	In	In	Sc	Y	2.942	0.825	Mg	Cd	Ti	Ti	Al	Sc	Sc	Sc	Y	3.519	1.408
Sr	Sr	Si	Ge	Ga	In	Sc	Sc	1920	0.366	Ca	Zn	Ti	Ti	Al	Ga	In	In	2.530	1.327	Be	Mg	Mg	Cd	Si	Sn	Sn	Ti	2.942	0.639	Sr	Sr	Sr	Ba	Si	Ge	Ti	Hf	3.519	1.264	
Sr	Ba	Sn	Hf	Ga	Ga	Y	Y	1921	0.556	Ca	Cd	Ge	Hf	Al	Al	Sc	Sc	2.530	1.441	Be	Mg	Mg	Cd	Al	Ga	In	In	2.942	0.724	Mg	Mg	Sr	Zn	Si	Si	Ge	Zr	3.519	1.149	
Mg	Sr	Si	Zr	In	In	In	Y	1921	0.588	Zn	Zn	Ge	Hf	Al	Ga	Ga	Y	2.530	1.232	Be	Ca	Cd	Cd	Sn	Ti	Zr	Zr	2.942	0.735	Mg	Ca	Sr	Sr	Ge	Sn	Sn	Zr	3.519	1.484	
Sr	Sr	Sn	Ti	Al	Al	Ga	In	1921	0.331	Mg	Ba	Hf	Hf	In	Sc	Y	Y	2.530	1.388	Ca	Ca	Ca	Cd	Si	Ti	Zr	Hf	2.942	0.691	Be	Sr	Zn	Zn	Ge	Sn	Ti	Zr	3.519	1.221	
Ca	Ba	Si	Sn	In	Y	Y	Y	1921	0.530	Ca	Ba	Si	Hf	Ga	Ga	Y	Y	2.530	1.524	Mg	Mg	Mg	Cd	Si	Ge	Sn	Zr	2.942	0.808	Mg	Mg	Ti	Zr	Ga	Sc	Sc	Y	3.520	1.154	
Ba	Zn	Si	Sn	In	Y	Y	Y	1921	0.581	Ba	Zn	Hf	Hf	Al	Al	In	Sc	2.530	1.084	Ba	Zn	Si	Zr	Sc	Sc	Y	Y	2.942	0.783	Be	Ca	Ba	Ba	Sn	Sn	Ti	Zr	3.520	1.543	
Ca	Sr	Cd	Cd	Si	Sn	Hf	Hf	1922	0.323	Ca	Zn	Zn	Cd	Si	Ge	Hf	Hf	2.530	1.150	Sr	Zn	Ti	Hf	Al	Al	Sc	Sc	2.942	0.657	Be	Mg	Ba	Ba	Sn	Zr	Hf	Hf	3.520	1.262	
Ba	Cd	Si	Sn	Al	Al	Al	Ga	1922	0.430	Sr	Ba	Ge	Zr	In	Sc	Sc	Sc	2.530	1.210	Mg	Cd	Hf	Hf	Al	Al	In	Sc	2.942	0.825	Mg	Zn	Ti	Ti	Ga	Sc	Sc	Y	3.520	0.826	
Ba	Ba	Ge	Hf	Ga	Ga	In	Sc	1922	0.447	Ca	Ca	Zn	Cd	Si	Ge	Ge	Ti	2.530	1.066	Zn	Cd	Si	Ge	Sc	Y	Y	Y	2.942	0.951	Be										

Ca	Sr	Zn	Cd	Sn	Sn	Zr	Zr	1933	0.370	Sr	Zn	Zr	Hf	In	In	Sc	Sc	2.536	1.158	Mg	Mg	Si	Sn	Al	Al	Ga	Sc	2.948	0.848	Mg	Ca	Sr	Ba	Sn	Hf	Hf	Hf	3.530	0.674	
Ba	Cd	Si	Zr	Al	Al	In	In	1933	0.607	Sr	Sr	Si	Ti	Ga	In	Sc	Sc	2.536	1.253	Ca	Ba	Ba	Zn	Ge	Ge	Sn	Zr	2.948	0.994	Sr	Ba	Ba	Si	Ge	Sn	Zr	3.530	0.726		
Be	Zn	Ge	Sn	Al	Al	Ga	In	1933	0.615	Mg	Mg	Ge	Sn	Ga	Sc	Sc	Y	2.536	1.227	Mg	Sr	Hf	Hf	Al	Al	Ga	Sc	2.948	1.129	Be	Sr	Zn	Ge	Ti	Zr	Zr	3.530	0.817		
Cd	Cd	Sn	Hf	Ga	Ga	Sc	Y	1934	0.313	Sr	Sr	Ti	Hf	Ga	Ga	In	Sc	2.536	1.221	Be	Sr	Sr	Cd	Si	Si	Ti	Hf	2.948	0.908	Mg	Sr	Sr	Ba	Ge	Sn	Zr	3.530	0.711		
Sr	Zn	Si	Si	Si	Ga	In	In	Sc	1934	0.537	Sr	Ba	Zn	Cd	Ti	Ti	Ti	Hf	2.537	1.285	Be	Be	Ca	Cd	Si	Ti	Hf	2.948	1.076	Be	Zn	Si	Ge	Sc	Sc	Y	3.531	0.793		
Mg	Cd	Ge	Hf	In	In	Y	Y	1934	0.581	Ca	Cd	Si	Hf	Al	Al	Ga	Ga	2.537	1.006	Ca	Ca	Sr	Cd	Sn	Ti	Ti	Hf	2.948	1.174	Be	Mg	Sn	Ti	Al	Ga	Sc	3.531	0.849		
Ca	Ba	Cd	Ge	Sn	Sn	Sn	Ti	1934	0.668	Zn	Cd	Ti	Ti	Al	In	In	Sc	2.537	1.028	Be	Sr	Si	Zr	Ga	Sc	Sc	Sc	2.948	0.939	Mg	Mg	Ca	Sr	Si	Si	Ge	Sn	3.531	0.728	
Ca	Zn	Cd	Cd	Si	Sn	Sn	Hf	1935	0.510	Ca	Cd	Ge	Ge	Al	Al	Sc	Y	2.537	1.036	Ca	Ca	Ba	Zn	Si	Sn	Sn	Ti	2.948	1.206	Mg	Mg	Ba	Ba	Si	Zn	Ge	Hf	3.531	0.725	
Ca	Zn	Zn	Cd	Si	Ge	Sn	Sn	1935	0.566	Sr	Ba	Zr	Zr	Al	Al	In	Y	2.537	1.496	Be	Be	Ge	Hf	Ga	In	In	Sc	2.948	1.447	Mg	Mg	Ca	Zn	Si	Ge	Ge	Hf	3.531	0.718	
Sr	Cd	Ge	Hf	Al	Al	Ga	Ga	1935	0.648	Be	Sr	Ge	Hf	Al	Al	Y	Y	2.537	1.372	Be	Mg	Si	Zr	Ga	Ga	Y	Y	2.948	0.972	Be	Sr	Zn	Cd	Si	Si	Ti	Ti	3.531	0.658	
Ca	Ba	Sn	Ti	Al	Al	In	In	1935	0.633	Mg	Zn	Ge	Zr	Ga	Ga	In	2.537	1.103	Be	Be	Si	Ge	In	Sc	Y	Y	2.948	1.282	Be	Mg	Ti	Zr	Sc	Sc	Y	Y	3.531	0.721		
Be	Ca	Ge	Hf	Ga	In	In	In	1935	0.640	Cd	Cd	Sr	Cd	Sn	Sn	Ti	Zr	2.537	1.668	Zn	Cd	Zr	Hf	Sc	Sc	Y	Y	2.949	1.507	Mg	Ca	Zn	Zn	Si	Si	Ti	Hf	3.531	0.794	
Sr	Zn	Cd	Cd	Si	Si	Sn	Hf	1935	0.589	Sr	Zn	Zn	Cd	Ge	Zr	Hf	Hf	2.537	1.411	Ca	Zn	Ge	Zr	Al	Y	Y	Y	2.949	0.734	Be	Sr	Sr	Ba	Ge	Sn	Zr	Zr	3.531	0.688	
Sr	Zn	Si	Ti	In	In	In	Sc	1935	0.523	Mg	Ba	Zr	Hf	Ga	Ga	Y	Y	2.537	1.150	Ba	Zn	Si	Zr	Al	Al	Al	Sc	2.949	0.825	Mg	Mg	Mg	Ba	Si	Sn	Ti	Zr	3.531	0.785	
Ba	Ba	Si	Hf	Ga	In	In	Y	1935	0.524	Ba	Cd	Zr	Ti	Al	Al	Y	Y	2.537	0.781	Mg	Sr	Zr	Zr	Ti	Sc	Y	Y	Y	2.949	0.844	Mg	Sr	Zn	Zn	Ti	Ti	Zr	Hf	3.532	0.823
Ca	Cd	Sn	Ti	In	In	Sc	Sc	1935	0.412	Ba	Cd	Zr	Zr	Al	Ga	Ga	Sc	2.537	0.699	Be	Sr	Ge	Ti	Sc	Y	Y	Y	2.949	0.770	Mg	Ca	Ca	Zn	Si	Si	Sn	Ti	3.532	0.697	
Be	Ca	Sn	Ti	In	In	In	Sc	1936	0.752	Mg	Ba	Zr	Ti	Hf	Ga	Al	Sc	Y	2.537	0.960	Ca	Ca	Sr	Cd	Si	Ti	Ti	Hf	2.949	0.701	Mg	Ca	Ca	Zn	Ge	Ti	Zr	Zr	3.532	0.752
Ba	Cd	Si	Zr	Ga	Ga	Ga	Y	1936	0.688	Mg	Mg	Cd	Cd	Si	Ge	Sn	Zr	2.538	0.819	Mg	Ba	Ba	Ba	Zn	Ge	Ge	Sn	Zr	2.949	0.587	Be	Zn	Cd	Cd	Si	Ti	Ti	Zr	3.532	0.739
Ba	Zn	Si	Hf	Ga	Ga	In	Y	1936	0.596	Mg	Ba	Ti	Hf	Ga	Ga	Y	Y	2.538	0.651	Be	Ba	Ti	Zr	Hf	In	Sc	Sc	Y	2.949	0.950	Be	Ca	Ba	Ba	Sn	Sn	Ti	Hf	3.532	0.633
Ca	Ca	Ge	Hf	Ga	In	Ga	Sc	1936	1.016	Ca	Ca	Zn	Zn	Si	Ge	Hf	Hf	2.538	1.003	Be	Ca	Zr	Hf	In	Sc	Sc	Sc	2.949	0.843	Be	Ca	Sr	Ge	Ti	Ti	Hf	3.532	0.723		
Sr	Sr	Ge	Sn	Al	Sc	Sc	Y	1936	0.947	Cd	Cd	Ti	Al	Ga	In	Sc	2.538	1.778	Be	Ca	Sr	Cd	Ge	Ti	Ti	Ti	Ti	2.949	0.642	Ca	Sr	Sr	Sr	Ge	Sn	Ti	Hf	3.533	0.725	
Ca	Ca	Ge	Sn	Al	Sc	Sc	Y	1936	0.848	Be	Zn	Cd	Cd	Si	Sn	Sn	Zr	2.538	1.632	Be	Mg	Zr	Cd	Hf	In	In	In	2.949	0.434	Ca	Ca	Ca	Ba	Ge	Sn	Ti	Hf	3.533	0.780	
Be	Sr	Si	Hf	Ga	In	In	In	1936	0.882	Sr	Zn	Hf	Hf	Al	Ga	Ga	In	2.538	1.628	Ca	Ba	Si	Zr	Al	Al	Al	Sc	2.949	0.530	Be	Sr	Sr	Ba	Ge	Sn	Hf	Hf	3.533	1.021	
Mg	Ca	Ge	Hf	In	In	In	Sc	1936	0.921	Sr	Ba	Zn	Zn	Si	Si	Sn	Ti	2.538	0.944	Ca	Sr	Ti	Zr	In	In	Sc	Sc	Sc	2.949	0.520	Be	Ba	Zn	Zn	Si	Si	Ti	Hf	3.533	1.023
Mg	Ca	Sn	Hf	Ga	Ga	In	In	1936	0.822	Zn	Zn	Ti	Zr	Al	In	In	Y	2.538	0.927	Ca	Ca	Sr	Cd	Ti	Zr	Hf	Hf	2.949	0.480	Mg	Ca	Sr	Sr	Si	Sn	Hf	3.533	0.897		
Cd	Cd	Si	Ti	Al	Ga	Ga	In	1936	0.851	Mg	Cd	Si	Si	Al	Ga	Ga	In	2.538	1.404	Be	Mg	Ti	Hf	Ga	Ga	Y	Y	2.949	0.627	Mg	Mg	Si	Hf	Al	Al	Ga	Sc	3.533	0.379	
Ba	Zn	Si	Si	Al	In	In	Sc	1937	0.912	Be	Sr	Ti	Hf	Ga	Ga	In	2.538	1.011	Be	Mg	Sr	Cd	Si	Zr	Zr	Zr	2.949	0.600	Ca	Sr	Sr	Ba	Ge	Ge	Ti	Zr	3.533	0.814		
Be	Ba	Ge	Zr	Ga	Ga	Ga	In	1937	0.814	Zn	Cd	Ge	Hf	Al	Al	In	2.538	0.879	Be	Sr	Zn	Cd	Sn	Zr	Zr	Zr	2.949	0.989	Sr	Sr	Ba	Si	Ge	Ti	Zr	3.533	0.693			
Be	Ca	Sn	Hf	Ga	Ga	In	In	1937	1.139	Ca	Ba	Si	Si	Ti	Ga	Ga	Ga	2.538	1.426	Be	Zn	Si	Zr	Al	In	In	2.949	0.941	Be	Be	Si	Hf	Al	Al	In	Sc	3.534	0.342		
Ca	Cd	Ge	Sn	Al	Al	Al	Ga	1937	1.130	Ca	Ca	Zn	Cd	Si	Si	Ge	Zr	2.538	1.024	Ca	Ca	Ba	Zn	Si	Si	Ge	Sn	2.949	0.844	Mg	Zn	Ge	Zr	Al	Sc	Sc	3.534	0.849		
Cd	Cd	Ge	Hf	Al	Al	Ga	In	1938	1.087	Mg	Ba	Hf	Hf	Al	In	Sc	Sc	2.538	1.223	Mg	Mg	Sr	Cd	Si	Ge	Ge	Hf	2.950	0.473	Be	Mg	Ca	Ca	Si	Si	Sn	Zr	3.534	0.731	
Ba	Cd	Ge	Hf	Al	Al	Y	Y	1938	1.009	Ba	Cd	Ti	Ti	Al	Al	Ga	Y	2.538	1.684	Be	Mg	Ge	Zr	Ga	Y	Y	Y	2.950	0.605	Be	Ca	Ba	Ge	Ge	Sn	Ti	3.534	0.529		
Sr	Sr	Si	Hf	Ga	In	In	Y	1938	1.102	Ba	Cd	Ge	Hf	Sc	Sc	Y	Y	2.539	1.069	Mg	Zn	Hf	Hf	Al	Al	In	Y	2.950	0.694	Be	Mg	Zn	Cd	Zr	Zr	Zr	Hf	3.534	0.944	
Be	Ba	Si	Si	Al	In	In	Y	1938	0.858	Sr	Zn	Sn	Ti	Al	Al	Al	Ga	2.539	1.174	Mg	Ca	Cd	Cd	Si	Si	Ge	Zr	2.950	0.537	Mg	Sr	Sr	Ba	Ge	Sn	Hf	3.534	0.666		
Be	Ba	Sn	Zr	Al	Ga	Ga	Ga	1938	0.979	Be	Sr	Sr	Sr	Zn	Si	Ge	Ge	Sn	2.539	1.723	Be	Mg	Hf	Hf	Ga	In	In	Y	2.950	0.698	Ca	Ca	Ba	Ba	Si	Ge	Sn	Ti	3.534	0.506
Zn	Cd	Ge	Ti	In	In	In	Sc	1939	1.093	Ca	Ba	Hf	Hf	Al	Ga	Ga	In	2.539	0.692	Mg	Sr	Ge	Zr	Al	Sc	Sc	Sc	2.950	0.761	Be	Sr	Sr	Ba	Ge	Sn	Ti	Ti	3.534	0.997	
Ba	Cd	Sn	Hf	Al	Al	Sc	Sc	1939	0.848	Ca	Sr	Sr	Cd	Ge	Ge	Zr	Hf	2.539	0.667	Sr	Cd	Si	Hf	Sc	Sc	Y	Y	2.950	0.546	Be	Ca	Zn	Sn	Ti	Ti	Hf	3.535	0.703		
Ba	Zn	Cd	Cd	Si	Sn	Hf	Hf	1939	0.879	Be	Sr	Hf	Hf	Ga	In	Sc	Sc	2.540	0.807	Be	Cd	Ge	Hf	Sc	Y	Y	Y	2.950	0.786	Ca	Sr	Ba	Ba	Ge	Ge	Sn	Hf	3.535	0.273	
Ca	Ca	Sn	Hf	Al	Ga	Ga	Sc	1939	0.913	Ca	Ca	Si	Ti	Al	Ga	Ga	Y	2.540	1.636	Mg	Ca	Si	Si	Al	Ga	Ga	Sc	2.950	0.969	Mg	Sr	Ba	Zn	Si	Si	Si	Hf	3.535	0.383	
Mg	Ba	Si	Hf	In	In	In	Sc	1939	0.822	Sr	Ba	Ge	Zr	Al	Al	Sc	Sc	2.540	1.532	Zn	Cd	Ti	Ti	In	In	Sc	Sc	2.950	0.585	Mg	Mg	Sr	Ba	Ti	Ti	Zr	Hf	3.535	0.302	
Ca	Ba	Ge	Hf	Ga	Ga	Ga	In	1940	0.854	Sr	Sr	Zn	Cd	Ge	Zr	Zr	Hf	2.540	1.291	Mg	Cd	Ge	Hf	Al	Al	Al	Y	2.950	0.872	Ca	Sr	Ba	Ba	Si	Sn	Ti	Ti	3.535	0.610	
Mg	Ba	Si	Si	In	In	Sc	Y	1940	0.899	Mg	Ca	Si	Hf	In	In	Sc	Sc	2.540	1.799	Be	Ca	Ca	Cd	Ge	Zr	Zr	Hf	2.950	1.051	Ca	Ca	Sr	Ba	Si	Si	Zr	Hf	3.535	1.000	
Mg	Zn	Si	Sn	Ga	Ga	Ga	In	1940	0.803	Sr	Cd	Hf	Hf	Al	Al	Ga	Y	2.540	1.570	Ca	Ba	Si	Zr	Ga	Ga	Y	Y	2.950	0.477	Ca	Sr	Sr	Sr	Ge	Sn	Ti	Zr	3.535	0.825	
Be	Sr	Ge	Ge	Al	Ga	Y	Y	1940	0.905	Mg	Ba	Zr	Hf	Ga	Y	Y	Y	2.540	1.336	Be	Mg	Sn	Ti	Ga	Ga	Ga	In	2.950	0.578	Mg	Ba	Ba	Ba	Ge	Ti	Zr	Hf	3.535	0.587	
Cd	Cd	Ge	Zr	Al	In	Y	Y	1940	0.913	Be	Ba	Zr	Zr	Al	Ga	Y	Y	2.540	1.021	Mg	Ca	Sr	Cd	Ge	Ge	Ge	Hf	2.951	0.604	Mg	Ca	Ba	Zn	Zr	Hf	Hf	Hf	3.536	1.052	
Ca	Cd	Ge	Zr	Ga	Ga	Y	Y	1940	0.772	Ca	Sr	Zr	Zr	Al	In	Y	Y	2.540	0.937																					

Sr	Ba	Zn	Cd	Ge	Ge	Zr	Zr	1953	0.705	Sr	Cd	Ge	Ti	In	Y	Y	Y	2.547	1.143	Mg	Ca	Ti	Zr	Ga	Y	Y	Y	2.958	1.350	Ca	Ca	Sr	Ba	Ge	Ge	Sn	Ti	3.544	0.650		
Cd	Cd	Sn	Hf	Al	Ga	Ga	Sc	1953	0.745	Sr	Cd	Si	Ge	Ga	Sc	Sc	Sc	2.547	1.104	Ca	Ba	Si	Hf	Ga	Al	Sc	Sc	2.958	1.597	Sr	Sr	Sr	Ba	Si	Ge	Sn	Ti	3.544	0.703		
Cd	Cd	Ge	Sn	Al	Ga	Y	Y	1953	0.930	Mg	Sr	Hf	Al	In	In	Sc	Sc	2.547	1.068	Ca	Sr	Si	Hf	Al	Al	Sc	Sc	2.958	1.035	Mg	Mg	Sr	Ba	Ti	Zr	Zr	Hf	3.544	0.627		
Ca	Ca	Ge	Sn	Zr	Al	Al	Sc	Y	1953	0.738	Sr	Zn	Sn	Zr	Sc	Sc	Y	Y	2.547	0.976	Ca	Zn	Ge	Ti	Al	Al	Sc	Sc	2.958	1.418	Be	Ba	Zn	Zn	Si	Ti	Ti	Hf	3.544	0.794	
Sr	Cd	Ti	Zr	Al	Al	In	In	1953	0.746	Zn	Cd	Si	Sn	Al	Al	Al	Y	2.547	1.251	Be	Mg	Si	Sn	In	Sc	Sc	Sc	2.958	1.663	Be	Mg	Mg	Cd	Si	Ti	Ti	Zr	3.545	0.989		
Be	Ba	Si	Zr	In	Al	In	Sc	1953	0.896	Sr	Ba	Ti	Hf	Ga	Ga	Sc	Sc	2.547	1.125	Mg	Sr	Ti	Zr	Al	Al	Y	Y	2.958	0.802	Be	Ca	Ca	Zn	Si	Ti	Ti	Zr	3.545	0.845		
Sr	Sr	Ge	Sn	Al	Al	Y	Y	1953	0.569	Ca	Cd	Si	Hf	Ga	Ga	Sc	Sc	2.547	1.022	Mg	Cd	Hf	Hf	Ga	In	Sc	Sc	2.958	0.918	Be	Zn	Zn	Cd	Si	Ti	Ti	Hf	3.545	0.804		
Ca	Cd	Si	Zr	In	Al	In	Sc	1953	0.570	Ca	Cd	Sn	Zr	Ga	Y	Y	Y	2.547	1.026	Cd	Cd	Si	Hf	Ga	Sc	Sc	Y	2.959	0.950	Mg	Sr	Ba	Ba	Ti	Ti	Zr	Hf	3.545	1.022		
Ca	Ba	Ge	Ge	In	Sc	Sc	Y	1953	0.540	Mg	Ba	Sn	Ti	Ga	Sc	Sc	Sc	2.547	0.945	Ca	Ca	Ge	Zr	Al	Sc	Y	Y	2.959	0.901	Be	Mg	Ba	Ba	Sn	Ti	Ti	Hf	3.545	0.558		
Ca	Ca	Si	Ge	Al	Ga	Ga	In	1954	0.479	Sr	Sr	Sn	Zr	Al	Sc	Y	Y	2.547	1.024	Mg	Ca	Cd	Cd	Si	Ti	Hf	Hf	2.959	0.815	Be	Mg	Mg	Ba	Si	Si	Ge	Sn	3.546	0.707		
Ba	Cd	Cd	Cd	Ge	Sn	Zr	Hf	1954	0.398	Cd	Cd	Ti	Hf	Al	Al	In	Sc	2.547	1.136	Be	Ca	Si	Hf	Ga	Ga	Sc	Sc	2.959	0.703	Mg	Mg	Sr	Zn	Si	Ti	Zr	Zr	3.546	0.758		
Mg	Zn	Ge	Ge	In	Sc	Y	Y	1954	0.317	Ba	Ba	Zn	Zr	Hf	Al	Al	Y	2.548	1.002	Be	Ba	Ti	Zr	Al	Sc	Sc	Sc	2.959	1.073	Be	Sr	Ba	Ba	Si	Sn	Ti	Ti	3.546	0.674		
Ca	Ba	Zn	Cd	Ge	Ge	Ge	Sn	1954	0.583	Ca	Zn	Si	Ti	Ga	Ga	Ga	Y	2.548	1.111	Mg	Mg	Ge	Ti	Ga	Ga	Sc	Y	2.959	0.958	Be	Ca	Zn	Zn	Sn	Ti	Ti	Hf	3.546	0.709		
Zn	Zn	Si	Ge	Ge	Ga	In	Y	1954	0.607	Zn	Zn	Sn	Ti	Ga	In	Sc	Sc	2.548	1.269	Ca	Ba	Zr	Zr	Al	Sc	Y	Y	2.959	0.767	Be	Be	Si	Hf	Al	Ga	Ga	In	3.546	0.776		
Sr	Sr	Ge	Ti	Al	Ga	In	In	1954	0.521	Ca	Zn	Si	Sn	Al	Y	Y	Y	2.548	1.161	Sr	Zn	Ti	Ti	In	Sc	Y	Y	2.959	0.502	Mg	Ca	Ca	Zn	Si	Ge	Ge	Zr	3.546	0.892		
Sr	Ba	Si	Sn	In	Y	Y	Y	1954	0.417	Sr	Ba	Ba	Cd	Cd	Sn	Ti	Hf	Hf	2.548	1.142	Be	Ca	Zn	Zn	Si	Si	Ge	Ge	Sn	2.959	0.639	Be	Mg	Si	Ti	Al	Y	Y	Y	3.547	0.981
Sr	Sr	Sn	Ti	Al	In	Y	Y	1954	0.569	Mg	Cd	Zr	Ba	Ga	In	Y	Y	2.548	1.075	Sr	Cd	Si	Hf	Sc	Sc	Sc	Y	2.959	0.646	Be	Mg	Si	Hf	Sc	Sc	Y	Y	3.547	0.923		
Be	Mg	Sr	Cd	Si	Sn	Sn	Sn	1954	0.485	Sr	Ba	Ba	Cd	Si	Ti	Hf	Hf	2.548	0.962	Ca	Sr	Sr	Zn	Si	Ge	Zr	Zr	2.959	0.515	Be	Zn	Ge	Ti	Ga	Sc	Sc	Sc	3.547	0.895		
Sr	Ba	Ge	Ge	Al	Ga	Y	Y	1954	0.385	Be	Ba	Zr	Hf	In	Sc	Sc	Sc	2.548	1.103	Mg	Ca	Cd	Cd	Sn	Zr	Zr	Hf	2.959	0.726	Be	Mg	Sr	Ba	Sn	Hf	Hf	Zr	3.547	0.792		
Be	Cd	Si	Sn	In	In	Sc	Sc	1954	0.560	Ba	Ba	Zn	Si	Sn	Sc	Y	Y	2.548	1.213	Be	Be	Ba	Zn	Si	Zr	Hf	Hf	2.959	0.732	Mg	Ca	Sr	Zn	Ti	Zr	Zr	Zr	3.547	0.859		
Ca	Sr	Si	Si	Al	In	In	Y	1954	0.476	Mg	Sr	Ba	Cd	Cd	Ge	Ge	Zr	Zr	2.548	1.014	Sr	Cd	Ti	Hf	Al	Y	Y	Y	2.960	1.111	Be	Be	Si	Hf	Al	Ga	Ga	Y	3.548	0.840	
Mg	Zn	Sn	Sn	In	Sc	Y	Y	1955	0.744	Mg	Sr	Cd	Cd	Si	Si	Sn	Hf	2.548	1.173	Be	Ca	Sc	Cd	Si	Si	Zr	Zr	2.960	1.072	Be	Ca	Zn	Zn	Si	Ti	Hf	Hf	3.548	0.804		
Mg	Ca	Ge	Ge	Ga	In	Sc	Sc	1955	0.835	Mg	Ba	Ca	Ti	Zr	Al	Al	Y	2.548	1.146	Ca	Sc	Zn	Zn	Sn	Ti	Zr	Zr	2.960	0.984	Be	Zn	Si	Hf	Al	Al	Sc	Sc	3.548	0.863		
Ba	Cd	Ti	Ti	Ga	In	In	Y	1955	0.585	Ca	Ca	Ca	Ti	Zr	Ga	In	Y	Y	2.548	1.206	Be	Sr	Sr	Zn	Zn	Ge	Ge	Sn	Hf	2.960	0.538	Be	Sr	Ba	Ba	Sn	Zr	Hf	Hf	3.548	0.847
Ca	Sr	Cd	Cd	Si	Sn	Zr	Zr	1955	0.585	Be	Ba	Ba	Cd	Si	Zr	Hf	Hf	2.548	1.360	Zn	Zn	Si	Ti	Al	Al	Ga	In	2.960	0.731	Mg	Sr	Ba	Ba	Si	Sn	Ti	Ti	3.548	0.882		
Cd	Cd	Ge	Ge	Al	Ga	Sc	Y	1955	0.795	Mg	Ba	Zn	Zr	Hf	In	In	Y	Y	2.548	1.260	Be	Be	Be	Ba	Sn	Ti	Zr	Hf	2.960	0.834	Be	Ca	Ba	Ba	Sn	Zr	Zr	Hf	3.548	0.997	
Mg	Ca	Ge	Hf	In	In	Y	Y	1955	0.534	Sr	Zn	Sn	Zr	Al	Y	Y	Y	2.548	1.253	Be	Be	Sr	Cd	Ge	Ge	Zr	Hf	2.960	0.569	Be	Be	Mg	Sr	Ge	Ti	Ti	Zr	3.549	0.876		
Sr	Zn	Sn	Hf	Al	Al	Ga	Ga	1956	0.553	Sr	Sr	Ti	Hf	Al	Al	Ga	In	2.548	1.447	Sr	Sr	Si	Ti	In	Sc	Y	Y	2.960	0.815	Mg	Sr	Ba	Zn	Si	Si	Si	Zr	3.549	0.906		
Sr	Zn	Ge	Ti	Al	Al	In	In	1956	0.785	Sr	Cd	Ti	Ti	In	In	Sc	Sc	2.548	1.091	Ca	Cd	Zr	Zr	Al	Al	Sc	Y	2.960	0.909	Ca	Ca	Ca	Sr	Si	Ge	Sn	Hf	3.549	1.017		
Sr	Cd	Ti	Zr	Al	Al	In	In	1956	0.523	Ca	Zn	Ti	Ti	In	In	Sc	Y	2.549	1.098	Be	Be	Ba	Zn	Si	Si	Ge	Zr	2.960	0.616	Mg	Mg	Ti	Zr	Al	Al	Sc	Y	3.549	0.880		
Ba	Ba	Zn	Zn	Cd	Si	Sn	Hf	Hf	1956	0.576	Sr	Ba	Ti	Ti	Al	Al	In	Y	2.549	1.176	Ca	Zn	Ti	Zr	Ga	Ga	Ga	Sc	2.960	0.904	Be	Mg	Sr	Ba	Sn	Sn	Zr	Zr	3.550	0.844	
Ba	Cd	Sn	Ti	Al	Al	Y	Y	1957	0.617	Mg	Ba	Sn	Hf	Sc	Sc	Y	Y	2.549	1.771	Be	Ca	Ca	Cd	Sn	Ti	Zr	Zr	2.960	1.095	Be	Mg	Ca	Cd	Si	Si	Si	Hf	3.550	0.861		
Ca	Zn	Ge	Ge	Al	Ga	Ga	In	1957	0.389	Zn	Zn	Si	Sn	Al	Ga	Sc	Sc	2.549	1.649	Be	Mg	Zr	Zr	In	Sc	Y	Y	2.960	0.620	Mg	Mg	Si	Si	Al	Sc	Y	Y	3.550	0.784		
Ba	Ba	Ge	Ti	Al	Ga	In	In	1957	0.550	Mg	Mg	Si	Ge	Al	In	In	Sc	2.549	1.418	Mg	Ba	Ti	Zr	Ga	Ga	Sc	Sc	2.960	0.982	Ca	Ca	Sr	Sr	Ge	Ti	Zr	Zr	3.550	0.873		
Be	Zn	Sn	Hf	Ga	Ga	In	In	1957	0.602	Sr	Ba	Zn	Cd	Cd	Ti	Ti	Ti	Zr	2.549	1.928	Be	Mg	Ti	Hf	Ga	Y	Y	Y	2.961	1.183	Be	Be	Ca	Sr	Ge	Ti	Ti	Zr	3.550	0.967	
Mg	Sr	Sr	Cd	Si	Ge	Sn	Sn	1958	0.369	Ba	Cd	Sn	Ti	Al	Y	Y	Y	2.550	1.690	Ca	Ba	Ba	Zn	Ge	Sn	Ti	Ti	2.961	0.520	Be	Mg	Ca	Zn	Si	Ge	Ge	Ge	3.550	0.846		
Zn	Cd	Si	Si	Al	Ga	Ga	In	1958	0.683	Ca	Sr	Sr	Cd	Ge	Sn	Sn	Ti	2.550	1.470	Mg	Ba	Si	Hf	Al	Y	Y	Y	2.961	0.646	Be	Sr	Zn	Zn	Si	Zr	Zr	Hf	3.551	0.897		
Ca	Zn	Si	Si	Ga	In	In	Y	1958	0.690	Mg	Sr	Sn	Hf	Sc	Sc	Sc	Y	2.550	1.114	Be	Zn	Ge	Ti	Ga	Y	Y	Y	2.961	0.685	Mg	Mg	Ti	Zr	Al	Al	Ga	In	3.551	0.985		
Ba	Ba	Sn	Ti	Al	In	Y	Y	1958	0.324	Sr	Sr	Ti	Zr	Al	Al	Ga	Y	2.550	1.074	Zn	Cd	Hf	Hf	Al	Al	Sc	Sc	Y	2.961	0.908	Mg	Mg	Zn	Zn	Sn	Ti	Zr	Hf	3.551	0.844	
Be	Sr	Si	Ti	Ga	In	Sc	Y	1958	0.821	Mg	Ba	Hf	Hf	In	Sc	Sc	Y	2.550	1.315	Be	Be	Ge	Hf	Ga	Sc	Y	Y	2.961	0.845	Sr	Sr	Ba	Ba	Si	Ge	Sn	Ti	3.551	0.870		
Cd	Cd	Ge	Sn	Ga	Sc	Sc	Y	1958	0.914	Mg	Sr	Ba	Cd	Si	Ge	Ge	Ge	2.550	1.116	Mg	Ca	Hf	Hf	Al	In	Sc	Sc	Y	2.961	0.771	Be	Mg	Ge	Zr	Al	Al	Al	In	3.551	0.885	
Ba	Zn	Zn	Cd	Ge	Sn	Hf	Hf	1959	0.747	Zn	Zn	Si	Zr	Ga	In	In	Sc	2.550	1.025	Ba	Cd	Ti	Hf	Sc	Sc	Y	Y	2.961	1.046	Mg	Mg	Zn	Sn	Ti	Ti	Zr	3.551	0.758			
Be	Cd	Cd	Hf	In	In	Sc	Sc	1959	0.649	Mg	Sr	Si	Hf	Ga	Ga	Sc	Sc	2.550	1.362	Mg	Zn	Ge	Zr	Al	Al	Ga	Ga	2.961	0.967	Be	Mg	Ti	Hf	Ga	Ga	Sc	Sc	3.551	0.850		
Sr	Cd	Sn	Zr	Al	Al	Al	In	1959	0.872	Mg	Ba	Cd	Cd	Si	Ge	Ti	Ti	2.550	2.029	Be	Ca	Zn	Zn	Si	Sn	Hf	Hf	2.961	0.829	Mg	Ca	Sr	Zn	Sn	Ti	Ti	Ti	3.552	0.880		
Mg	Sr	Sn	Hf	Ga	Ga	Ga	Sc	1959	0.692	Sr	Cd	Ti	Hf	Al	Al	Y	Y	2.550	1.899	Mg	Cd	Ti	Hf	Ga	Ga	Ga	Y	2.961	0.607	Mg	Ca	Sn	Si	Hf	Sc	Y	Y	Y	3.552		

Ba	Ba	Si	Zr	Al	In	In	Y	1.969	0.303	Ca	Cd	Ti	Hf	Ga	Ga	Ga	Y	2.555	1.077	Sr	Ba	Si	Zr	Ga	Sc	Sc	Sc	2.967	0.780	Ca	Ca	Sr	Ba	Si	Sn	Ti	Ti	3.563	1.499	
Mg	Ba	Si	Ti	Ga	In	In	In	1.969	0.240	Sr	Zn	Si	Ge	In	Sc	Sc	Sc	2.556	1.039	Mg	Ca	Ca	Cd	Si	Si	Sn	Hf	2.967	1.056	Be	Be	Si	Ge	Al	In	Sc	3.563	1.313		
Bd	Cd	Sn	Ti	Ga	Ga	Sc	Sc	1.969	0.288	Be	Cd	Ge	Sn	Al	Al	Sc	Sc	2.556	1.120	Mg	Ca	Ba	Zr	Hf	Sc	Sc	Y	2.967	0.985	Be	Zn	Zr	Zr	Ga	Sc	Sc	Y	3.563	0.734	
Be	Sr	Si	Ge	Ga	Ga	Ga	Sc	1.969	0.291	Sr	Ba	Sn	Hf	Sc	Sc	Y	Y	2.556	1.159	Mg	Mg	Sn	Ti	Al	Al	Ga	Y	2.967	0.907	Be	Be	Ti	Zr	Ga	Ga	In	Sc	3.563	0.881	
Ca	Zn	Si	Ge	Ga	Ga	Ga	Y	1.969	0.155	Ca	Zn	Zr	Zr	Al	In	Y	Y	2.556	1.094	Ca	Ca	Sr	Cd	Ti	Zr	Zr	Hf	2.967	1.182	Mg	Ca	Ca	Zn	Si	Ti	Zr	Zr	3.563	0.918	
Ca	Sr	Ba	Cd	Ge	Sn	Sn	Sn	1.970	0.321	Ba	Ba	Ti	Zr	Ga	Ga	In	Sc	2.556	1.212	Be	Be	Sn	Sn	In	Sc	Sc	Y	2.967	1.104	Be	Be	Si	Ti	Al	Al	In	Y	3.563	0.782	
Ca	Ca	Zn	Cd	Ge	Sn	Sn	Hf	1.970	0.337	Ba	Ba	Hf	Hf	Al	Al	Ga	In	2.556	1.351	Mg	Sr	Zn	Cd	Ge	Hf	Hf	Hf	2.967	0.960	Be	Sr	Sr	Sr	Si	Ti	Zr	Zr	3.563	0.944	
Mg	Sr	Si	Ge	Al	Ga	Ga	Ga	1.970	0.192	Ca	Zn	Zn	Cd	Ge	Ge	Zr	Hf	2.556	1.253	Zn	Cd	Zr	Hf	Ga	Ga	Ga	Sc	2.967	0.701	Be	Mg	Ca	Zn	Ti	Ti	Hf	Hf	3.563	1.202	
Mg	Ba	Ge	Zr	Ga	Ga	Ga	In	1.970	0.195	Ca	Cd	Si	Si	Al	Ga	Ga	Sc	2.556	1.239	Mg	Ca	Zn	Cd	Ge	Ge	Ge	Ti	2.968	0.870	Be	Zn	Zr	Zr	Al	Ga	Ga	Sc	3.563	1.835	
Sr	Sr	Ge	Ti	Al	Ga	Ga	In	1.971	0.303	Ca	Zn	Si	Hf	Ga	Ga	Ga	Sc	2.556	1.115	Ca	Cd	Zr	Hf	Al	Ga	Sc	Sc	2.968	0.882	Mg	Ca	Zn	Zr	Ge	Ti	Zr	Zr	3.563	1.853	
Ca	Cd	Ge	Hf	Al	Al	Ga	Ga	1.971	0.158	Be	Cd	Sn	Ti	Al	Al	Y	Y	2.556	1.066	Mg	Cd	Sn	Ti	Al	Al	Al	Y	2.968	0.655	Mg	Ca	Sr	Si	Ge	Ge	Ge	3.564	1.718		
Ca	Cd	Ge	Sn	Ga	Y	Y	Y	1.971	0.172	Sr	Zn	Si	Si	Al	Al	Ga	Y	2.556	1.200	Mg	Zn	Hf	Hf	In	Sc	Y	Y	2.968	0.926	Be	Mg	Sn	Ti	Sc	Sc	Sc	Y	3.564	1.265	
Ca	Ba	Ge	Zr	Ga	Ga	In	In	1.971	0.297	Mg	Ba	Ba	Zn	Si	Ge	Ge	Sn	2.556	1.226	Ca	Zn	Zr	Zr	Al	Al	Ga	Y	2.968	0.958	Ca	Ca	Ca	Sr	Si	Ge	Sn	Zr	3.564	1.673	
Ba	Zn	Sn	Hf	Al	Al	Al	In	1.971	0.153	Ba	Zn	Si	Hf	In	Y	Y	Y	2.556	1.118	Be	Cd	Ti	Ti	Ga	Ga	Sc	Y	2.968	1.182	Mg	Mg	Ca	Ba	Si	Si	Sn	Ti	3.564	1.540	
Cd	Cd	Sn	Ti	Al	Ga	Ga	Y	1.971	0.562	Be	Zn	Zr	Hf	Al	In	In	In	2.556	1.276	Be	Ca	Ge	Ti	In	Sc	Sc	Sc	2.968	1.165	Mg	Mg	Ba	Ba	Si	Sn	Zr	Hf	3.564	1.170	
Bd	Cd	Sn	Hf	Al	Al	Al	Ga	1.971	0.552	Ba	Cd	Si	Ti	Al	Al	Al	In	2.557	1.185	Be	Cd	Zr	Hf	Al	Al	In	Sc	2.968	1.089	Be	Sr	Ba	Ba	Si	Sn	Hf	Hf	3.564	1.688	
Ba	Zn	Cd	Cd	Sn	Sn	Ti	Hf	1.971	0.168	Be	Ba	Ba	Cd	Si	Ti	Zr	Zr	2.557	1.298	Be	Be	Ge	Sn	Al	Al	In	Sc	2.968	0.695	Mg	Ca	Ba	Ba	Ge	Sn	Hf	3.565	1.558		
Mg	Mg	Ge	Cd	Ga	Ga	Ga	In	Sc	1.971	0.449	Ca	Sr	Zr	Hf	Ga	Ga	In	2.557	1.440	Mg	Ca	Sr	Cd	Ge	Ge	Ge	Zr	2.968	0.903	Be	Mg	Zn	Cd	Si	Si	Ge	Ge	3.565	1.387	
Cd	Cd	Ge	Ti	Ga	In	Y	Y	1.972	0.521	Be	Sr	Sr	Cd	Ge	Ge	Sn	Ti	2.557	1.272	Mg	Ca	Sr	Cd	Ge	Ge	Ge	Ti	2.968	0.985	Mg	Ca	Ba	Ba	Ge	Sn	Ti	Ti	3.565	1.760	
Ba	Cd	Zr	Hf	Ga	In	In	In	1.972	0.125	Mg	Mg	Sr	Cd	Ge	Ge	Sn	Zr	2.557	1.345	Cd	Cd	Si	Ti	Al	Ga	Sc	Sc	2.969	0.668	Mg	Ba	Ba	Ba	Si	Ge	Zr	Hf	3.565	1.497	
Ba	Ba	Zn	Cd	Ge	Ge	Sn	Ti	1.972	0.427	Mg	Ba	Zr	Hf	Ga	Ga	Ga	In	2.557	1.532	Be	Sr	Sr	Zn	Ge	Ge	Sn	Ti	2.969	0.954	Mg	Sr	Sr	Ba	Si	Sn	Zr	Zr	3.565	1.306	
Ca	Sr	Sn	Ti	Al	Al	In	In	1.972	0.516	Mg	Sr	Ge	Ti	Ga	Ga	Sc	Sc	2.557	1.121	Be	Sr	Si	Hf	Sc	Y	Y	Y	2.969	1.052	Mg	Mg	Ca	Zn	Si	Ge	Zr	Zr	3.565	1.794	
Ba	Ba	Sn	Zr	Al	Ga	Ga	Y	1.972	0.118	Ca	Ca	Si	Hf	Ga	Ga	Sc	Y	2.557	1.153	Be	Be	Ca	Cd	Si	Si	Ge	Zr	2.969	0.751	Be	Mg	Ba	Ba	Si	Si	Ge	Zr	3.565	1.513	
Be	Ba	Ge	Hf	Ga	Ga	Ga	Y	1.972	0.266	Mg	Ba	Zn	Zr	Zr	Al	Al	Y	Y	2.557	1.237	Ba	Zn	Ti	Zr	Al	Al	Y	Y	2.969	1.032	Be	Zn	Ti	Zr	Al	Al	In	3.566	1.009	
Sr	Ba	Si	Si	Ga	In	In	Sc	1.973	0.313	Ba	Ba	Si	Ti	Ga	Ga	Sc	Y	2.557	1.404	Mg	Cd	Ti	Hf	Al	Ga	Ga	Ga	2.969	1.191	Mg	Zn	Sr	Ba	Zr	Zr	Zr	Hf	3.566	1.155	
Ba	Ba	Sn	Ti	Al	Al	In	Sc	1.973	0.068	Be	Sr	Si	Ti	Ga	Ga	Ga	Y	2.557	1.300	Be	Ba	Si	Zr	Sc	Sc	Sc	Y	2.969	0.699	Mg	Zn	Ge	Ti	Sc	Y	Y	Y	3.566	1.153	
Zn	Cd	Sn	Hf	Al	Ga	Ga	Ga	1.973	0.247	Sr	Cd	Zr	Zr	Al	Al	In	Sc	2.557	1.162	Be	Be	Sr	Zn	Si	Si	Sn	Ti	2.969	1.078	Mg	Mg	Sr	Ba	Sn	Ti	Zr	Zr	3.566	1.466	
Ba	Zn	Si	Hf	In	Ga	In	Sc	1.973	0.304	Mg	Cd	Si	Ge	Al	Al	Ga	Ga	2.557	1.548	Ca	Zn	Ti	Zr	In	Y	Y	Y	2.969	1.272	Mg	Ca	Sr	Zn	Ti	Ti	Ti	Hf	3.566	1.813	
Sr	Zn	Ge	Zr	Ga	Ga	Ga	Sc	1.973	0.054	Sr	Cd	Ti	Hf	Al	Al	Ga	Ga	2.557	1.359	Mg	Sr	Ti	Hf	Al	Al	Al	Y	2.969	0.661	Be	Ca	Sr	Sr	Si	Sn	Zr	Zr	3.566	1.664	
Ca	Zn	Si	Si	Al	In	Y	Y	1.974	0.386	Mg	Cd	Ti	Hf	Al	Al	In	In	2.558	1.214	Be	Ca	Si	Hf	Al	Al	Al	Y	2.969	0.813	Be	Zn	Ti	Zr	Ga	Ga	Ga	Sc	3.566	1.364	
Sr	Cd	Ge	Ti	Ga	Ga	Ga	Sc	1.974	0.393	Ca	Zn	Si	Ti	In	In	Sc	Sc	2.558	1.014	Ca	Ca	Si	Hf	Ga	Sc	Sc	Y	2.969	0.871	Mg	Mg	Ba	Zn	Ge	Ti	Zr	Hf	3.566	1.846	
Ba	Ba	Zn	Cd	Si	Sn	Ti	Ti	1.974	0.013	Mg	Ca	Si	Zr	Ga	Ga	In	In	2.558	1.023	Be	Mg	Sn	Ti	Al	Al	Y	Y	2.969	1.061	Be	Mg	Ba	Ba	Ti	Ti	Zr	Hf	3.566	1.678	
Be	Zn	Sn	Hf	Al	In	In	In	1.974	0.646	Ba	Zn	Si	Si	Al	Ga	Sc	Sc	2.558	1.145	Mg	Ca	Cd	Cd	Sn	Ti	Ti	Hf	2.969	0.994	Mg	Mg	Ca	Ba	Sn	Zr	Hf	Hf	3.566	1.127	
Ca	Ca	Sn	Hf	Ga	Ga	Ga	Sc	Y	1.974	0.627	Mg	Mg	Ge	Hf	Al	In	In	Sc	2.558	1.050	Sr	Ba	Si	Si	Ga	Sc	Y	Y	2.969	0.922	Be	Be	Ge	Ti	Ga	Sc	Sc	Y	3.566	1.271
Be	Sr	Sn	Ti	Ga	Ga	Ga	Sc	Y	1.974	0.389	Ba	Cd	Si	Hf	Al	Al	Sc	2.558	1.049	Zn	Zn	Ti	Zr	Ga	Ga	Sc	Y	2.969	1.183	Be	Be	Mg	Sr	Zi	Ti	Zr	Zr	3.566	1.345	
Zn	Cd	Ge	Ge	Ga	Ga	Ga	Sc	Y	1.974	0.528	Be	Be	Ca	Cd	Ge	Sn	Ti	2.558	1.218	Zn	Cd	Ge	Hf	Ga	Sc	Sc	Sc	2.970	1.110	Be	Mg	Sr	Ba	Zi	Zr	Hf	Hf	3.567	1.162	
Mg	Cd	Ge	Sn	In	Y	Y	Y	1.974	0.600	Be	Sr	Sr	Si	Si	Ga	Ga	Sc	Y	2.558	1.578	Be	Be	Ba	Zn	Si	Zr	Zr	Hf	2.970	0.973	Be	Zn	Zn	Cd	Ca	Ti	Ti	Zr	3.567	1.322
Sr	Cd	Ge	Sn	Ga	Sc	Sc	Sc	1.975	0.348	Ba	Zn	Ti	Hf	Ga	Ga	Sc	Sc	2.558	1.477	Ca	Sr	Zr	Hf	Ga	Sc	Sc	Sc	2.970	0.720	Mg	Sr	Ba	Ba	Ge	Ge	Sn	Ti	3.567	1.599	
Zn	Zn	Si	Ge	Ga	In	In	Sc	1.975	0.505	Sr	Ba	Ge	Zr	In	Y	Y	Y	2.558	1.460	Ca	Ca	Si	Ti	Al	Al	Ga	Sc	2.970	0.890	Be	Zn	Si	Ti	Ga	Ga	Ga	Sc	3.567	1.085	
Be	Sr	Ba	Zn	Ge	Sn	Sn	Sn	1.975	0.594	Be	Sr	Ti	Ti	In	Sc	Y	Y	2.558	1.083	Mg	Zn	Ti	Ti	Ga	In	In	Sc	2.970	0.902	Ca	Zn	Si	Ti	Sc	Y	Y	Y	3.567	1.061	
Ca	Ba	Ge	Al	Ga	Ga	Y	Y	1.975	0.341	Sr	Ba	Zn	Zn	Si	Si	Zr	Hf	2.558	1.133	Ba	Ba	Ba	Zn	Si	Ti	Hf	Hf	2.970	0.671	Mg	Cd	Si	Si	Al	Sc	Sc	Y	3.567	0.998	
Ba	Cd	Sn	Hf	Al	Al	Al	Sc	1.975	0.335	Be	Zn	Zn	Cd	Ge	Sn	Hf	Hf	2.558	1.352	Mg	Ca	Zr	Hf	Ga	Ga	Ga	Y	2.970	0.943	Be	Ba	Zn	Zn	Ti	Ti	Zr	Hf	3.567	0.744	
Bd	Zn	Ge	Ge	Al	Ga	In	In	1.975	0.388	Mg	Cd	Cd	Cd	Si	Ge	Sn	Hf	2.558	1.150	Ca	Ca	Si	Zr	In	Sc	Y	Y	2.970	0.979	Be	Zn	Ge	Ti	Al	Al	Sc	Sc	3.568	0.951	
Ca	Sr	Ge	Hf	Ga	Ga	Ga	In	1.976	0.306	Mg	Sr	Zr	Zr	Ga	In	In	Sc	2.558	1.158	Mg	Ca	Zr	Zr	Ga	Sc	Y	Y	2.970	1.178	Mg	Sr	Ba	Ba	Ge	Ti	Zr	Zr	3.568	0.895	
Be	Ba	Si	Ti	Al	In	Ga	In	1.976	0.315	Mg	Sr	Sr	Cd	Sn	Sn	Sn	Ti	2.558	1.407	Mg	Zn	Cd	Cd	Si	Si	Sn	Ti	2.970	1.163	Mg	Mg	Mg	Zn	Si	Ge	Zr	Ti	3.568	0.723	
Be	Ca																																							

Ba	Ba	Sn	Ti	Al	In	Sc	Sc	1986	0.414	Be	Ba	Cd	Cd	Si	Ge	Hf	Hf	2.564	1.209	Zn	Cd	Ge	Ti	Al	Y	Y	Y	2.976	0.697	Be	Mg	Mg	Ba	Si	Si	Sn	Hf	3.577	1.022	
Sr	Zn	Ge	Ti	In	In	Sc	Sc	1986	0.407	Ba	Ba	Ti	Hf	Al	Al	Ga	Sc	2.564	1.160	Mg	Ca	Si	Ti	Ga	Ga	Sc		2.976	0.749	Mg	Ca	Sr	Zn	Si	Ti	Ti	3.577	0.750		
Cr	Sr	Cd	Cd	Ge	Ge	Sn	Hf	1986	0.515	Sr	Cr	Ge	Zr	Ga	Y	Y		2.564	1.108	Mg	Mg	Ge	Hf	Al	Al	Ga	In		0.692	Ca	Sr	Sr	Ba	Si	Si	Sn	Hf	3.578	0.578	
Be	Ba	Ge	Zr	Al	Al	In	In	1986	0.391	Ba	Ba	Zn	Ti	Zr	Ga	Ga	Sc	2.564	1.016	Zn	Zn	Si	Hf	Al	Al	Ga	Y	2.976	0.710	Be	Zn	Zr	Zr	Al	Al	Ga	Sc	3.577	0.424	
Mg	Sr	Sn	Zr	Ga	Ga	Y	Y	1986	0.381	Be	Zn	Ti	Hf	Al	In	In		2.564	1.104	Ca	Ba	Ti	Ti	Ga	Sc	Y	Y	2.977	0.792	Sr	Ba	Ba	Ba	Si	Si	Sn	Hf	3.577	0.125	
Mg	Ba	Ge	Ti	Ga	Ga	Ga	In	1986	0.510	Be	Si	Sn	Ga	Ga	In	Y		2.564	1.236	Ca	Ba	Si	Ti	In	Sc	Sc	Sc	2.977	0.708	Be	Mg	Ca	Cd	Si	Si	Ti	Ti	3.577	0.278	
Mg	Zn	Sn	Ti	In	In	In	Y	1986	0.387	Ba	Ba	Zn	Zn	Sn	Si	Ge	Ti	2.564	1.067	Be	Zn	Sn	Hf	In	Sc	Sc	Sc	2.977	0.977	Mg	Zn	Ti	Zr	Al	Al	Al	In	3.577	0.131	
Sr	Ba	Cd	Cd	Si	Ge	Ge	Hf	1986	0.762	Ca	Ba	Ti	Zr	Ga	Ga	In		2.565	1.148	Ca	Zn	Si	Zr	Al	Al	In		2.977	0.945	Be	Ba	Ba	Ba	Si	Ge	Sn	Ti	3.578	0.329	
Ba	Cd	Ge	Ge	Ge	Sc	Y	Y	1987	0.690	Mg	Cd	Sn	Ti	Al	Al	Ga	Ga		2.565	1.140	Be	Mg	Sr	Cd	Si	Si	Si	Sn	2.977	0.829	Ca	Sr	Sr	Ba	Ge	Ge	Ti	Zr	3.578	0.335
Be	Cd	Sn	Sn	Al	Sc	Y	Y	1987	0.340	Be	Ca	Zr	Hf	Ga	Y	Y		2.565	1.215	Be	Ca	Sr	Cd	Si	Ti	Ti	Ti	2.977	0.675	Be	Mg	Sn	Zr	Al	Al	Al	Ga	3.578	0.191	
Be	Zn	Si	Ge	In	In	In	Y	1987	0.633	Cd	Cd	Ge	Hf	In	Sc	Sc	Y	2.565	1.344	Be	Be	Ba	Cd	Cd	Si	Si	Zr	Hf	2.977	0.690	Be	Ca	Ca	Ba	Ge	Sn	Sn	Ti	3.578	0.220
Ca	Zn	Ge	Zr	Ga	Ga	Y	Y	1987	0.666	Sr	Ba	Si	Sn	Sc	Sc	Y	Y	2.565	1.253	Be	Mg	Sr	Cd	Ge	Ge	Hf	Hf	2.977	0.718	Ca	Ca	Sr	Ba	Si	Si	Sn	Ti	3.579	0.522	
Sr	Ba	Si	Zr	In	In	In	Sc	1988	0.306	Be	Sr	Ba	Cd	Ge	Hf	Hf	Hf	2.565	1.262	Be	Be	Ba	Zn	Sn	Zr	Hf	Hf	2.977	0.709	Be	Mg	Ca	Cd	Si	Si	Si	Zr	3.579	0.282	
Ba	Ba	Si	Ge	Ge	Ga	Sc	Y	1988	0.607	Sr	Ba	Si	Sn	Sc	Sc	Y	Y	2.565	1.397	Be	Ba	Si	Zr	Sc	Sc	Sc	Y	2.977	0.729	Mg	Mg	Sr	Ba	Sn	Ti	Ti	Hf	3.579	0.438	
Be	Ca	Sn	Zr	Ga	Ga	In	In	1988	0.661	Ca	Cd	Zr	Hf	Ga	Ga	In		2.565	1.035	Mg	Mg	Si	Zr	Al	In	In	Sc	2.978	0.723	Be	Mg	Sr	Zn	Ge	Ge	Ti	Ti	3.579	0.593	
Ba	Ba	Zn	Cd	Si	Ge	Ge	Hf	1988	0.300	Sr	Ba	Ba	Cd	Ge	Ge	Ti	Hf	2.565	1.053	Be	Ba	Si	Si	Al	Al	Sc	Sc	Y	2.978	0.679	Be	Ca	Ba	Ba	Sn	Ti	Zr	Zr	3.579	0.339
Sr	Sr	Sn	Ti	Ga	In	Sc	Sc	1988	0.447	Ba	Ba	Si	Ti	Al	Al	Ga	Sc	2.565	1.097	Zn	Zn	Cd	Cd	Sn	Ti	Zr	Hf	2.978	0.784	Be	Be	Ti	Hf	Al	Al	In	Sc	3.579	0.145	
Mg	Sr	Si	Sn	In	Sc	Sc	Sc	1988	0.526	Ca	Ca	Sr	Zn	Si	Ge	Sn	Sn	2.565	1.146	Ca	Ba	Si	Si	Al	Al	Sc	Y	2.978	0.927	Be	Sr	Sr	Ba	Sn	Ti	Hf	Hf	3.579	0.041	
Sr	Cd	Ge	Ge	Al	Al	Sc	Y	1988	0.318	Mg	Zn	Ti	Hf	Al	In	In	In	2.565	1.111	Mg	Sr	Zn	Zn	Si	Sn	Ti	Ti	2.978	0.691	Be	Be	Si	Zr	Al	In	Sc	Sc	3.580	0.062	
Ca	Sr	Ge	Ge	Al	Ca	In	In	1989	0.423	Ba	Cd	Sn	Ti	Sc	Sc	Y	Y	2.565	1.024	Ca	Ca	Sr	Cd	Ge	Ti	Ti	Zr	2.978	0.818	Be	Mg	Zn	Ge	Ti	Ti	Zr	3.580	0.335		
Ba	Cd	Ge	Hf	Al	Al	Al	In	1989	0.518	Ca	Ca	Hf	Hf	Ga	In	Sc	Y	2.565	1.278	Ca	Cd	Si	Zr	Al	Al	Sc	Sc	2.978	0.944	Be	Ca	Ca	Zn	Si	Ge	Ge	Ti	3.580	0.628	
Sr	Sr	Ge	Zr	Ga	Al	In	Sc	1989	0.305	Ca	Cd	Ge	Hf	Al	Y	Y	Y	2.565	1.172	Ca	Sr	Sr	Cd	Si	Si	Ge	Ti	2.978	0.635	Mg	Mg	Sr	Ba	Si	Sn	Hf	Hf	3.580	0.519	
Ca	Ba	Si	Sn	Al	Al	Al	Sc	1989	0.515	Mg	Ba	Sn	Ge	Zr	Al	Sc	Sc	Sc	2.565	1.044	Be	Ba	Zn	Cd	Si	Si	Hf	Hf	2.978	0.716	Be	Ca	Mg	Ba	Si	Ge	Hf	Hf	3.580	0.538
Zn	Cd	Si	Hf	Ga	Ga	In	In	1989	0.529	Ba	Ba	Zn	Ge	Hf	Sc	Sc	Y	2.565	1.076	Be	Ca	Ca	Cd	Si	Si	Sn	Hf	2.978	0.725	Be	Ca	Mr	Ba	Si	Si	Sn	Zr	3.581	0.690	
Ba	Ba	Si	Zr	Ga	In	In	Y	1989	0.245	Sr	Zn	Cd	Cd	Ge	Zr	Zr	Hf	2.565	1.020	Be	Sr	Ge	Ti	Sc	Sc	Y	Y	2.978	1.055	Ca	Ca	Sr	Sr	Si	Ge	Sn	Ti	3.581	0.563	
Sr	Cd	Si	Si	Ga	Ga	In	Sc	1990	0.845	Mg	Cd	Zr	Hf	Al	Al	In	In	2.566	1.037	Be	Ba	Si	Si	Al	Al	Sc	Y	2.978	0.948	Ca	Ca	Sr	Ba	Ge	Ge	Ti	Hf	3.581	0.268	
Sr	Sr	Zn	Cd	Si	Si	Ge	Sn	1990	0.773	Ba	Ba	Ba	Cd	Ge	Ti	Zr	Hf	2.566	1.174	Be	Ba	Ba	Zn	Ge	Ge	Ti	Zr	2.978	0.785	Be	Mg	Zr	Zr	Al	Ga	Ga	Y	3.581	0.169	
Ba	Cd	Ti	Al	In	In	In	Y	1990	0.550	Sr	Ba	Hf	Hf	Al	Al	Ga	Sc	2.566	1.077	Mg	Sr	Ti	Zr	Ge	Al	Al	In	2.978	1.307	Mg	Ca	Sr	Sr	Sr	Zr	Hf	Hf	3.581	0.290	
Ba	Ba	Ba	Zn	Cd	Ge	Sn	Ti	1990	0.703	Be	Cd	Sn	Ti	Ga	Y	Y	Y	2.566	1.091	Ca	Sr	Sr	Zn	Sn	Sn	Ti	Hf	2.978	1.146	Ca	Sr	Sr	Ba	Ge	Ge	Sn	Ti	3.581	0.332	
Mg	Ba	Ba	Zr	Zr	In	In	In	Sc	1990	0.749	Mg	Zn	Si	Sn	Al	Al	Ga	Ga	2.566	1.293	Zn	Zn	Si	Ge	Al	Al	Sc	Y	2.979	0.866	Be	Mg	Sr	Ba	Zr	Hf	Hf	3.581	0.252	
Sr	Zn	Zn	Cd	Sn	In	Zr	Hf	1990	0.513	Be	Ba	Ba	Ba	Zn	Sn	Zr	Hf	2.566	1.203	Be	Mg	Si	Si	Al	In	In	Y	2.979	0.633	Mg	Mg	Sr	Ba	Ge	Sn	Zr	Zr	3.581	0.543	
Ca	Sr	Ge	Ge	Al	Ga	Y	Y	1990	0.675	Mg	Zn	Si	Sn	Al	Al	Y	Y	2.566	1.153	Zn	Cd	Ge	Hf	Al	Al	Al	Sc	2.979	0.730	Mg	Ca	Si	Ti	Al	Al	Al	Sc	3.581	1.103	
Zn	Zn	Sn	Hf	Al	Al	Al	Sc	1991	0.743	Ca	Ba	Zn	Zn	Ge	Ge	Sn	Ti	2.566	1.128	Ba	Zn	Si	Si	Al	Sc	Sc	Y	2.979	0.690	Be	Mg	Si	Si	Ge	Ga	Ga	Y	3.581	0.937	
Be	Ba	Sn	Ti	Al	Ga	Ga	Ga	1991	0.506	Be	Sr	Zr	Zr	Ga	Sc	Y	Y	2.566	1.032	Be	Zn	Ge	Ge	Al	Ga	Sc	Sc	2.979	0.727	Be	Mg	Hf	Hf	Al	Ga	Sc	Sc	3.582	0.767	
Be	Ca	Sr	Cd	Ge	Ge	Sn	Sn	1991	0.900	Mg	Ba	Ba	Zn	Zn	Ge	Sn	Hf	Hf	2.566	1.107	Mg	Cd	Si	Zr	Ga	Ga	Ga	Sc	2.979	0.874	Mg	Cd	Si	Zr	Al	Al	Al	Sc	3.582	0.468
Be	Ba	Si	Ge	Ga	Y	Y	Y	1991	0.591	Ca	Sr	Ge	Zr	Al	Al	Al	Ga	2.566	1.256	Zn	Cd	Ge	Hf	Sc	Sc	Sc	Y	2.979	0.779	Mg	Sr	Ba	Ba	Sn	Ti	Ti	Hf	3.582	0.630	
Sr	Cd	Ti	Hf	In	Ga	Y	Y	1991	0.532	Ca	Ba	Zr	Hf	Al	Al	In	In	2.566	1.086	Ca	Ca	Zr	Hf	Al	Al	Sc	Y	2.979	1.433	Be	Mg	Ba	Ba	Sn	Ti	Ti	Hf	3.582	0.466	
Zn	Zn	Sn	Zr	Ga	Ga	In	Y	1991	0.473	Ba	Zn	Si	Ge	Ga	Sc	Sc	Sc	2.566	1.144	Sr	Ba	Ti	Zr	Al	Y	Y	Y	2.979	1.371	Be	Mg	Ca	Ba	Si	Ge	Ge	Ge	3.582	0.655	
Sr	Zn	Zn	Cd	Ge	Sn	Sn	Ti	1991	0.583	Sr	Cd	Hf	Hf	Al	In	Sc	Sc	2.566	1.168	Be	Zn	Sn	Hf	Al	Al	Sc	Sc	2.979	1.243	Mg	Mg	Ca	Zn	Si	Si	Sn	Ti	3.582	0.682	
Be	Sr	Sn	Ti	Ga	Ga	Y	Y	1991	0.517	Be	Ba	Ba	Cd	Ge	Ge	Ti	Hf	2.566	1.228	Zn	Zn	Ti	Cd	Ga	In	Sc	2.979	0.764	Be	Mg	Sr	Zn	Si	Ti	Ti	Ti	3.582	0.522		
Be	Cd	Si	Sn	In	Y	Y	Y	1991	0.562	Ba	Ba	Sn	Si	Zr	Al	Al	In	2.567	1.345	Mg	Mg	Ba	Cd	Ge	Zr	Hf	Hf	2.979	0.943	Be	Zn	Ti	Hf	Al	Sc	Sc	Sc	3.582	0.554	
Ca	Sr	Sn	Hf	Al	Al	Al	Y	1992	0.579	Mg	Ba	Ge	Zr	Al	Al	Al	Sc	2.567	1.273	Be	Be	Sr	Cd	Ge	Sn	Ti	Ti	2.979	1.038	Mg	Mg	Ti	Hf	Al	Ga	Sc	Sc	3.583	0.859	
Mg	Ca	Sn	Sn	Al	Sc	Y	Y	1992	0.451	Ca	Zn	Zr	Zr	Al	Ga	In	In	2.567	1.278	Zn	Cd	Sn	Ti	Al	Al	Sc	Sc	2.979	0.872	Be	Ca	Ba	Ba	Sn	Ti	Hf	Hf	3.583	0.611	
Zn	Cd	Sn	Sn	Al	Sc	Sc	Y	1992	0.569	Be	Sr	Ba	Cd	Sn	Zr	Zr	Zr	2.567	1.398	Ca	Cd	Si	Hf	Al	Al	Sc	Sc	2.979	1.082	Be	Zn	Si	Hf	Sc	Sc	Sc	Y	3.583	0.756	
Mg	Ca	Sn	Zr	Ga	Ga	In	In	1992	0.661	Zn	Zn	Ge	Zr	Al	Al	In	Sc	2.567	1.064	Mg	Mg	Sr	Cd	Si	Ge	Ge	Zr	2.979	1.113	Be	Zn	Si	Ti	Al	Al	Ga	Ga	3.583	0.927	
Sr	Cd	Si	Ga	Ga	Ga	Sc	Sc	1992	0.894</																															

Ca	Zn	Sn	Ti	Al	Al	In	In	2.001	0.579	Mg	Cd	Ti	Ti	Al	In	Y	Y	2.573	0.770	Ca	Zn	Si	Si	Al	Al	Ga	Sc	Sc	2.985	0.961	Mg	Mg	Ba	Ba	Ge	Sn	Ti	Zr	3.594	0.659
Mg	Ca	Ge	Ge	Ga	Ga	Sc	Y	2.001	0.642	Zr	Ba	Ti	Ti	Al	Al	Ga	Sc	2.573	0.694	Ba	Cd	Si	Ti	Ga	Sc	Sc	Sc	2.986	0.872	Be	Mg	Mg	Zn	Si	Sn	Zr	3.594	0.481		
Sr	Ba	Ge	Ti	In	In	Y	Y	2.002	0.259	Zn	Ba	Zn	Cd	Si	Ge	Sn	Ti	2.573	0.909	Be	Be	Zr	Hf	Al	Ga	Y	Y	2.986	0.652	Be	Ca	Sr	Sr	Sn	Sn	Ti	Zr	3.594	0.467	
Mg	Sr	Ge	Hf	Ga	Ga	Ga	Y	2.002	0.455	Mg	Ca	Ba	Cd	Si	Ge	Hf	Hf	2.573	1.154	Mg	Ca	Ti	Ti	Ga	Ga	In	Sc	2.986	0.786	Be	Cd	Ge	Ti	Al	Al	Al	Sc	3.594	0.532	
Ba	Ba	Ge	Ti	Al	Al	Ga	Sc	2.002	0.589	Cd	Cd	Ti	Hf	Al	Ga	Ga	Y	2.573	0.940	Be	Ba	Zn	Zn	Ge	Ge	Zr	Hf	2.986	0.803	Mg	Zn	Si	Si	Al	Al	Sc	Y	3.594	0.649	
Ca	Zn	Si	Ge	Ga	Ga	Ga	Y	2.002	0.192	Mg	Ba	Si	Al	Al	Y	Y	2.573	1.105	Mg	Ba	Ti	Hf	Al	Al	Al	Ga	2.986	0.713	Be	Mg	Zn	Zn	Si	Si	Sn	Ti	3.595	0.605		
Ca	Ca	Cd	Ge	Si	Ge	Sn	Zr	2.002	0.432	Be	Sr	Ba	Cd	Ge	Zr	Zr	2.573	1.186	Sr	Ba	Ti	Hf	Al	Al	Sc	Sc	2.986	0.900	Ca	Ca	Ba	Ba	Si	Ge	Ti	Hf	3.595	0.697		
Be	Sr	Sn	Ti	Al	Al	Ga	Ga	2.002	0.580	Ba	Zn	Hf	Hf	Al	Al	In	2.573	0.643	Ca	Ca	Ti	Hf	Al	Al	Ga	Sc	2.986	0.900	Mg	Mg	Sr	Ba	Ge	Zr	Zr	Hf	3.595	0.674		
Be	Mg	Sn	Sn	Ga	Ga	In	Sc	2.003	0.182	Sr	Sr	Zn	Cd	Si	Zr	Hf	Hf	2.573	0.661	Be	Zn	Si	Si	Al	In	In	Sc	2.986	0.709	Be	Mg	Mg	Zn	Ti	Zr	Zr	Zr	3.595	0.616	
Zn	Zn	Sn	Hf	Ga	In	In	Sc	2.003	0.389	Ca	Zn	Hf	Al	Al	Al	Ga	2.573	0.552	Be	Ca	Zr	Zr	Al	In	Sc	Sc	2.986	0.927	Be	Mg	Mg	Cd	Si	Si	Ge	Zr	3.596	0.619		
Mg	Ba	Ge	Ti	Ga	Ga	Ga	Y	2.003	0.408	Mg	Sr	Sn	Ti	Al	Al	Al	Ga	2.573	0.558	Ca	Sr	Ge	Hf	Sc	Y	Y	Y	2.986	1.036	Mg	Ca	Ca	Sr	Ge	Sn	Hf	Hf	3.596	0.508	
Ba	Ba	Si	Zr	Zr	Ga	Ga	Ga	Y	2.003	0.053	Mg	Sr	Ti	Ti	Al	In	Y	Y	2.573	0.482	Sr	Sr	Ba	Zn	Si	Si	Zr	Hf	2.986	0.745	Mg	Ca	Ca	Ba	Si	Sn	Sn	Zr	3.596	0.527
Mg	Cd	Ge	Ge	Al	Al	Ga	In	2.003	0.371	Ca	Zn	Zr	Zr	In	In	Sc	Y	2.573	0.294	Ca	Ba	Ba	Zn	Si	Si	Sn	Hf	2.986	1.035	Mg	Mg	Ca	Zn	Ge	Zr	Hf	Hf	3.596	0.522	
Sr	Cd	Ge	Zr	Al	Al	Ga	Ga	2.003	0.396	Mg	Ca	Si	Sn	Al	Al	Al	Ga	2.573	0.817	Be	Be	Sr	Cd	Ge	Ge	Ti	Hf	2.986	1.146	Mg	Ca	Sr	Sr	Sn	Zr	Zr	Hf	3.596	0.634	
Ca	Cd	Sn	Hf	Ga	Ga	Sc	Sc	2.004	0.035	Sr	Ba	Zr	Hf	Ga	Ga	Y	Y	2.573	0.708	Be	Ba	Si	Zr	Al	Al	Al	Sc	2.986	0.668	Be	Ba	Zn	Zn	Si	Si	Ge	Ti	3.596	0.592	
Ba	Zn	Ti	Hf	Al	In	In	In	2.004	0.574	Be	Cd	Zr	Hf	Ga	Ga	Y	Y	2.574	0.358	Mg	Sr	Zr	Hf	Al	Al	Al	Y	2.986	0.787	Be	Mg	Mg	Ba	Ge	Sn	Zr	Zr	3.596	0.674	
Ca	Ba	Ge	Ti	In	In	Y	Y	2.004	0.576	Mg	Zn	Ge	Ti	Al	Al	In	In	2.574	0.334	Sr	Sr	Si	Zr	Ga	Sc	Y	Y	2.986	0.811	Be	Mg	Zn	Zn	Ge	Ti	Hf	3.597	0.650		
Ca	Ca	Si	Sn	Al	Al	Ga	Sc	2.004	0.009	Ba	Cd	Ge	Ti	Ga	Y	Y	Y	2.574	0.343	Be	Cd	Ge	Zr	Sc	Sc	Y	Y	2.986	0.806	Be	Be	Ca	Zn	Si	Si	Ti	Zr	3.597	0.588	
Sr	Sr	Sn	Ti	Al	Al	In	Sc	2.004	0.635	Sr	Ba	Ti	Ti	Ga	In	In	Sc	2.574	0.163	Mg	Ca	Cd	Cd	Ge	Zr	Hf	Hf	2.987	0.762	Be	Be	Be	Mg	Si	Ge	Sn	Ti	3.597	0.617	
Mg	Zn	Ge	Hf	Ga	Ga	In	In	2.004	0.688	Be	Cd	Ti	Hf	In	In	Sc	2.574	0.619	Zn	Cd	Hf	Hf	Al	Al	Ga	Sc	2.987	0.706	Be	Mg	Si	Hf	Al	Ga	Ga	Ga	3.597	0.510		
Mg	Ba	Si	Ti	In	In	In	Sc	2.004	0.435	Mg	Ca	Hf	Hf	Ga	In	In	Y	2.574	0.599	Ca	Cd	Ti	Zr	Al	Al	In	In	2.987	0.966	Ca	Ba	Ba	Si	Ge	Sn	Ti	Zr	3.597	0.489	
Ca	Zn	Cd	Cd	Ge	Sn	Sn	Zr	2.004	0.505	Mg	Mg	Sn	Zr	Ga	Ga	In	Sc	2.574	0.245	Be	Be	Ba	Zn	Ge	Zr	Zr	Hf	2.987	0.906	Ca	Ca	Ca	Sr	Ge	Sn	Ti	Zr	3.597	0.598	
Mg	Mg	Si	Sn	Ga	Ga	In	In	2.005	0.636	Mg	Zn	Ti	Zr	In	In	Y	Y	2.574	0.904	Mg	Ca	Ge	Ti	Al	Al	Y	Y	2.987	0.771	Mg	Ba	Ba	Si	Sn	Ti	Hf	3.597	0.508		
Mg	Zn	Sn	Ti	Al	In	In	In	2.005	0.368	Be	Sr	Si	Hf	Ga	Y	Y	Y	2.574	0.855	Zn	Zn	Zr	Hf	Al	Ga	Ga	Y	2.987	0.655	Mg	Zn	Si	Hf	Ga	Sc	Sc	Y	3.597	0.592	
Ca	Zn	Si	Ge	Al	Al	In	In	2.005	0.482	Mg	Sr	Ge	Hf	In	Sc	Sc	Sc	2.574	0.676	Sr	Zn	Ge	Ti	Sc	Sc	Sc	Y	2.987	0.772	Mg	Cd	Zr	Hf	Al	Al	Al	Sc	3.597	0.803	
Ba	Zn	Ti	Zr	In	In	Y	Y	2.005	0.627	Be	Ba	Zn	Cd	Si	Sn	Sn	Hf	2.574	0.416	Mg	Sr	Sr	Zn	Sn	Sn	Ti	Hf	2.987	0.735	Mg	Mg	Ca	Sr	Ge	Ge	Sn	Ti	3.597	0.629	
Be	Ca	Ge	Ti	Ga	In	In	In	2.005	0.357	Ca	Sr	Ba	Cd	Ge	Ge	Ti	Zr	2.574	0.441	Mg	Mg	Zn	Cd	Si	Ge	Zr	Zr	2.987	0.697	Be	Mg	Mg	Cd	Si	Ge	Ge	Ti	3.597	0.603	
Cd	Cd	Sn	Hf	Al	In	In	Sc	2.005	0.428	Ca	Sr	Hf	Hf	Al	Ga	Ga	Y	2.574	0.418	Sr	Ba	Zn	Zn	Si	Zr	Zr	Hf	2.987	0.887	Mg	Mg	Ba	Ba	Si	Sn	Ti	Zr	3.597	0.537	
Ca	Sr	Zn	Cd	Ge	Ge	Sn	Zr	2.005	0.453	Be	Ca	Si	Hf	Ga	Ga	In	In	2.575	0.709	Mg	Mg	Zn	Zr	In	Sc	Y	Y	2.987	0.841	Be	Ba	Zn	Zn	Si	Zr	Hf	3.597	0.493		
Ca	Sr	Cd	Cd	Ge	Ge	Sn	Zr	2.005	0.243	Ca	Ca	Si	Si	Al	In	Sc	Y	2.575	0.674	Be	Ba	Zn	Zn	Cd	Ge	Ge	Sn	Ti	2.987	0.992	Mg	Mg	Sr	Zn	Ge	Ge	Ti	Zr	3.597	0.479
Mg	Ba	Si	Si	In	In	Sc	Y	2.005	0.409	Sr	Sr	Si	Ge	Al	Sc	Sc	Y	2.575	0.462	Be	Ba	Ba	Zn	Si	Si	Zr	Zr	2.987	0.966	Mg	Cd	Si	Ti	Al	Al	Sc	Sc	3.598	0.682	
Ba	Cd	Hf	Ga	In	In	Y	Y	2.006	0.441	Sr	Zn	Zn	Zr	Ga	Sc	Sc	Y	2.575	0.497	Be	Cd	Cd	Cd	Si	Sn	Zr	Hf	2.987	0.879	Be	Ca	Sr	Ba	Sn	Hf	Hf	3.598	0.500		
Cd	Cd	Ge	Hf	Al	Ga	Y	Y	2.006	0.224	Ca	Sr	Cd	Cd	Sn	Ti	Ti	Zr	2.575	0.647	Mg	Ca	Hf	Hf	Ga	Sc	Sc	Y	2.987	0.671	Be	Ca	Zn	Si	Ti	Ti	Hf	3.598	0.493		
Sr	Ba	Sn	Zr	Al	Al	Al	In	2.006	0.611	Ca	Cd	Sn	Ti	Al	Al	Sc	Sc	2.575	0.786	Mg	Sr	Cd	Cd	Ti	Ti	Zr	Hf	2.988	0.802	Be	Be	Sr	Ba	Si	Ti	Hf	3.598	0.557		
Ca	Sr	Ge	Zr	In	In	Sc	Sc	2.006	0.614	Ca	Ba	Ba	Cd	Si	Si	Sn	Zr	2.575	0.759	Ca	Sr	Ti	Ti	Al	Al	Ga	Sc	2.988	0.817	Be	Zn	Ti	Zr	Al	Al	Sc	Sc	3.599	0.667	
Ba	Ba	Ge	Hf	Al	Al	Ga	Sc	2.006	0.194	Sr	Cd	Zr	Zr	Ga	In	Sc	Sc	2.575	0.872	Be	Ca	Si	Si	Al	Al	Ga	In	2.988	0.728	Ca	Ca	Sr	Ba	Ge	Ti	Hf	3.599	0.633		
Be	Sr	Ge	Hf	Ga	Ga	Ga	In	2.006	0.436	Sr	Sr	Ge	Zr	In	Sc	Y	Y	2.575	0.843	Be	Ba	Zn	Zn	Cd	Ge	Sn	Zr	2.988	0.913	Be	Mg	Sr	Ba	Ti	Zr	Zr	Zr	3.599	0.716	
Sr	Zn	Si	Ti	Ga	Ga	In	In	2.006	0.455	Mg	Sr	Sn	Ti	Al	Al	Al	Sc	2.575	0.593	Ca	Cd	Si	Ge	Al	Ga	Sc	Sc	2.988	0.914	Zn	Cd	Si	Ti	Al	Sc	Sc	Sc	3.599	0.688	
Mg	Cd	Ge	Ti	Ga	Ga	In	In	2.007	0.577	Sr	Cd	Hf	Hf	Al	Ga	Ga	Sc	2.575	0.626	Mg	Ca	Ba	Cd	Ge	Ge	Ge	Ti	2.988	0.727	Ca	Sr	Ba	Ba	Ge	Ti	Ti	Hf	3.599	0.641	
Ca	Zn	Ge	Hf	Ga	Ga	Ga	In	2.007	0.417	Be	Sr	Ti	Zr	Ga	Ga	In	In	2.575	0.508	Ca	Sr	Ge	Zr	Sc	Sc	Y	Y	2.988	0.940	Be	Sr	Sr	Ba	Ge	Ge	Sn	Ti	3.599	0.651	
Ca	Zn	Si	Zr	Ga	In	In	In	2.007	0.442	Ca	Cd	Ge	Ti	Al	Al	In	In	2.575	0.609	Mg	Ca	Ba	Cd	Ti	Ti	Hf	Hf	2.988	1.044	Mg	Sr	Ba	Ba	Ge	Ge	Zr	Zr	3.599	0.541	
Mg	Cd	Sn	Hf	Ga	Ga	Y	Y	2.007	0.560	Ba	Ba	Zr	Hf	In	Sc	Sc	Y	2.576	0.570	Be	Ba	Zn	Zr	Ga	In	In	Sc	2.988	0.759	Be	Mg	Ca	Zn	Ti	Ti	Zr	Zr	3.600	0.560	
Ca	Ba	Sn	Zr	Ga	Ga	Y	Y	2.007	0.604	Mg	Zn	Cd	Cd	Si	Sn	Sn	Ti	2.576	0.435	Be	Be	Ba	Zn	Sn	Zr	Zr	Hf	2.988	1.044	Be	Sr	Sr	Si	Ge	Ti	Zr	3.600	0.542		
Sr	Zn	Cd	Cd	Si	Ge	Ge	Sn	2.007	0.606	Ca	Cd	Cd	Cd	Ti	Ti	Zr	Hf	2.576	0.831	Mg	Ca	Si	Si	Al	Al	Ga	Y	2.988	1.155	Mg	Ca	Ca	Ba	Sn	Zr	Hf	Hf	3.600	0.647	
Ca	Ca	Sn	Zr	Al	Ga	Ga	Sc	2.007	0.538	Be	Cd	Cd	Zr	Ga	In	In	Y	2.576	0.781	Be	Zn	Ge	Zr	Al	Ga	Ga	Ga	2.988	0.688	Be	Zn	Si	Si	Al	Al	Ga	Y	3.600	0.608	
Sr	Zn	Si	Hf	Ga	Ga	Y	Y	2.007	0.429	Ba	Zn	Si	Ge</																											

Ba	Ba	Sn	Hf	Al	Al	Sc	Y	2.018	0.987	Mg	Sr	Si	Zr	Ga	Ga	Y	Y	2.581	0.700	Sr	Ba	Ba	Zn	Si	Ti	Hf	Hf	2.994	1.040	Mg	Mg	Sr	Zn	Sn	Ti	Ti	Hf	3.611	1.385	
Ba	Zn	Ge	Hf	Al	Al	Ga	Ga	2.018	0.751	Mg	Ca	Cd	Cd	Gc	Sn	Ti	Ti	2.581	0.741	Mg	Ca	Si	Hf	Ga	Y	Y	Y	2.994	0.773	Mg	Ca	Sr	Sr	Ge	Sn	Hf	Hf	3.611	1.158	
Be	Sr	Si	Hf	Al	In	In	In	2.018	0.827	Be	Sr	Cd	Cd	Sn	Zr	Zr	Hf	2.581	0.638	Be	Ca	Si	Gc	Sn	Hf	Y	Y	2.994	1.037	Be	Mg	Zn	Zn	Ge	Ti	Zr	Zr	3.612	0.836	
Mg	Mg	Sn	Sn	Al	Ga	Ga	Sc	Y	2.019	0.844	Sr	Cd	Si	Si	Al	Al	Ga	Sc	2.581	0.645	Be	Ca	Ca	Cd	Si	Zr	Hf	Hf	2.994	1.155	Be	Be	Sr	Ba	Si	Si	Ti	Zr	3.612	0.784
Cd	Cd	Sn	Zr	Al	Ga	Ga	Sc	Y	2.019	0.786	Be	Ba	Si	Ti	Al	Ga	Ga	Y	2.581	0.553	Mg	Cd	Ge	Ti	Al	Al	In	2.994	0.777	Be	Be	Mg	Zn	Si	Ti	Ti	Zr	3.612	0.875	
Ca	Zn	Sn	Al	Al	Sc	Y	Y	2.019	0.805	Cd	Zn	Zn	Cd	Gc	Sn	Sn	Zr	2.581	0.375	Mg	Sr	Cd	Cd	Si	Zr	Hf	Hf	2.994	1.136	Be	Mg	Sr	Sr	Sn	Ti	Ti	Zr	3.612	1.146	
Ba	Cd	Si	Sn	In	Sc	Sc	Sc	2.019	0.832	Cd	Cd	Si	Hf	Al	In	Sc	Sc	2.581	0.896	Be	Sr	Cd	Cd	Si	Si	Zr	Hf	2.995	1.272	Mg	Ca	Sr	Ba	Sn	Ti	Ti	Zr	3.612	1.443	
Ca	Ca	Si	Sn	Al	Ga	Y	Y	2.019	0.769	Sr	Sr	Sr	Cd	Si	Ge	Ti	Hf	2.581	0.781	Ca	Ba	Ge	Ti	Al	Sc	Sc	Sc	2.995	0.706	Mg	Mg	Ca	Ba	Sn	Ti	Hf	Hf	3.613	1.362	
Mg	Ca	Ge	Zr	In	In	Y	Y	2.019	0.837	Ca	Sr	Ti	Ti	Al	Ga	Ga	In	2.581	0.441	Zn	Cd	Zr	Hf	In	Al	Ga	Sc	2.995	0.848	Mg	Ca	Ba	Ba	Sn	Ti	Hf	Hf	3.613	1.257	
Be	Ca	Ge	Sn	In	Sc	Sc	Sc	2.020	0.843	Be	Be	Sn	Zr	Al	Ga	Y	Y	2.581	0.382	Ca	Ca	Zn	Zn	Sn	Ti	Zr	Hf	2.995	0.886	Be	Ca	Ba	Ba	Ge	Sn	Hf	3.613	1.463		
Zn	Cd	Zr	Hf	Al	In	In	In	2.020	0.760	Sr	Zn	Zn	Zi	Si	Sn	Ti	Zr	2.581	0.431	Be	Sr	Si	Si	Al	Ga	Sc	Sc	2.995	0.928	Mg	Mg	Sr	Zn	Si	Ti	Ti	Hf	3.613	1.364	
Mg	Sr	Si	Hf	Ga	In	In	In	2.020	1.222	Be	Ba	Zr	Zr	Ga	Sc	Sc	Y	2.581	0.253	Mg	Ca	Cd	Cd	Si	Ti	Zr	Zr	2.995	0.868	Be	Mg	Ti	Zr	Al	Ga	Ga	In	3.613	0.946	
Mg	Ba	Ge	Ti	In	In	Sc	Sc	2.021	1.154	Mg	Cd	Ti	Al	In	Y	Y	Y	2.581	0.642	Ca	Sr	Zn	Zn	Ge	Ti	Zr	Zr	2.995	0.814	Be	Ca	Ba	Ba	Sn	Sn	Hf	Hf	3.614	0.898	
Sr	Zn	Ge	Hf	Ga	Ga	Sc	Sc	2.021	1.026	Mg	Cd	Gc	Sn	Al	Al	Al	Sc	2.582	0.687	Sr	Sr	Ba	Zn	Ge	Ge	Sn	Ti	2.995	1.080	Be	Be	Mg	Ba	Ge	Ge	Ti	Hf	3.614	1.088	
Sr	Cd	Zr	Hf	Al	Al	In	In	2.021	1.114	Mg	Ca	Sn	Zr	Al	Al	Al	In	Y	2.582	0.340	Sr	Ba	Ba	Zn	Ge	Ge	Ti	Hf	2.995	1.012	Be	Be	Si	Zr	Al	Al	In	Sc	3.614	1.009
Ba	Cd	Ge	Hf	Al	Al	Al	Y	2.021	1.138	Ba	Ba	Ti	Hf	Al	Al	Y	Y	2.582	0.977	Zn	Zn	Zn	Cd	Sn	Ti	Zr	Hf	2.995	0.888	Mg	Mg	Ba	Zn	Si	In	Ge	Ti	3.614	0.979	
Cd	Cd	Si	Zr	Al	In	In	Y	2.021	0.999	Sr	Sr	Ge	Hf	Al	Sc	Sc	Y	2.582	0.938	Mg	Sr	Cd	Cd	Si	Ti	Ti	Hf	2.995	0.716	Be	Be	Ge	Ti	Al	Al	Sc	Y	3.614	1.314	
Be	Zn	Sn	Zr	In	In	Y	Y	2.021	1.086	Mg	Zn	Ge	Sn	In	Sc	Sc	Sc	2.582	0.765	Mg	Ca	Ba	Cd	Ge	Ti	Ti	Hf	2.995	0.869	Mg	Mg	Ca	Ba	Ge	Sn	Hf	Hf	3.614	0.922	
Be	Ba	Ge	Cd	Ga	Ga	Ga	Y	2.021	1.131	Mg	Cd	Si	Sn	Al	Y	Y	Y	2.582	0.457	Be	Ca	Cd	Cd	Sn	Zr	Zr	Hf	2.995	0.851	Mg	Sr	Ba	Zn	Si	Si	Si	Ti	3.614	0.754	
Ca	Ba	Cd	Cd	Ge	Ge	Zr	Hf	2.022	0.991	Sr	Zn	Sn	Zr	Sc	Sc	Sc	Y	2.582	0.541	Sr	Ba	Ba	Zn	Si	Ge	Ti	Ti	2.995	0.725	Be	Mg	Zn	Cd	Si	Ti	Ti	Ti	3.614	0.678	
Zn	Cd	Ti	Zr	Ga	In	In	In	2.022	0.940	Sr	Sr	Hf	Hf	Al	Ga	Sc	Y	2.582	0.509	Zn	Zn	Zn	Cd	Si	Ge	Zr	Hf	2.995	0.976	Be	Mg	Ba	Ba	Si	Si	Ge	Ti	3.614	0.462	
Mg	Ca	Ge	Ti	Ga	In	In	In	2.022	0.969	Ca	Cd	Sn	Zr	In	Sc	Sc	Sc	2.582	0.725	Ca	Cd	Zr	Cd	Si	Al	Al	Ga	Sc	2.995	0.963	Be	Be	Si	Ti	Ga	Ga	In	Sc	3.614	0.532
Be	Cd	Ge	Ge	Ga	Ga	In	Sc	2.022	1.015	Sr	Zn	Si	Sn	Sc	Sc	Sc	Y	2.582	0.773	Be	Ca	Zr	Zr	Al	Ga	Ga	In	2.995	1.106	Be	Ca	Sr	Sr	Ge	Sn	Zr	Zr	3.614	0.466	
Be	Ba	Zr	Hf	In	In	Y	Y	2.022	0.916	Mg	Ca	Cd	Cd	Si	Ge	Hf	Hf	2.582	0.558	Mg	Mg	Ba	Cd	Ge	Zr	Zr	Hf	2.995	1.088	Mg	Ca	Ca	Sr	Ge	Sn	Zr	Zr	3.615	0.592	
Ba	Ba	Si	Ge	Al	In	Y	Y	2.022	0.956	Mg	Cd	Ge	Hf	Al	Al	Y	Y	2.582	0.539	Mg	Cd	Si	Zr	Al	Al	Ga	Ga	2.996	1.010	Mg	Ca	Zn	Zn	Si	Ti	Ti	Hf	3.615	0.537	
Ca	Ba	Si	Zr	In	In	In	Sc	2.022	0.998	Ca	Sr	Si	Ge	Ga	Sc	Sc	Sc	2.582	0.736	Be	Mg	Ge	Ti	In	Y	Y	Y	2.996	0.730	Be	Mg	Ti	Zr	Ga	Ga	Sc	Sc	3.615	0.477	
Be	Mg	Si	Sn	Al	In	In	In	2.022	0.941	Sr	Ba	Ti	Ti	Ga	In	Sc	Sc	2.582	0.863	Mg	Cd	Hf	Hf	Al	Ga	Ga	Y	2.996	0.917	Mg	Ca	Ca	Sr	Ge	Sn	Sn	Zr	3.615	0.516	
Ba	Zn	Si	Sn	Ga	Y	Y	Y	2.022	0.948	Sr	Zn	Cd	Cd	Si	Zr	Hf	Hf	2.582	0.776	Mg	Sr	Ba	Cd	Cd	Zr	Zr	Zr	2.996	0.949	Ca	Sr	Sr	Sr	Si	Ge	Sn	Ti	3.615	0.731	
Be	Sr	Si	Hf	In	In	In	Sc	2.022	0.972	Zn	Zn	Si	Sn	Al	Al	Ga	Sc	2.583	0.961	Be	Ca	Zn	Cd	Ge	Ge	Hf	2.996	0.754	Mg	Mg	Ba	Zn	Si	Ge	Ti	Ti	3.616	0.613		
Cd	Cd	Zr	Hf	Al	Ga	In	In	2.023	1.053	Ca	Ba	Zn	Zn	Si	Sn	Ti	Ti	2.583	0.925	Be	Ca	Zn	Zn	Sn	Sn	Ti	Zr	2.996	1.019	Mg	Mg	Si	Zr	Al	Al	Ga	Sc	3.616	0.660	
Ca	Sr	Sn	Hf	Al	Al	Ga	Ga	2.023	1.079	Mg	Mg	Ge	Zr	Ga	In	In	Sc	2.583	0.624	Ca	Cd	Hf	Hf	Al	Sc	Y	Y	2.996	1.052	Ca	Sr	Sr	Ba	Ge	Ti	Ti	Hf	3.616	0.752	
Ca	Zn	Si	Ge	In	In	Sc	Sc	2.023	1.295	Ca	Ba	Ba	Cd	Sn	Ti	Hf	Hf	2.583	0.682	Cd	Be	Be	Cd	Si	Ti	Zr	Hf	2.996	0.790	Mg	Zn	Ti	Hf	Ga	Sc	Sc	Sc	3.616	0.619	
Ca	Ba	Si	Hf	In	In	Sc	Sc	Y	2.023	1.029	Ca	Ba	Si	Si	Al	In	Sc	Sc	2.583	0.568	Mg	Sr	Sr	Cd	Si	Si	Ge	Zr	2.996	1.048	Mg	Ca	Ca	Ba	Sn	Zr	Zr	Hf	3.616	0.500
Be	Ba	Ti	Hf	Ga	In	In	In	2.023	1.067	Be	Ba	Si	Ge	Al	Al	Al	Sc	2.583	0.684	Ba	Cd	Ti	Zr	Ga	Sc	Sc	Sc	2.996	1.162	Mg	Mg	Ba	Ba	Ge	Ti	Zr	Hf	3.616	0.412	
Sr	Zn	Ge	Sn	Al	Al	Al	Sc	2.024	1.279	Ca	Ba	Si	Sn	Sc	Y	Y	Y	2.583	0.631	Be	Zn	Zn	Cd	Si	Sn	Hf	Hf	2.996	0.789	Be	Mg	Sr	Sr	Sn	Zr	Hf	Hf	3.617	0.431	
Sr	Sr	Sn	Ti	Al	In	In	Sc	2.024	1.038	Be	Cd	Ge	Zr	In	Y	Y	Y	2.583	0.505	Be	Cd	Si	Ge	Ga	Sc	Sc	Sc	2.996	1.144	Mg	Sr	Sr	Ba	Sn	Ti	Ti	Zr	3.617	0.533	
Sr	Cd	Zr	Hf	Ga	In	In	In	2.024	1.045	Ba	Zn	Si	Hf	Al	Al	Al	Sc	2.583	0.898	Ba	Ba	Ti	Zr	Al	Sc	Y	Y	2.996	1.278	Mg	Ca	Sr	Zn	Zr	Zr	Hf	Hf	3.617	0.739	
Mg	Sr	Ge	Sn	Al	Al	Sc	Sc	2.024	1.248	Mg	Ca	Ti	Ti	In	In	Sc	Y	2.583	0.842	Ca	Cd	Ti	Zr	Ga	Y	Y	Y	2.996	0.725	Be	Zn	Zr	Hf	Al	Al	Al	Y	3.617	0.668	
Ca	Zn	Sn	Ti	Ga	Ga	Ga	In	2.024	0.819	Ba	Cd	Hf	Hf	In	Sc	Y	Y	2.583	0.565	Be	Zn	Si	Ge	Ga	Ga	Y	Sc	2.996	0.869	Be	Mg	Ba	Zn	Si	Si	Ti	Ti	3.617	0.666	
Mg	Sr	Sn	Zr	Al	Ga	Ga	Ga	2.024	0.820	Mg	Ba	Cd	Cd	Ge	Ti	Hf	Hf	2.583	0.585	Ca	Ca	Ba	Zn	Ge	Ge	Sn	Hf	2.997	0.909	Ca	Zn	Si	Ti	Al	Sc	Sc	Sc	3.617	0.752	
Mg	Ba	Sn	Ti	Ga	Ga	Y	Y	2.024	0.812	Sr	Cd	Si	Ge	Al	Y	Y	Y	2.583	0.639	Mg	Mg	Zn	Zn	Si	Ge	Sn	Zr	2.997	1.093	Be	Be	Si	Zr	Al	Ga	Ga	In	3.617	0.660	
Sr	Zn	Zn	Cd	Si	Si	Sn	Zr	2.024	0.761	Sr	Sr	Si	Ti	Ga	Ga	Sc	Y	2.583	0.441	Be	Mg	Mg	Cd	Cd	Si	Sn	Hf	2.997	1.000	Be	Mg	Sr	Sr	Si	Ge	Ge	Hf	3.618	0.530	
Ca	Ba	Sn	Hf	Al	Al	Al	In	2.025	0.682	Be	Be	Ge	Sn	Al	In	In	Sc	2.583	0.826	Be	Ba	Cd	Cd	Si	Si	Ge	Hf	2.997	0.902	Be	Mg	Mg	Sr	Sn	Sn	Ti	Hf	3.618	0.446	
Be	Ca	Sn	Ti	Ga	Ga	In	In	2.025	0.599	Sr	Cd	Zr	Hf	Al	Al	Y	Y	2.583	0.889	Be	Ba	Cd	Cd	Si	Zr	Zr	Hf	2.997	1.275	Be	Zr	Zr	Hf	Al	Al	Ga	In	3.618	0.470	
Be	Sr	Ge	Hf	Al	Al	In	In	2.025	0.833	Ba	Zn	Ge	Hf	Sc	Sc	Sc	Y	2.583	0.531	Be	Zn	Hf	Hf	In	Sc	Sc	Y	2.997	1.166	Mg	Cd	Ti	Hf	Al	Al	Al	Ga	3.618	0.551	
Ba	Ba																																							

Zn	Cd	Si	Ge	Ga	Y	Y	2.037	0.212	Sr	Cd	Ti	Ti	Al	Al	In	Sc	2.589	0.954	Mg	Ca	Ge	Ti	Al	Al	Al	In	3.003	0.768	Be	Mg	Ba	Ba	Si	Sn	Zr	Zr	3.629	0.599		
Zn	Cd	Ti	Zr	Al	In	In	2.037	0.371	Zn	Cd	Sn	Zr	Al	Y	Y	Y	2.589	0.679	Mg	Ca	Cd	Cd	Si	Si	Ti	HF	3.003	0.928	Be	Mg	Ti	HF	Ga	Sc	Sc	3.629	0.442			
Mg	Sr	Si	Sn	Al	Al	Al	2.037	0.388	Be	Ca	Sn	Zr	Ti	In	Y	Y	2.590	0.671	Be	Ca	Zn	Zn	Si	Sn	Zr	Zr	3.003	0.975	Be	Ca	Sn	Zr	Ge	Sn	Ti	3.629	0.810			
Sr	Ba	Si	HF	Ga	In	In	2.037	0.142	Ba	Ba	Ge	Ti	Ti	Al	Al	In	2.590	0.766	Cd	Cd	Si	Ti	In	Sc	Sc	Y	3.003	0.866	Be	Mg	Mg	Sr	Ge	Sn	HF	HF	3.629	0.631		
Mg	Sr	Ba	Cd	Si	Si	Sn	2.037	0.699	Mg	Cd	Ge	Ti	Al	Al	Ga	Ga	2.590	0.557	Ca	Ba	Ge	Zr	Sc	Y	Y	Y	3.003	0.835	Mg	Mg	Ca	Ba	Ti	Zr	Zr	HF	3.629	0.267		
Ca	Cd	Ge	Zr	Al	Ga	Ga	2.037	0.632	Mg	Ba	Si	Ti	Al	Al	Ga	Ga	2.590	0.881	Be	Cd	HF	HF	Al	Al	Sc	Y	3.003	0.760	Mg	Mg	Ca	Ba	Sn	Ti	Zr	Zr	3.629	0.380		
Ba	Ba	Si	Sn	In	Sc	Y	2.037	0.417	Mg	Sr	Si	Si	Al	Al	In	Y	2.590	1.010	Mg	Ca	Ca	Cd	Sn	Ti	HF	HF	3.003	1.018	Mg	Sr	Sr	Ba	Si	Ge	Zr	Zr	3.629	0.365		
Sr	Sr	Zn	Cd	Si	Si	Sn	Zr	2.037	0.565	Ba	Cd	HF	HF	Al	Ga	Sc	2.590	0.639	Be	Ca	Si	Zr	Ga	Ga	Ga	Sc	3.003	0.972	Be	Mg	Ti	Ti	Al	In	Sc	Sc	3.629	0.293		
Sr	Ba	Si	Si	Al	In	In	2.037	0.621	Mg	Cd	Ge	Sn	Sc	Sc	Y	Y	2.590	1.045	Be	Be	Ge	HF	Ga	Sc	Y	3.003	0.793	Mg	Mg	Sr	Sr	Ge	Sn	Zr	HF	3.630	0.420			
Ba	Ba	Ge	HF	Ga	Ga	Sc	Y	2.038	0.395	Ca	Sr	Si	Ti	Al	Al	In	2.590	1.041	Be	Be	Be	Sr	Ge	Sn	Zr	HF	3.003	0.703	Be	Mg	Mg	Sr	Sn	Sn	Ti	Zr	3.630	0.612		
Ba	Ba	Ge	HF	Al	Al	In	Sc	2.038	0.539	Mg	Ba	Ge	Zr	Al	Al	Al	Ga	2.590	0.875	Ca	Zn	Zr	HF	Ga	Ga	Sc	3.004	0.795	Mg	Ca	Sr	Sr	Ge	Ge	Sn	HF	3.630	1.196		
Ca	Cd	Si	Ti	Ga	Ga	In	In	2.038	0.618	Ca	Ba	Ba	Cd	Ge	Ti	HF	HF	2.590	0.699	Zn	Cd	Ti	Zr	Al	Al	Al	In	3.004	0.733	Be	Ca	Si	Ti	Al	Al	Al	Ga	3.630	1.231	
Mg	Ca	Ge	Zr	Al	Al	In	In	2.038	0.391	Mg	Cd	Zr	HF	In	In	In	Sc	2.590	0.797	Mg	Ba	Ti	HF	Al	Al	Sc	Sc	3.004	0.735	Mg	Ca	Sr	Ba	Ge	HF	HF	HF	3.630	1.121	
Ba	Cd	Si	Sn	Al	Al	Sc	2.038	0.347	Mg	Mg	Mg	Zn	Cd	Ge	Ge	Sn	HF	2.590	0.685	Be	Mg	Ba	Zn	Sn	Sn	Zr	Zr	3.004	0.885	Mg	Mg	Sr	Zn	Ge	Ti	Ti	HF	3.630	0.659	
Be	Ba	Ge	Sn	Sc	Y	Y	2.038	0.452	Ca	Ca	Ca	Cd	Si	Sn	Zr	HF	2.590	0.917	Ca	Zn	Si	HF	Al	Al	Sc	Sc	3.004	0.796	Mg	Ca	Ba	Ba	Si	Si	Sn	Ti	3.631	1.032		
Sr	Cd	Ge	HF	Al	Al	Y	Y	2.038	0.415	Mg	Sr	Sr	Cd	Si	Sn	Ti	Ti	2.590	1.018	Be	Be	Ca	Cd	Cd	Ti	Ti	HF	3.004	1.024	Be	Be	Sr	Ba	Ge	Ge	Zr	HF	3.631	0.920	
Ca	Ca	Ge	HF	Al	Ga	In	In	2.039	0.322	Be	Sr	Ti	Ti	Ga	In	Sc	Sc	2.590	0.731	Sr	Ba	Ba	Zn	Si	Si	Sn	Ti	3.004	0.997	Mg	Ca	Ba	Ba	Si	Si	Sn	HF	3.631	0.577	
Ba	Ba	Si	Sn	Al	Al	Sc	Y	2.039	0.446	Ca	Ba	Cd	Cd	Ge	Zr	HF	HF	2.590	0.759	Mg	Ca	Ge	Zr	Si	Al	Al	Sc	3.004	0.885	Be	Ca	Sr	Sr	Sn	Zr	HF	HF	3.631	1.063	
Be	Ba	Sn	Zr	Ga	Ga	Sc	Sc	2.039	0.404	Mg	Cd	Sn	Zr	Al	Al	Al	In	2.591	0.934	Mg	Ba	Zn	Zn	Ge	Ge	Ti	Zr	3.004	0.706	Be	Zn	Zn	Zn	Si	Ge	Zr	HF	3.632	0.949	
Be	Ba	Ti	Zr	In	In	Y	Y	2.039	0.400	Sr	Cd	Ti	HF	Al	Al	Y	Y	2.591	0.977	Ca	Ca	Ti	HF	Ga	Sc	Sc	Y	3.004	0.790	Mg	Ca	Ca	Sr	Si	Sn	HF	HF	3.632	0.777	
Ca	Sr	Ge	HF	Ga	Ga	Sc	Sc	2.039	0.419	Zn	Zn	Si	Zr	Al	In	In	Sc	2.591	0.948	Ca	Ba	Si	HF	Sc	Sc	Sc	Y	3.004	0.799	Be	Mg	Ca	Zn	Zr	Zr	HF	HF	3.632	1.105	
Sr	Sr	Si	Sn	In	Sc	Y	Y	2.039	0.329	Be	Ca	Ge	HF	Ga	Ga	Sc	Sc	2.591	1.147	Mg	Ca	Ti	Ti	Al	Ga	Ga	Y	3.004	0.755	Mg	Zn	Si	Si	Al	Al	Ga	Sc	3.632	0.861	
Cd	Cd	Sn	Ti	Al	Al	In	Sc	2.039	0.393	Sr	Sr	Si	Zr	Al	Ga	Y	Y	2.591	1.036	Be	Mg	Si	Zr	Ga	Ga	In	In	3.004	0.875	Mg	Sr	Ba	Ba	Si	Ti	HF	HF	3.632	0.707	
Mg	Zn	Ge	Sn	Al	Ga	Ga	Ga	2.039	0.498	Zn	Cd	Ge	Ti	Ga	Ga	Sc	Sc	2.591	0.867	Zn	Zn	Ge	Zr	Ga	Sc	Sc	Y	3.004	0.851	Be	Sr	Ca	Ba	Ge	Sn	HF	HF	3.632	1.154	
Ba	Zn	Si	Zr	Ga	Ga	In	In	2.039	0.741	Be	Be	Sr	Ba	Si	Ge	Sn	Sc	2.591	0.963	Ca	Cd	Si	Ge	Sc	Sc	Sc	Y	3.004	0.724	Mg	Ca	Sr	Zn	Si	Si	Ge	3.632	0.890		
Sr	Sr	Ge	HF	Ga	In	Sc	Sc	2.040	0.367	Ca	Cd	Si	Ti	Ga	Ga	Ga	Sc	2.591	0.852	Mg	Cd	Si	Zr	In	Y	Y	Y	3.004	0.892	Mg	Ca	Ba	Ba	Si	Si	Sn	Zr	3.632	0.446	
Ba	Zn	Ge	Ge	Ga	Sc	Y	Y	2.040	0.493	Be	Sr	Sr	Cd	Ge	Ge	Zr	HF	2.591	0.817	Be	Ba	Cd	Si	Si	Ti	Zr	3.004	1.014	Mg	Mg	Ca	Ba	Ge	Sn	Zr	Zr	3.633	0.587		
Ca	Zn	Sn	HF	Al	Ga	Ga	Ga	2.040	0.731	Mg	Sr	Si	Sn	Sc	Sc	Y	Y	2.591	0.759	Be	Ca	Ca	Zn	Si	Sn	Sn	Zr	3.004	0.750	Mg	Ca	Ba	Zn	Si	Si	Si	HF	3.633	0.573	
Ca	Ca	Ge	HF	Ga	In	Y	Y	2.040	0.428	Ba	Ba	Zr	Zr	Al	Ga	Sc	Y	2.591	0.648	Be	Mg	Ti	Zr	Al	In	In	In	3.004	0.972	Mg	Ca	Sr	Zn	Zr	Zr	Zr	HF	3.633	0.834	
Be	Zn	Si	Ge	In	In	Y	Y	2.040	0.446	Ca	Ca	Zn	Cd	Si	Si	Ti	Zr	2.591	1.010	Be	Sr	Ti	HF	Sc	Sc	Sc	Y	3.004	1.079	Be	Mg	Ba	Ba	Si	Zn	Ti	Ti	3.633	1.133	
Sr	Cd	Si	Sn	Ga	Y	Y	Y	2.040	0.650	Ba	Cd	Sn	Zr	Sc	Y	Y	Y	2.591	0.968	Ca	Zn	Si	Ti	In	Y	Y	Y	3.004	0.666	Mg	Mg	Ca	Ba	Si	Sn	HF	HF	3.633	0.984	
Ba	Zn	Cd	Cd	Si	Si	Sn	Ti	2.040	0.335	Sr	Zn	Zr	Zr	Al	Ga	Ga	In	2.591	0.702	Sr	Zn	Si	Ti	Al	Al	Al	Sc	3.005	0.773	Mg	Ca	Sr	Sr	Ge	Ge	Sn	Zr	3.633	1.024	
Ba	Zn	Si	Zr	In	In	Sc	Sc	2.040	0.348	Ca	Zn	Si	Si	Al	Al	In	Y	2.591	0.705	Be	Mg	Ca	Ba	Ge	Ge	Sn	Sn	3.005	0.782	Mg	Ca	Ba	Ba	Si	Si	Ge	Ge	3.633	1.180	
Zn	Zn	Ge	Sn	Al	In	Sc	Sc	2.040	0.303	Be	Mg	Ge	Ti	Ga	In	In	In	2.591	0.800	Be	Sr	Zn	Cd	Ge	HF	HF	HF	3.005	0.871	Be	Mg	Si	Zr	In	Sc	Sc	Sc	3.633	1.013	
Sr	Zn	Si	Si	Al	In	In	Sc	2.040	0.642	Be	Zn	Si	Si	Ga	In	Y	Y	2.591	0.589	Be	Be	Mg	Cd	Cd	Ge	Zr	Zr	HF	3.005	0.843	Be	Be	Mg	Ba	Ge	Ge	Ti	Zr	3.634	0.538
Ca	Zn	Zn	Cd	Ge	Sn	Sn	Zr	2.041	0.649	Mg	Sr	Si	Ge	Al	Al	Al	Ga	2.591	0.912	Mg	Cd	Zr	HF	Ga	Ga	Y	Y	3.005	0.773	Mg	Cd	Si	Ti	Ga	Sc	Sc	Sc	3.634	0.674	
Sr	Sr	Si	HF	In	In	Sc	Y	2.041	0.511	Be	Ca	Ca	Cd	Sn	Sn	Zr	HF	2.592	1.042	Mg	Mg	Sn	Ti	Al	Al	Ga	In	3.005	1.017	Mg	Ba	Zn	Zn	Ti	Zr	HF	HF	3.634	0.726	
Ba	Cd	Sn	Zr	Al	Al	Al	Ga	2.041	0.698	Be	Mg	Ge	HF	In	In	In	Sc	2.592	1.072	Be	Be	Si	Ge	Al	Ga	Y	Y	3.005	0.976	Mg	Ca	Zn	Zn	Si	Si	Ge	Ti	3.634	0.572	
Sr	Ba	Sn	Ti	Al	Al	Ga	Ga	2.041	0.712	Be	Ca	Sn	Ti	Ga	Ga	Sc	Sc	2.592	1.045	Be	Zn	Si	Zr	In	In	Sc	Sc	3.005	0.804	Mg	Mg	Ca	Sr	Sn	Sn	Ti	HF	3.634	0.721	
Sr	Ba	Ge	Ti	In	In	Sc	Sc	2.041	0.565	Be	Zn	Si	Ti	In	In	In	In	2.592	1.045	Ca	Ca	Ba	Zn	Si	Si	Ge	HF	HF	3.005	0.720	Mg	Sr	Sr	Sr	Ge	Sn	Ti	HF	3.635	0.969
Zn	Cd	Sn	Ti	Ga	Ga	Y	Y	2.041	0.564	Ca	Zn	Ge	Ti	Al	Al	Y	Y	2.592	0.881	Be	Zn	Si	Zr	Ga	Ga	Ga	In	3.005	0.813	Be	Be	Si	Ge	Al	Al	Sc	Y	3.635	1.581	
Ca	Sr	Si	Ge	Al	In	In	Sc	2.041	0.680	Mg	Ba	Ge	HF	Al	Al	Sc	Sc	2.592	0.728	Be	Ca	Si	HF	Al	Y	Y	Y	3.005	0.752	Be	Be	Mg	Zn	Si	Si	Ge	Zr	3.635	1.611	
Mg	Ca	Si	Ge	Al	Al	In	In	2.041	0.532	Mg	Zn	Cd	Cd	Ge	Sn	Sn	Ti	2.592	0.821	Be	Zn	Ge	Ge	Al	Al	Sc	Y	3.005	0.747	Mg	Ca	Zn	Zn	Si	Ti	Ti	Zr	3.635	1.505	
Ca	Cd	Ge	Sn	In	Sc	Sc	Sc	2.042	0.540	Sr	Ba	Ba	Cd	Si	Si	Sn	Ti	2.592	0.701	Sr	Ba	Ba	Zn	Ge	Ge	Ti	Zr	3.005	0.899	Mg	Mg	Sr	Sr	Sn	Ti	Zr	HF	3.635	1.110	
Ca	Zn	Sn	Ga	Ga	Ga	Y	2.042	0.673	Mg	Sr	Sr	Cd	Si	Si	Ge	HF	HF	2.592	0.943	Be	Mg	Zr	Zr	Ga	In	In	Y	3.006	0.815	Be	Zn	Zn	Cd	Si	Si	Ge	Ti	3.635	1.432	
Sr	Ba	Ti	HF	In	In	In	Y	2.042	0.526	Mg	Ba	Ba	Cd	Sn	Ti	Zr																								

Ca	Cd	Sn	Zr	Al	Al	Ga	Ga	2.051	0.576	Ca	Ba	Ti	Zr	Al	Al	In	In	2.597	0.548	Mg	Ba	Zn	Cd	Si	Zr	Zr	Zr	3.012	1.309	Mg	Mg	Sr	Ba	Ge	Ti	Hf	Hf	3.646	0.706		
Sr	Sr	Si	Ge	Al	Al	In	Sc	2.051	0.755	Ca	Cd	Cd	Cd	Si	Ge	Ti	Zr	2.597	0.950	Be	Be	Mg	Cd	Ge	Ge	Sn	Ti	3.012	1.060	Be	Mg	Ca	Zn	Zr	Zr	Hf	3.646	0.754			
Be	Cd	Sn	Ge	Al	Al	Sc	Y	2.051	0.491	Be	Zn	Cd	Cd	Si	Sn	Sn	Zr	2.597	0.948	Be	Sr	Ti	Hf	Al	Al	Al	Y	3.012	0.803	Mg	Mg	Ca	Sr	Sn	Zr	Hf	Hf	3.647	0.779		
Be	Zn	Sn	Hf	In	In	In	Y	2.052	0.553	Be	Mg	Mg	Ge	Sn	Al	Y	Y	2.597	0.759	Be	Zn	Zr	Zr	Al	Al	In	Y	3.012	0.890	Be	Mg	Ca	Zn	Zr	Hf	Hf	Hf	3.647	0.891		
Mg	Ba	Si	Si	Si	Ga	Ga	In	Y	2.052	0.748	Ca	Zn	Ti	Ti	Ti	Ga	In	In	Sc	2.597	0.740	Mg	Ba	Zn	Cd	Si	Si	Hf	Hf	3.012	0.885	Be	Be	Mg	Sr	Si	Ge	Hf	Hf	3.647	0.855
Sr	Sr	Si	Ti	Al	Al	In	Y	2.052	0.482	Ba	Zn	Ge	Ti	Al	Al	Al	Ga	2.597	0.705	Ca	Sr	Zr	Zr	Al	Sc	Y	Y	3.012	0.843	Mg	Zn	Ti	Zr	Al	Al	Sc	Sc	3.647	0.857		
Be	Mg	Ge	Sn	Ga	Ga	Y	Y	2.052	0.448	Ba	Ge	Hf	Hf	Al	Sc	Y	Y	2.597	0.578	Be	Mg	Ti	Zr	Al	In	Y	Y	3.012	0.976	Mg	Mg	Ca	Sr	Sn	Ti	Zr	3.647	0.877			
Be	Cd	Sn	Sn	Al	Al	Sc	Y	2.052	0.483	Mg	Zn	Cd	Cd	Ge	Ge	Sn	Hf	2.597	0.979	Be	Mg	Zr	Hf	Al	Y	Y	Y	3.012	0.950	Mg	Mg	Ca	Ba	Ge	Zr	Hf	Hf	3.647	0.788		
Ca	Cd	Ti	Hf	In	In	In	Y	2.052	0.328	Be	Mg	Ge	Ge	Ga	Ga	In	Sc	2.597	0.878	Zn	Cd	Ti	Zr	Ga	Ga	Sc	Sc	3.012	1.545	Be	Mg	Zn	Zr	Al	Sc	Sc	Sc	3.647	0.795		
Sr	Ba	Sn	Zr	Al	Al	Al	Sc	2.052	0.429	Sr	Cd	Si	Zr	Al	Al	Al	Y	2.597	0.576	Sr	Ba	Si	Si	Al	Sc	Sc	Y	3.012	1.486	Be	Mg	Mg	Sr	Ge	Ge	Sn	Ti	3.647	0.735		
Ba	Cd	Ge	Ti	Al	Al	Ga	Ga	2.052	0.473	Be	Be	Zn	Cd	Ge	Ge	Sn	Hf	2.598	0.745	Ca	Sr	Si	Ge	Sc	Sc	Y	Y	3.012	1.377	Be	Be	Ca	Sr	Si	Sn	Ti	3.648	0.777			
Mg	Zn	Sn	Sn	Ga	Sc	Y	Y	2.052	0.312	Be	Be	Sn	Hf	In	In	Sc	Y	2.598	0.786	Be	Be	Ca	Cd	Si	Ti	Ti	Hf	3.012	0.914	Mg	Ca	Ca	Sr	Si	Sn	Hf	Hf	3.648	0.783		
Zn	Zn	Sn	Hf	Al	Al	In	Y	2.052	0.613	Mg	Ca	Ge	Hf	Ga	Ga	Sc	Sc	2.598	0.832	Mg	Ba	Ti	Hf	Al	Al	Al	Sc	3.012	1.055	Mg	Mg	Zr	Hf	Al	Ga	Ga	Sc	3.648	0.853		
Zn	Zn	Sn	Hf	Al	Ga	Ga	In	2.052	0.617	Cd	Cd	Si	Si	Ge	Al	Al	Sc	Y	2.598	0.958	Sr	Zn	Ti	Zr	Al	Al	Sc	Sc	3.012	1.174	Mg	Mg	Ca	Zn	Si	Ti	Hf	Hf	3.648	0.910	
Sr	Cd	Sn	Ti	Al	Al	Y	Y	2.053	0.268	Be	Mg	Ge	Sn	Ga	Ga	Sc	Sc	2.598	0.974	Mg	Ca	Si	Ti	In	Y	Y	Y	3.013	0.969	Mg	Mg	Mg	Zn	Si	Ge	Zr	Hf	3.648	0.810		
Ca	Ba	Ge	Zr	Al	Ga	Ga	Sc	2.053	0.437	Ca	Sr	Si	Ti	Al	Al	Ga	Ga	2.598	0.842	Ca	Zn	Zr	Zr	Ga	Sc	Y	Y	3.013	1.139	Ca	Ca	Sr	Sr	Si	Ge	Ti	Zr	3.648	0.832		
Ca	Zn	Si	Sn	Ga	Ga	Sc	Sc	2.054	0.465	Be	Mg	Mg	Zr	In	In	Y	Y	2.598	0.859	Mg	Mg	Si	Si	Al	Ga	In	Y	3.013	1.225	Be	Mg	Mg	Zn	Ge	Ge	Zr	Hf	3.649	0.915		
Mg	Ca	Ge	Ge	Al	Ga	Ga	Sc	2.054	0.637	Ca	Ba	Hf	Hf	Al	Al	Ga	Y	2.598	0.911	Ca	Cd	Ge	Zr	Al	Sc	Sc	Sc	3.013	1.002	Be	Sr	Ba	Ba	Ge	Ge	Sn	Zr	3.649	0.796		
Ca	Sr	Si	Sn	In	Sc	Sc	Sc	2.054	0.420	Mg	Ca	Ti	Ti	Zr	In	In	Sc	2.598	0.775	Mg	Mg	Si	Hf	Al	Al	In	Y	3.013	1.261	Be	Be	Ti	Zr	Al	Al	In	Sc	3.650	0.805		
Be	Sr	Ge	Zr	Ga	Ga	Ga	In	2.054	0.455	Mg	Cd	Ti	Ti	Al	In	In	Y	2.598	0.995	Be	Ca	Ti	Ti	Al	Al	In	Y	3.013	1.483	Be	Be	Si	Hf	Al	Al	Ga	Y	3.650	0.842		
Be	Ca	Ge	Zr	Al	In	In	In	2.054	0.622	Ca	Ba	Cd	Cd	Si	Ti	Ti	Zr	2.598	0.853	Ca	Zn	Hf	Hf	In	Sc	Sc	Y	3.013	1.033	Mg	Mg	Ca	Sr	Si	Si	Sn	Ti	3.650	0.756		
Be	Ba	Ti	Zr	Ga	In	In	In	2.054	0.591	Mg	Ba	Zn	Zr	Al	Ga	In	Sc	2.598	0.549	Mg	Mg	Sn	Zr	Al	Sc	Y	Y	3.013	1.340	Be	Sr	Sr	Ba	Ge	Zr	Hf	Hf	3.650	0.796		
Be	Ca	Ge	Zr	Ga	Ga	Y	Y	2.055	0.594	Sr	Zn	Zr	Zr	Ga	Ga	Sc	Y	2.598	1.280	Be	Zn	Sn	Ti	Ga	Ga	Sc	Sc	3.013	1.549	Be	Mg	Mg	Sr	Sn	Zr	Zr	Hf	3.650	0.827		
Cd	Cd	Sn	Zr	Ga	In	Sc	Sc	2.055	0.590	Be	Sr	Si	Hf	Al	Ga	Ga	Ga	2.598	1.062	Mg	Zn	Sn	Hf	In	Sc	Sc	Sc	3.013	0.800	Mg	Ca	Sr	Sr	Ge	Sn	Ti	Zr	3.651	0.703		
Ba	Ba	Ge	Ti	Al	Al	Ga	Y	2.055	0.408	Mg	Ba	Hf	Hf	Al	Ga	Y	Y	2.599	0.599	Be	Mg	Ti	Zr	Ga	Y	Y	Y	3.013	0.895	Mg	Ba	Ba	Ba	Si	Ge	Sn	Hf	3.651	0.778		
Be	Be	Ba	Si	Si	Sn	Sn	Zr	2.055	0.407	Be	Ba	Ba	Cd	Ge	Zr	Hf	Hf	2.599	0.337	Mg	Cd	Sn	Zr	Sc	Sc	Sc	Y	3.014	0.915	Mg	Mg	Ca	Ba	Si	Sn	Zr	Zr	3.651	0.830		
Sr	Ba	Si	Si	In	In	Ga	Y	2.055	0.259	Be	Cd	Sn	Zr	Ga	Ga	Sc	Sc	2.599	0.329	Be	Cd	Zr	Zr	Al	In	Sc	Sc	3.014	0.809	Be	Mg	Sr	Ba	Sn	Ti	Ti	Ti	3.651	0.687		
Be	Ba	Ge	Ti	Ga	Ga	Sc	Y	2.055	0.492	Be	Ca	Cd	Cd	Ge	Ge	Sn	Zr	2.599	0.266	Ca	Cd	Si	Ge	Sc	Y	Y	Y	3.014	0.745	Be	Ca	Ba	Ba	Sn	Ti	Ti	Zr	3.651	0.781		
Cd	Cd	Sn	Al	Al	Sc	Sc	2.055	0.559	Be	Be	Ba	Zn	Ge	Ge	Sn	Zr	2.599	0.562	Ca	Zn	Si	Zr	Ga	Y	Y	Y	3.014	0.644	Be	Mg	Ca	Sr	Sn	Sn	Hf	Hf	3.651	0.813			
Sr	Zn	Cd	Cd	Si	Sn	Hf	Hf	2.056	0.441	Be	Ba	Ge	Zr	Al	Al	Sc	Sc	2.599	0.497	Be	Ca	Ge	Zr	Sc	Y	Y	Y	3.014	0.986	Mg	Ca	Ba	Ba	Si	Ge	Zr	Zr	3.652	0.660		
Sr	Sr	Ge	Ti	Al	Ga	In	Sc	2.056	0.619	Ba	Cd	Hf	Hf	Al	Al	Sc	Y	2.599	0.380	Be	Ca	Ge	Zr	Al	Al	Sc	Sc	3.014	0.886	Ca	Ca	Ba	Si	Ge	Zr	Zr	3.652	0.733			
Ba	Cd	Cd	Cd	Si	Sn	Ti	Zr	2.056	0.628	Be	Ca	Si	Hf	Ga	Ga	Y	Y	2.599	1.411	Mg	Cd	Zr	Zr	Al	Al	In	Sc	3.014	1.702	Mg	Ca	Ba	Ba	Si	Si	Ti	Zr	3.652	0.777		
Zn	Zn	Sn	Zr	Al	In	Ga	Sc	2.056	0.506	Ba	Cd	Si	Zr	Al	Al	Sc	Sc	2.599	1.321	Be	Ca	Cd	Cd	Ge	Ti	Zr	Zr	3.014	0.504	Be	Mg	Si	Si	Al	In	Sc	Sc	3.652	0.793		
Sr	Ba	Si	Si	Ga	Ga	Sc	In	Y	2.056	0.467	Ba	Ba	Zr	Hf	Al	In	Sc	2.599	1.150	Ba	Ba	Zn	Ti	Zr	Al	Al	Al	Sc	3.014	0.602	Be	Sr	Ba	Ba	Ti	Zr	Zr	Hf	3.652	0.868	
Ca	Ca	Si	Sn	In	Sc	Sc	Y	2.056	0.600	Ca	Sr	Cd	Cd	Sn	Zr	Hf	Hf	2.599	0.482	Ca	Zn	Ti	Hf	Al	Al	Ga	Ga	3.014	0.592	Mg	Ca	Ba	Ba	Si	Zr	Zr	Hf	3.653	0.908		
Ba	Ba	Si	Hf	Al	In	In	Sc	2.056	0.480	Mg	Zn	Sn	Zr	Ga	Ga	Ga	Y	2.600	0.562	Be	Ca	Ti	Hf	In	Ge	Sc	Sc	3.014	0.545	Be	Mg	Sr	Sr	Ti	Zr	Hf	Hf	3.653	0.821		
Mg	Ba	Si	Ti	Al	In	In	In	2.056	0.438	Ba	Cd	Cd	Ge	Zr	Sc	Sc	Sc	Y	2.600	0.755	Be	Be	Mg	Ba	Ge	Ge	Sn	Hf	3.014	0.697	Mg	Mg	Sr	Ba	Si	Ge	Ge	Ti	3.653	0.366	
Ca	Ba	Si	Ti	In	In	In	Sc	2.056	0.594	Ba	Ba	Ge	Hf	Sc	Sc	Sc	Sc	Y	2.600	0.717	Ca	Ba	Ti	Zr	Al	Y	Y	Y	3.014	0.675	Mg	Zn	Si	Hf	Sc	Sc	Sc	Sc	3.653	0.719	
Ca	Ba	Ge	Hf	Al	Al	In	In	2.056	0.475	Ca	Cd	Ge	Hf	Al	Al	Al	Sc	2.600	0.711	Be	Sr	Zn	Cd	Ge	Zr	Zr	Zr	3.014	1.022	Be	Cd	Ti	Hf	Al	Al	Al	Sc	3.654	0.633		
Sr	Zn	Ge	Hf	Al	Al	Y	Y	2.056	0.822	Ca	Sr	Ba	Cd	Si	Si	Si	Sn	2.600	0.750	Sr	Cd	Si	Si	Al	Sc	Sc	Y	3.015	0.976	Mg	Ba	Zn	Zn	Ti	Zr	Zr	Hf	3.654	0.289		
Sr	Ba	Cd	Cd	Si	Ge	Ti	Y	2.057	0.745	Be	Ca	Sn	Hf	Al	Al	Al	Y	2.600	0.576	Sr	Cd	Si	Si	Al	Sc	Y	Y	3.015	0.884	Mg	Zn	Zn	Zn	Ge	Ti	Zr	Hf	3.654	0.748		
Ba	Zn	Ti	Zr	Al	In	In	In	2.057	0.411	Sr	Ba	Ba	Cd	Cd	Sn	Zr	Hf	Hf	2.600	0.823	Zn	Cd	Cd	Cd	Si	Ge	Ti	Hf	3.015	0.540	Be	Mg	Sr	Ti	Zr	Zr	Hf	3.654	0.659		
Ca	Ba	Si	Hf	Ga	In	In	In	2.057	0.676	Mg	Ba	Hf	Hf	Al	Al	In	Y	2.600	1.164	Be	Be	Sr	Cd	Ge	Ge	Ti	Zr	3.015	0.670	Be	Mg	Sn	Ti	Al	Sc	Sc	Sc	3.654	0.498		
Be	Mg	Sn	Sn	Ga	Ga	Sc	Y	2.057	0.717	Be	Ba	Sn	Ti	Sc	Sc	Y	Y	2.600	0.783	Be	Ba	Cd	Cd	Si	Si	Ti	Hf	3.015	0.747	Be	Be	Mg	Sr	Si	Sn	Ti	Ti	3.654	0.803		
Ca	Ba	Si	Hf	Al	Al	In	In	2.057	0.373	Ca	Sr	Sn	Ti	Ga	Y	Y	Y	2.600	0.966	Mg	Mg	Sn	Ti	Ga	In	In	Sc	3.015	0.599	Mg	Mg	Ca	Ba	Si	Ge	Ge	Zr	3.655	0.570		
Ca																																									

Sr	Cd	Ti	Zr	In	In	In	Sc	2.068	0.812	Be	Ba	Ge	Ti	Al	Al	Al	Y	2.607	0.954	Mg	Mg	Si	Ge	Al	In	Sc	Sc	3.021	1.106	Be	Mg	Ca	Cd	Si	Si	Si	Ge	3.667	0.817	
Ba	Cd	Ge	Sn	Al	In	Sc	Sc	2.068	0.735	Ca	Ca	Sr	Cd	Si	Ge	Hf	Hf	2.607	0.888	Mg	Zn	Ti	Ti	Ga	Ga	In	Y	3.021	1.691	Be	Ca	Ba	Si	Sn	Sn	Zr	3.668	0.787		
Cd	Cd	Ge	Ti	Al	In	Sc	Y	2.068	0.720	Ce	Ba	Zn	Ge	Sn	Sn	Hf		2.607	0.707	Mg	Sr	Zr	Hf	Sc	Y	Y	Y	3.022	1.641	Mg	Sr	Ba	Si	Ge	Ti	Zr	3.668	0.713		
Be	Ca	Ge	Ti	In	In	Y	Y	2.068	0.801	Ca	Ba	Ba	Cd	Ge	Ge	Ti	Hf	2.607	0.814	Ca	Cd	Ti	Ti	Al	Ga	Sc	Sc	3.022	1.540	Mg	Ca	Ba	Ba	Ti	Ti	Zr	Hf	3.668	0.820	
Zn	Zn	Ge	Ge	Al	Ga	In	Sc	2.068	0.718	Ca	Ca	Ba	Cd	Sn	Sn	Ti	Hf	2.607	0.905	Ca	Ca	Si	Ti	In	Sc	Sc	Y	3.022	1.008	Mg	Ca	Ba	Ba	Si	Ti	Zr	Zr	3.668	0.789	
Ca	Zn	Ge	Zr	Ga	Ga	Ga	Y	2.068	0.841	Sr	Sr	Ba	Cd	Ge	Ge	Ti	Hf	2.607	1.016	Be	Be	Ca	Ba	Si	Ge	Ge	Sn	3.022	1.208	Be	Ca	Sr	Sr	Sn	Zr	Zr	3.668	0.782		
Ba	Zn	Zn	Cd	Si	Ge	Ge	Hf	2.068	0.853	Mg	Sr	Sr	Sn	Hf	Al	Al	Sc	Sc	2.607	1.008	Sr	Sr	Sr	Zn	Si	Ge	Ti	Zr	3.022	1.340	Be	Zn	Ge	Ti	Al	Al	Al	Y	3.668	0.923
Mg	Ba	Sn	Hf	Al	Al	Al	Y	2.068	0.663	Zn	Cd	Zn	Zr	Al	Al	Al	Y	2.607	1.073	Sr	Sr	Ba	Zn	Si	Si	Sn	Ti	3.022	1.030	Mg	Sr	Sr	Ba	Si	Zr	Hf	Hf	3.669	0.764	
Mg	Sr	Sn	Ti	Ga	Ga	Ga	Sc	2.069	0.811	Cd	Cd	Ti	Zr	Al	Al	In	Sc	2.607	1.055	Mg	Ca	Ca	Cd	Ge	Ti	Hf	Hf	3.022	1.283	Mg	Mg	Ca	Ba	Sn	Ti	Ti	Zr	3.669	0.735	
Sr	Sr	Si	Sn	Al	Al	Sc	Y	2.069	0.871	Be	Sr	Si	Hf	Ga	Ga	Sc	Sc	2.607	0.927	Zn	Cd	Si	Hf	Al	Y	Y	Y	3.022	1.397	Mg	Sr	Ba	Si	Ti	Hf	Hf		3.669	0.944	
Mg	Ca	Zn	Cd	Ge	Ge	Sn	Sn	2.069	1.082	Ca	Ba	Zr	Hf	Ga	Ga	Y	Y	2.607	0.975	Ba	Cd	Ti	Zr	Sc	Sc	Y	Y	3.022	1.100	Mg	Ca	Zn	Si	Ge	Ge	Ti		3.669	0.764	
Mg	Zn	Ge	Hf	In	In	Y	Y	2.069	0.787	Be	Ca	Ti	Ti	Zr	In	Y	Y	2.607	0.891	Mg	Ba	Si	Zr	Al	Y	Y	Y	3.022	1.406	Mg	Ca	Sr	Sr	Ge	Zr	Hf	Hf	3.669	0.637	
Zn	Cd	Si	Ti	In	In	In	Y	2.069	0.860	Be	Sr	Ge	Hf	Ga	Sc	Sc	Sc	2.607	0.848	Cd	Cd	Si	Zr	Ga	Sc	Sc	Sc	3.022	1.635	Mg	Zn	Si	Zr	Ga	Sc	Sc	Sc	3.670	0.720	
Sr	Cd	Ge	Sn	Al	Y	Y	Y	2.069	1.067	Mg	Sr	Sr	Zn	Zn	Ge	Ge	Sn	Ti	2.607	0.816	Mg	Mg	Ti	Hf	Ga	Ga	In	Y	3.023	1.097	Be	Be	Sr	Ba	Si	Zr	Hf		3.670	0.637
Sr	Ba	Ge	Zr	Al	Al	In	In	2.069	0.894	Ca	Ba	Ge	Hf	Al	Al	Ga	In		2.607	0.674	Be	Mg	Ti	Ti	Ga	In	In	Y	3.023	1.476	Be	Ca	Ba	Ba	Ti	Zr	Zr	Hf	3.670	0.750
Mg	Ba	Sn	Zr	Al	Al	Ga	Ga	2.069	0.905	Sr	Ba	Ge	Hf	Sc	Sc	Sc	Y	2.607	1.045	Be	Sr	Cd	Cd	Ge	Ge	Ti	Ti	Hf	3.023	1.707	Be	Mg	Ca	Ca	Si	Sn	Sn	Hf	3.670	0.864
Ba	Cd	Zr	Hf	In	In	Ga	Y	2.069	1.018	Cd	Cd	Ge	Ti	In	Sc	Y	Y	2.607	0.999	Zn	Cd	Zr	Zr	Al	Ga	Sc	Sc	3.023	0.870	Be	Mg	Sr	Ba	Si	Zr	Zr	Zr	3.670	0.716	
Be	Zn	Sn	Sn	In	Al	Ga	Y	2.069	0.589	Zn	Cd	Ge	Zr	Al	Al	In	2.607	0.713	Be	Be	Sr	Zn	Sn	Sn	Ti	Hf		3.023	0.989	Mg	Ca	Ca	Sr	Sn	Zr	Hf	Hf	3.670	0.710	
Ca	Cd	Sn	Ti	Al	Al	Al	Y	2.069	0.594	Ca	Ca	Sn	Zr	Al	Al	Sc	Sc	Y	2.607	0.733	Mg	Mg	Si	Ge	Al	Al	Ga	In	3.023	1.023	Be	Mg	Sr	Ba	Si	Hf	Hf	Hf	3.670	0.883
Ca	Ba	Si	Ge	Al	Al	Ga	Ga	2.069	0.501	Be	Mg	Sn	Ti	Ti	Ga	Ga	Y	Y	2.607	0.743	Be	Sr	Ti	Hf	Al	Al	Sc	Sc	3.023	0.942	Be	Mg	Ba	Ba	Ge	Ti	Hf	Hf	3.671	0.716
Ca	Zn	Ge	Sn	Ga	Y	Y	Y	2.069	0.673	Ca	Zn	Cd	Cd	Si	Si	Ge	Zr	2.607	0.582	Ca	Ba	Si	Zr	Ga	Sc	Sc	Sc	3.023	0.862	Mg	Sr	Sr	Sr	Si	Ge	Zr	Hf	3.671	0.645	
Mg	Zn	Sn	Ti	In	In	Y	Y	2.070	0.623	Be	Be	Mg	Cd	Si	Si	Ge	Sn	Sn	2.607	0.943	Mg	Zn	Zr	Zr	Al	Al	In	Y	3.023	0.763	Be	Mg	Ba	Ba	Ge	Ti	Zr	Zr	3.671	0.722
Be	Sr	Si	Zr	In	In	In	Sc	2.070	0.498	Be	Ba	Ba	Zn	Si	Sn	Hf	Hf	2.608	0.939	Be	Ca	Cd	Cd	Si	Ge	Ti	Ti	3.023	1.111	Be	Be	Ge	Ti	Al	Ga	In	3.671	0.611		
Sr	Ba	Si	Zr	Al	In	In	In	2.070	0.566	Ca	Ba	Ba	Cd	Si	Ge	Ti	Ti	2.608	0.644	Be	Ca	Sr	Hf	In	Sc	Sc	Sc	3.024	1.003	Be	Ca	Sr	Sr	Sn	Ti	Hf	3.672	0.620		
Zn	Zn	Ge	Hf	Ga	In	Y	Y	2.070	0.642	Zn	Zn	Si	Al	Al	Al	Sc	Y	2.608	1.084	Ca	Zn	Ti	Ti	In	Al	Sc	Sc	3.024	0.829	Mg	Mg	Ti	Zr	Al	Ga	Ga	Sc	3.672	0.710	
Be	Ba	Sn	Hf	Al	Al	Al	In	2.070	0.507	Mg	Sr	Si	Zr	Zr	Ga	Ga	Sc	2.608	1.053	Mg	Cd	Sn	Hf	Al	Al	Sc	Sc	3.024	0.575	Be	Ca	Ba	Ba	Si	Sn	Sn	Hf	3.673	0.792	
Mg	Ba	Zn	Cd	Cd	Sn	Hf	Hf	2.070	0.398	Ca	Sr	Cd	Cd	Ge	Ti	Ti	Hf	2.608	0.899	Be	Be	Ti	Hf	Al	Ga	Y	Y	3.024	0.711	Be	Mg	Ca	Ba	Zr	Zr	Hf	Hf	3.673	0.937	
Be	Sr	Sr	Sn	Al	Y	Y	Y	2.070	0.580	Mg	Zn	Zr	Hf	Al	In	In	In	2.608	0.763	Mg	Cd	Si	Si	Al	Al	In	Sc	3.024	0.719	Mg	Mg	Ca	Zn	Si	Sn	Ti	Ti	3.673	0.913	
Sr	Sr	Ge	Ti	Ga	Ga	In	Sc	2.070	0.446	Ca	Ca	Sr	Cd	Ge	Ge	Sn	Hf	2.608	0.741	Mg	Ca	Si	Si	In	Sc	Y	Y	3.024	0.582	Be	Ca	Sr	Sr	Sn	Ti	Zr	Zr	3.673	0.914	
Cd	Cd	Ge	Ti	Ga	Ga	In	Sc	2.071	0.369	Ca	Sr	Ge	Zr	Al	Al	Y	Y	2.608	0.700	Mg	Ba	Ti	Ti	Ti	Al	Sc	Sc	Y	3.024	0.797	Be	Mg	Ge	Ti	Al	Al	Ga	Ga	3.673	0.806
Be	Sr	Ge	Ti	In	In	Sc	Sc	2.071	0.569	Mg	Ba	Ba	Cd	Si	Ge	Ti	Ti	2.608	0.984	Be	Ca	Ca	Cd	Ga	Ga	Sc	Y	3.025	0.809	Be	Ca	Ba	Ba	Sn	Ti	Ti	Hf	3.673	0.846	
Mg	Sr	Si	Hf	Al	In	In	In	2.071	0.435	Be	Sr	Ba	Cd	Ge	Ge	Ti	Ti	2.608	0.915	Be	Be	Ca	Sr	Si	Sn	Sn	Ti	3.025	1.146	Mg	Mg	Sr	Ba	Ge	Ti	Ti	Hf	3.673	0.866	
Ba	Cd	Cd	Cd	Si	Ge	Zr	Hf	2.071	0.825	Sr	Sr	Ba	Cd	Si	Si	Sn	Ti	2.608	0.727	Mg	Cd	Hf	Hf	Al	In	Sc	Sc	3.025	1.109	Be	Mg	Mg	Ca	Ge	Sn	Hf		3.673	0.761	
Mg	Zn	Ge	Ge	Al	In	Y	Y	2.071	0.920	Mg	Ba	Hf	Hf	Al	In	Sc	Sc	2.608	0.846	Ca	Sr	Ti	Hf	Al	Al	Sc	Sc	3.025	1.026	Be	Ca	Ba	Ba	Ge	Ge	Ti	Zr	3.674	0.827	
Sr	Cd	Ti	Ti	Al	In	Y	Y	2.071	0.539	Zn	Zn	Ge	Hf	Al	In	Sc	Sc	2.608	0.929	Be	Sr	Zr	Zr	Al	Al	Ga	Sc	3.025	0.609	Be	Ba	Zn	Zn	Ti	Zr	Hf	Hf	3.674	0.832	
Sr	Zn	Ti	Hf	Ga	In	In	In	2.071	0.675	Be	Cd	Ti	Ti	Al	In	Y	Y	2.608	1.030	Ba	Cd	Ti	Ti	Al	Sc	Sc	Y	3.025	0.797	Mg	Mg	Ca	Sr	Ge	Sn	Hf	Hf	3.674	0.900	
Ca	Ca	Sn	Ti	Al	Al	In	Y	2.071	0.862	Be	Ba	Si	Hf	Al	Al	Ga	Ga	2.609	1.037	Mg	Cd	Cd	Ti	Zr	Al	Ga	Ga	3.025	0.891	Be	Be	Si	Hf	Al	Ga	Sc	Sc	3.674	0.958	
Ca	Ba	Si	Si	In	In	Sc	Y	2.071	0.467	Ca	Cd	Ge	Zr	Al	Al	Al	Ga	2.609	1.096	Be	Sr	Ti	Hf	Al	Al	Sc	Sc	3.025	0.634	Be	Be	Ca	Ba	Si	Ge	Hf	Hf	3.674	0.848	
Ca	Ba	Ge	Ti	In	In	Sc	Sc	2.071	0.649	Sr	Ba	Sn	Hf	Sc	Sc	Y	Y	2.609	1.069	Be	Zn	Si	Ti	In	Y	Y	Y	3.025	0.881	Be	Mg	Ca	Ba	Ba	Zr	Zr	Zr	Hf	3.674	0.865
Ca	Ca	Zn	Cd	Ge	Sn	Zr	Zr	2.071	0.851	Ca	Ba	Zr	Zr	Ga	In	Sc	Sc	2.609	0.963	Be	Be	Mg	Zn	Ge	Ge	Sn	Hf	3.025	0.970	Mg	Ca	Ca	Zn	Sn	Ti	Ti	Zr	3.675	0.961	
Cd	Cd	Zn	Zn	Al	In	Sc	Sc	2.072	0.455	Ca	Ba	Si	Si	Al	Al	Ga	Sc	2.609	1.013	Sr	Ba	Ba	Zn	Si	Ti	Zr	Zr	3.025	0.684	Be	Mg	Mg	Zn	Si	Zr	Hf	Hf	3.675	0.832	
Zn	Zn	Si	Ge	In	In	Sc	Y	2.072	0.593	Be	Ca	Ba	Zn	Ge	Ge	Ge	Sn	2.609	0.931	Be	Zn	Ge	Ti	Al	Al	Y	Y	3.025	0.966	Be	Mg	Mg	Sr	Si	Sn	Hf	Hf	3.675	0.837	
Be	Cd	Sn	Sn	Al	Al	Ga	Sc	2.072	0.631	Be	Ca	Si	Si	Al	In	In	Sc	2.609	1.274	Be	Zn	Si	Zr	Ga	Y	Y	Y	3.025	1.142	Mg	Sr	Sr	Ba	Si	Ti	Hf	Hf	3.675	0.886	
Ca	Ca	Sn	Ti	Ga	Ga	In	Sc	2.072	0.296	Sr	Ba	Hf	Hf	Al	Al	In	Sc	2.609	1.141	Sr	Ba	Ba	Zn	Si	Ge	Ge	Hf	3.025	0.684	Be	Mg	Mg	Sr	Si	Si	Sn	Zr	3.675	0.790	
Ca	Zn	Ge	Zr	Ga	Ga	Ga	In	2.072	0.571	Ba	Cd	Hf	Hf	Al	Al	Ga	Sc	2.609	0.875	Be	Be	Cd	Cd	Cd	Sn	Ti	Zr	Hf	3.025	1.043	Be	Mg	Ba	Ba	Si	Ti	Ti	Hf	3.675	0.842

Ca	Sr	Cd	Cd	Ge	Ge	Zr	Hf	2.082	0.435	Mg	Sr	Sr	Cd	Ge	Ge	Sn	Zr	2.614	1.143	Be	Ca	Zr	Zr	Ga	Ga	In	Sc	3.031	0.717	Mg	Mg	Sr	Ba	Si	Ti	Ti	Hf	3.689	0.873		
Ca	Sr	Si	Hf	Al	In	In	In	2.082	0.473	Be	Zn	Si	Sn	Al	Y	Y	Y	2.614	1.121	Be	Zn	Ti	Ti	Ga	In	In	Sc	3.032	1.016	Mg	Ca	Ca	Ba	Ge	Ge	Sn	Zr	3.689	0.989		
Be	Mg	Si	In	In	In	In	Sc	2.082	0.588	Mg	Ca	Si	Ge	Ti	Ga	Ga	Ga	2.614	0.940	Be	Ca	Ba	Zn	Ge	Ge	Hf	Hf	3.032	1.120	Mg	Ca	Sr	Sr	Si	Sn	Ti	Ti	3.689	1.187		
Sr	Zn	Zn	Cd	Si	Ge	Ge	Sn	2.082	0.840	Ca	Ba	Ba	Cd	Ge	Ge	Ti	Zr	2.614	1.011	Sr	Cd	Ti	Hf	Ca	Sc	Sc	Sc	3.032	0.791	Mg	Mg	Ca	Sr	Si	Sn	Hf	Hf	3.689	0.951		
Be	Sr	Ge	Sn	Al	Sc	Sc	Sc	2.083	0.446	Be	Zn	Si	Ti	In	In	In	Y	2.614	0.932	Be	Sr	Si	Zr	Sc	Y	Y	Y	3.032	1.099	Be	Be	Mg	Ca	Sn	Sn	Ti	Hf	3.690	0.641		
Ca	Cd	Si	Si	In	In	In	Sc	2.083	0.583	Ca	Zn	Sn	Ti	In	Y	Y	Y	2.615	0.918	Be	Sr	Ba	Zn	Ge	Ge	Ti	Ti	3.032	1.285	Be	Mg	Mg	Ba	Si	Si	Sn	Ti	3.690	0.596		
Cd	Cd	Ge	Hf	Al	Al	In	Sc	2.083	0.830	Be	Zn	Si	Hf	Al	Al	In	In	2.615	0.870	Be	Mg	Zn	Zn	Sn	Sn	Zr	Hf	3.032	0.756	Mg	Mg	Si	Zr	Al	Sc	Sc	Y	3.690	0.699		
Mg	Cd	Si	Sn	Ga	Ga	Ga	Sc	2.083	0.493	Sr	Cd	Sn	Ti	Ga	Sc	Sc	Sc	2.615	0.738	Sr	Sr	Ba	Zn	Si	Ti	Hf	Hf	3.032	1.158	Mg	Mg	Mg	Ba	Si	Sn	Ti	Ti	3.690	0.946		
Ca	Ca	Si	Sn	Al	Ga	Ga	Ga	2.083	0.514	Be	Zn	Si	Ge	Ga	Y	Y	Y	2.615	1.107	Mg	Zn	Si	Hf	Al	Al	Y	Y	3.032	1.367	Mg	Mg	Mg	Sr	Si	Ge	Zr	Hf	3.690	1.203		
Sr	Zn	Zr	Hf	In	In	In	Y	2.083	0.742	Be	Ca	Cd	Ge	Sn	Hf	Hf	Hf	2.615	1.054	Sr	Cd	Si	Zr	Sc	Sc	Y	Y	3.032	0.661	Mg	Sr	Sr	Si	Ge	Sn	Hf	3.691	1.117			
Ba	Si	Zr	In	In	In	Sc	Y	2.084	0.396	Be	Sr	Zr	Zr	Ga	Ga	In	Y	2.615	0.783	Ca	Ba	Si	Ti	Ga	Y	Y	Y	3.032	0.806	Be	Mg	Mg	Ca	Si	Sn	Hf	3.691	1.103			
Sr	Cd	Hf	Hf	Al	In	In	Y	2.084	0.410	Be	Cd	Zr	Zr	Al	In	In	Y	2.615	0.760	Mg	Cd	Ti	Ti	In	Sc	Y	Y	3.032	0.856	Be	Sr	Sr	Sr	Ge	Sn	Ti	Hf	3.691	1.289		
Be	Zn	Sn	Sn	Al	Al	In	Sc	2.084	0.378	Mg	Ba	Ba	Cd	Si	Ti	Hf	Hf	2.615	0.809	Sr	Zn	Si	Zr	Ga	Sc	Sc	Sc	3.033	1.102	Be	Be	Ti	Hf	Al	Al	Ga	Y	3.691	1.185		
Ca	Ba	Si	Si	Si	Ga	Ga	In	Y	2.084	0.819	Ca	Sr	Zr	Hf	Ga	Ga	Ga	Y	2.615	0.652	Mg	Ca	Ca	Sr	Ba	Ge	Ge	Sn	Sn	3.033	1.036	Be	Mg	Ca	Ca	Ti	Zr	Hf	Hf	3.691	0.772
Be	Ca	Ba	Zn	Si	Sn	Sn	Sn	2.084	0.826	Mg	Cd	Si	Si	Si	Ga	Ga	In	Sc	2.615	0.946	Be	Ca	Si	Zr	Al	Ga	Ga	Ga	3.033	0.969	Mg	Sr	Zn	Zn	Ti	Zr	Hf	Hf	3.691	0.729	
Sr	Ba	Si	Sn	Ga	Y	Y	Y	2.084	0.690	Sr	Zn	Si	Ge	Al	Al	Al	Ga	2.615	1.005	Ca	Ca	Si	Ti	Al	Al	Al	Sc	3.033	1.227	Mg	Sr	Ba	Ba	Ge	Ge	Ti	Zr	3.691	0.944		
Sr	Sr	Zn	Cd	Si	Ge	Ge	Hf	2.084	0.893	Ca	Ca	Zn	Cd	Si	Ti	Hf	Hf	Y	2.615	0.719	Be	Zn	Ge	Hf	Al	Al	Ga	Ga	3.033	1.154	Be	Mg	Ti	Ti	Al	Ga	Ga	Y	3.692	0.841	
Ba	Ba	Si	Hf	Ga	In	In	Sc	2.084	0.898	Be	Sr	Zr	Zr	Al	Ga	Ga	Y	2.615	1.140	Be	Be	Si	Ge	Ga	Sc	Y	Y	3.033	1.024	Be	Mg	Ti	Zr	Ga	Sc	Sc	Sc	3.692	0.815		
Mg	Ba	Cd	Cd	Ge	Sn	Sn	Hf	2.084	0.753	Sr	Sr	Si	Ti	Al	In	Sc	Sc	2.615	1.118	Mg	Mg	Si	Hf	Ga	Ga	Sc	Y	3.034	0.772	Be	Mg	Ca	Zn	Si	Si	Hf	Hf	3.692	1.167		
Ca	Cd	Si	Ti	In	In	Y	Y	2.085	0.764	Sr	Sr	Zr	Hf	Al	Ga	Ga	Sc	2.615	0.970	Be	Be	Sr	Zn	Ge	Sn	Zr	Zr	3.034	0.940	Be	Mg	Sr	Sr	Ge	Sn	Zr	Zr	3.692	1.634		
Ca	Sr	Sn	Zr	Al	Al	Ga	Sc	2.085	0.868	Sr	Ba	Ba	Cd	Ti	Ti	Zr	Hf	2.615	0.783	Mg	Zn	Ti	Hf	In	In	Sc	Sc	3.034	0.955	Be	Ca	Sr	Ba	Si	Si	Si	Ge	3.692	1.499		
Ca	Ca	Sn	Zr	Ga	In	Ga	Sc	2.085	0.722	Ca	Ca	Zn	Zn	Si	Sn	Ti	Hf	2.615	0.819	Zn	Zn	Ti	Zr	Al	Ga	Ga	Y	3.034	0.721	Be	Mg	Sr	Sr	Si	Ge	Ge	Ti	3.692	1.363		
Be	Sr	Si	Ti	In	In	In	Sc	2.085	0.739	Sr	Ba	Si	Zr	Al	Al	Al	In	2.615	0.773	Ca	Sr	Si	Zr	Al	Al	Sc	Sc	3.034	0.993	Mg	Ca	Sr	Sr	Ge	Ge	Zr	Hf	3.692	1.179		
Ca	Ca	Sn	Ti	Al	In	Y	Y	2.085	0.862	Be	Be	Sr	Cd	Si	Ge	Hf	Hf	2.615	0.980	Mg	Mg	Si	Hf	Ga	Ga	In	Sc	3.034	1.035	Be	Be	Mg	Sr	Ge	Ge	Ti	Hf	3.692	1.300		
Ca	Cd	Si	Ti	Ga	Ga	Y	Y	2.085	0.716	Mg	Ca	Si	Ge	Al	Al	Ga	Ga	2.615	0.993	Be	Cd	Ti	Ti	Ga	Ga	Sc	Y	3.034	1.225	Be	Sr	Sr	Ba	Sn	Ti	Ti	Hf	3.693	1.163		
Ca	Sr	Sn	Hf	Al	Al	Al	In	2.085	1.114	Ba	Ba	Ti	Hf	In	Sc	Sc	Y	2.615	0.805	Sr	Cd	Ti	Ti	Al	Sc	Y	Y	3.034	1.208	Mg	Mg	Ba	Ba	Si	Ge	Zr	Hf	3.693	1.304		
Be	Zn	Si	Sn	Al	Al	In	In	2.086	1.095	Sr	Sr	Ba	Cd	Sn	Ti	Zr	Zr	2.615	0.868	Mg	Ba	Ti	Hf	Sc	Y	Y	Y	3.034	1.138	Be	Mg	Mg	Ca	Ge	Sn	Sr	Zr	3.693	1.367		
Sr	Ba	Ti	Zr	In	In	In	Y	2.086	0.727	Sr	Sr	Ba	Cd	Si	Ti	Zr	Zr	2.616	0.997	Mg	Cd	Ge	Zr	Al	Al	Sc	Sc	3.034	0.765	Be	Sr	Sr	Ba	Ge	Ti	Zr	Zr	3.693	1.230		
Ca	Ba	Cd	Cd	Ge	Sn	Ti	Ti	2.086	0.997	Ba	Cd	Si	Si	Al	Al	Sc	Y	2.616	1.088	Mg	Sr	Si	Hf	Ga	Sc	Sc	Sc	3.035	0.969	Be	Ca	Sr	Sr	Si	Sn	Ti	Ti	3.693	1.223		
Sr	Sr	Zn	Cd	Ge	Sn	Ti	Ti	2.086	1.070	Zn	Zn	Sn	Hf	In	Sc	Sc	Y	2.616	1.034	Be	Be	Mg	Cd	Si	Zr	Hf	Hf	3.035	1.045	Be	Mg	Ca	Ca	Ge	Sn	Sn	Zr	3.693	1.466		
Ca	Ba	Si	Si	Al	In	In	Sc	2.086	0.689	Be	Zn	Si	Sn	Al	Al	Y	Y	2.616	1.164	Be	Be	Ca	Cd	Si	Ge	Hf	Hf	3.035	0.733	Be	Zn	Ti	Hf	Al	Al	Al	Y	3.693	1.277		
Sr	Ba	Sn	Hf	Al	Al	Al	Ga	2.086	0.974	Be	Cd	Sn	Zr	Al	Y	Y	Y	2.616	1.133	Be	Be	Ca	Cd	Sn	Ti	Zr	Zr	3.035	1.018	Be	Be	Zr	Hf	Al	Ga	Sc	Sc	3.693	1.362		
Ca	Ba	Cd	Cd	Si	Sn	Ti	Ti	2.086	1.064	Ca	Cd	Si	Si	Al	Al	In	Sc	2.616	0.975	Mg	Mg	Ba	Cd	Ti	Zr	Hf	Hf	3.035	1.117	Mg	Zn	Ti	Zr	Al	Al	Al	Y	3.693	1.548		
Be	Mg	Sn	Sn	Al	Ga	Ga	In	2.086	0.682	Ca	Ca	Ti	Zr	Al	In	In	Sc	2.616	1.048	Be	Ba	Cd	Cd	Si	Al	Ti	Hf	3.035	0.820	Be	Mg	Mg	Ba	Ti	Zr	Hf	Hf	3.693	1.341		
Ba	Zn	Hf	Hf	Ga	In	In	Y	2.086	0.779	Ca	Ba	Ba	Zr	Hf	Al	Al	Ga	Sc	2.616	0.970	Mg	Cd	Si	Ge	Al	Ti	Ga	3.035	1.094	Be	Ca	Sr	Si	Sn	Sn	Zr	3.694	1.012			
Mg	Ca	Si	Hf	In	Al	Al	Sc	2.086	0.840	Mg	Sr	Sr	Cd	Si	Ge	Zr	Zr	2.616	1.015	Ca	Zn	Ge	Ti	Al	Al	Al	Ga	3.035	1.244	Mg	Zn	Si	Ti	In	Sc	Sc	Sc	3.694	0.982		
Ca	Ba	Sn	Hf	Al	Al	Al	Sc	2.087	0.648	Ca	Cd	Si	Hf	Al	Al	Y	Y	2.616	0.914	Mg	Ca	Cd	Cd	Ge	Ti	Ti	Hf	3.035	0.764	Be	Mg	Sr	Sr	Sr	Sn	Ti	Zr	3.694	1.118		
Ba	Ba	Ge	Ti	Al	Al	In	Y	2.087	0.758	Mg	Ba	Hf	Hf	Al	Al	Ga	In	2.616	0.728	Ca	Sr	Sr	Zn	Si	Sn	Ti	Ti	3.035	1.138	Mg	Ca	Ca	Zn	Ge	Ti	Ti	Zr	3.694	1.333		
Sr	Ba	Si	Zr	Zr	Ga	In	In	2.087	0.831	Ba	Zn	Si	Zr	In	Y	Y	Y	2.616	1.230	Mg	Mg	Sn	Ti	Ga	Sc	Y	Y	3.035	1.330	Mg	Mg	Ca	Sr	Sn	Ti	Hf	Hf	3.694	1.563		
Ca	Ca	Sn	Zr	Al	Ga	Ga	Y	2.087	0.634	Ca	Ca	Ti	Zr	Zr	Ga	Ga	In	Y	2.616	1.116	Ba	Zn	Si	Zr	Al	Sc	Sc	Sc	3.035	0.726	Be	Mg	Mg	Zn	Zn	Si	Ti	Zr	3.694	1.496	
Mg	Sr	Ge	Ti	Ga	Ga	Ga	In	2.087	0.858	Sr	Cd	Ti	Zr	Al	Al	Ga	Ga	2.616	0.776	Be	Mg	Sr	Cd	Ti	Ti	Zr	Zr	3.036	0.879	Mg	Mg	Ca	Ba	Si	Si	Ge	Hf	3.694	1.461		
Mg	Cd	Ge	Ge	Ga	In	Sc	Sc	2.087	0.868	Ca	Cd	Si	Ge	In	Sc	Sc	Sc	2.617	0.630	Mg	Cd	Si	Si	Al	In	Sc	Sc	3.036	0.941	Mg	Ca	Sr	Sr	Ge	Ti	Hf	Hf	3.694	1.636		
Cd	Cd	Si	Ge	Al	Ga	Y	Y	2.087	0.581	Be	Sr	Hf	Hf	Al	Ga	Ga	In	2.617	0.716	Ca	Sr	Ba	Zn	Si	Si	Ge	Ge	3.036	1.108	Be	Ba	Zn	Zn	Ti	Zr	Zr	Hf	3.695	1.550		
Mg	Cd	Si	Hf	Al	In	In	In	2.087	1.228	Sr	Ba	Zr	Zr	Al	Ga	Ga	Sc	2.617	0.572	Mg	Sr	Sr	Zn	Si	Ge	Hf	Hf	3.036	1.045	Mg	Ca	Sr	Ba	Si	Zr	Zr	Zr	3.695	1.128		
Sr	Ba	Ge	Hf	Al	Al	Al	Y	2.087	1.198	Mg	Ba	Zn	Zn	Si	Sn	Sn	Zr	2.617	0.804	Mg	Zn	Si	Sn	Sc	Sc	Y	Y	3.036	0.983	Be	Mg	Si	Si	Al	Al	Ga	In	3.695	1.099		
Ca																																									

Sr	Zn	Cd	Cd	Si	Sn	Zr	Zr	2.098	0.671	Be	Mg	Zr	Hf	In	In	Y	Y	2.622	0.730	Be	Ca	Zr	Hf	Ga	Ga	Y	3.043	0.911	Be	Zn	Zn	Cd	Si	Si	Ti	Zr	3.708	0.645		
Sr	Zn	Ti	Zr	In	In	Y	Y	2.099	0.675	Mg	Ca	Si	Hi	Ga	Ga	Y	Y	2.622	1.090	Sr	Sr	Ba	Zn	Sn	Ti	Hf	Hf	3.043	1.046	Mg	Mg	Mg	Sr	Si	Ti	Zr	Hf	3.709	0.770	
Sr	Ba	Si	Ti	Al	In	Y	In	2.099	0.672	Be	Cd	Zr	Zr	In	In	Sc	Y	2.622	1.064	Mg	Ba	Zn	Cd	Si	Ti	Ti	Ti	3.043	0.673	Mg	Ca	Sr	Si	Si	Ge	Hf	Hf	3.709	0.722	
Ca	Zn	Ge	Ge	Al	Al	Ga	Y	2.099	0.477	Be	Ba	Ge	Hf	Sc	Sc	Y	Y	2.622	0.746	Be	Be	Ti	Hf	Ga	In	In	Y	3.043	0.773	Be	Mg	Sr	Sr	Si	Zr	Hf	Hf	3.709	0.740	
Ba	Ba	Si	Si	Al	Al	Ga	In	Y	2.099	0.477	Be	Cd	Ge	Hf	Ga	Ga	Y	Y	2.622	0.780	Be	Sr	Ba	Zn	Si	Hi	Hf	Hf	3.043	0.800	Mg	Mg	Ca	Sr	Si	Zr	Hf	Hf	3.709	0.799
Ca	Ca	Zn	Cd	Si	Sn	Ge	Sn	2.099	0.331	Ca	Ba	Ba	Cd	Si	Ti	Zr	Zr	2.623	0.801	Be	Ca	Si	Si	Al	In	Sc	Sc	3.043	0.925	Mg	Zn	Ti	Ti	Al	Al	Ga	Sc	3.710	0.732	
Be	Mg	Sn	Sn	In	In	Sc	Sc	2.100	0.565	Ca	Ba	Si	Hi	Al	Ga	Sc	Sc	2.623	0.607	Ca	Sr	Sr	Zn	Si	Si	Sn	Hf	3.043	0.918	Mg	Ca	Si	Ti	Ti	Al	Sc	Sc	3.710	0.666	
Sr	Zn	Si	Sn	Ge	Y	Y	Y	2.100	0.643	Sr	Cd	Si	Hi	Al	Al	Al	Ga	2.623	0.976	Be	Ca	Cd	Cd	Si	Ge	Ge	Ti	3.043	0.839	Mg	Mg	Ba	Ba	Si	Ge	Ti	Hf	3.710	0.616	
Ba	Zn	Zn	Cd	Si	Ge	Ge	Zr	2.100	0.527	Mg	Ba	Ba	Cd	Ge	Ge	Ti	Hf	2.623	0.987	Mg	Sr	Si	Hi	Al	Y	Y	Y	3.043	1.046	Be	Mg	Ca	Ba	Ge	Hi	Hf	Hf	3.710	0.615	
Sr	Zn	Ge	Ge	Al	Al	Sc	Y	2.100	0.708	Be	Be	Zn	Cd	Si	Sn	Sn	Ti	2.623	0.638	Mg	Ba	Zn	Zn	Si	Si	Sn	Zr	3.043	1.019	Be	Mg	Mg	Ca	Si	Sn	Sn	Zr	3.710	0.643	
Ba	Zn	Ge	Hi	Al	Al	Al	Y	2.100	0.716	Be	Ca	Ge	Hi	Ga	Ga	Sc	Sc	2.623	1.105	Sr	Ba	Ba	Zn	Si	Ge	Ge	Zr	3.043	0.836	Mg	Mg	Ca	Sr	Si	Sn	Zr	Zr	3.711	0.607	
Be	Zn	Sn	Hf	Ga	Ga	In	In	2.100	0.597	Ca	Ca	Si	Zr	Al	Ga	Ga	Sc	2.623	1.088	Be	Be	Si	Sn	Al	Ga	Ga	In	3.043	0.766	Be	Mg	Mg	Zn	Si	Ge	Zr	Zr	3.711	0.707	
Zn	Zn	Sn	Zr	Al	Ga	Ga	Y	2.101	0.552	Mg	Mg	Zn	Cd	Ge	Ge	Sn	Zr	2.623	0.911	Mg	Ba	Ti	Ti	Al	Sc	Y	Y	3.043	0.815	Mg	Mg	Ca	Sr	Si	Ge	Ge	Hf	3.711	0.936	
Ca	Sr	Ge	Zr	Ga	Ga	Ga	Sc	2.101	0.689	Ca	Ca	Zr	Zr	Ga	In	Sc	Y	2.623	0.794	Be	Be	Sr	Zn	Si	Si	Ge	Hi	3.043	0.762	Mg	Sr	Zn	Zn	Ti	Zr	Hf	Hf	3.711	0.809	
Mg	Ba	Cd	Cd	Si	Sn	Sn	Hf	2.101	0.571	Ba	Zn	Ge	Zr	Ga	Sc	Sc	Sc	2.623	0.771	Ba	Zn	Zr	Hf	Al	Al	Ga	3.043	0.774	Be	Cd	Si	Zr	Al	Al	Al	Sc	3.711	0.682		
Be	Sr	Zr	Hf	In	In	Y	Y	2.101	0.523	Mg	Ba	Zn	Cd	Cd	Ge	Ge	Sn	Zr	2.623	0.705	Zn	Cd	Si	Ti	Ga	Ga	Sc	Sc	3.043	0.855	Be	Sr	Sr	Ba	Ge	Ge	Sn	Hf	3.711	0.383
Ba	Zn	Zn	Cd	Si	Ge	Hi	Hf	2.101	0.683	Mg	Sr	Hf	Hi	Ga	In	Sc	Sc	2.624	1.004	Mg	Mg	Zn	Zn	Ge	Sn	Zr	Hf	3.044	0.781	Be	Mg	Mg	Ba	Sn	Ti	Ti	Zr	3.712	0.572	
Ca	Ba	Si	Ti	Ga	In	In	In	2.101	0.566	Sr	Ba	Ba	Cd	Ge	Zr	Zr	Hf	2.624	0.935	Zn	Cd	Ge	Ti	In	Sc	Sc	Sc	3.044	1.019	Mg	Ba	Ba	Ba	Si	Ge	Ti	Hf	3.712	0.445	
Sr	Sr	Zn	Cd	Ge	Ge	Ti	Hi	2.101	0.902	Zn	Cd	Si	Si	Al	Al	In	Y	2.624	0.700	Mg	Ca	Ca	Cd	Sn	Zr	Zr	Hf	3.044	0.987	Be	Ca	Ba	Ba	Si	Si	Sn	Hf	3.712	0.506	
Ba	Zn	Ti	Zr	In	In	In	Sc	2.101	0.815	Ca	Ca	Hf	Hi	Al	Al	Ga	In	Y	2.624	0.834	Mg	Ca	Hi	Hf	Al	Al	Ga	Y	3.044	0.876	Be	Ca	Ca	Sr	Ge	Sn	Zr	Zr	3.712	0.630
Sr	Cd	Si	Sn	In	Sc	Sc	Sc	2.101	0.491	Ba	Ba	Ge	Hi	Ga	Sc	Y	Y	2.624	0.904	Be	Mg	Ba	Ba	Si	Ge	Ge	Sn	3.044	0.742	Be	Mg	Ge	Ti	Ga	Sc	Sc	Sc	3.712	0.503	
Mg	Sr	Si	Si	In	In	Sc	Y	2.102	0.751	Mg	Mg	Si	Sn	Ga	Sc	Y	Y	2.624	0.999	Ba	Cd	Zr	Hf	Sc	Y	Y	Y	3.044	0.753	Be	Ba	Ba	Ba	Si	Ge	Sn	Hf	3.712	0.461	
Zn	Cd	Ge	Hi	Ga	Ga	Y	Y	2.102	0.788	Ca	Cd	Ge	Zr	In	Y	Y	Y	2.624	1.017	Mg	Zn	Si	Sn	Sc	Y	Y	Y	3.044	0.776	Mg	Zn	Zn	Zn	Si	Ti	Zr	Hf	3.712	0.762	
Be	Ba	Si	Ge	Ga	Ga	Sc	Sc	2.102	0.455	Ca	Sr	Zr	Zr	Al	Ga	Ga	Y	2.624	1.063	Ca	Sr	Zr	Hf	Hi	Sc	Sc	Y	3.044	0.771	Mg	Ca	Sr	Sr	Si	Si	Zr	Hf	3.712	0.551	
Mg	Ba	Ge	Hi	Al	Ga	Ga	Ga	2.102	0.722	Ca	Ba	Ti	Ti	Ga	In	Sc	Sc	2.624	1.007	Mg	Zn	Zr	Hf	Al	Al	Y	Y	3.044	0.790	Be	Mg	Si	Hi	Al	Al	Ga	Ga	3.712	0.597	
Ba	Cd	Ge	Sn	Sc	Sc	Y	Y	2.102	0.783	Sr	Ba	Sn	Zr	Sc	Sc	Y	Y	2.624	0.930	Be	Mg	Si	Zr	In	Y	Y	Y	3.044	0.785	Mg	Ca	Zn	Ti	Zr	Hf	Hf	Hf	3.712	0.836	
Cd	Cd	Si	Hi	Ga	In	In	Sc	2.102	0.448	Ca	Ba	Si	Ge	Al	Al	Y	Y	2.624	0.986	Be	Ca	Sr	Cd	Ti	Ti	Ti	Zr	3.044	0.746	Be	Ca	Ca	Sr	Sn	Sn	Ti	Hi	3.712	0.606	
Sr	Sr	Si	Zr	In	In	In	Sc	2.102	0.536	Be	Be	Ba	Cd	Sn	Sn	Zr	Hf	2.624	0.880	Be	Be	Ca	Cd	Si	Ti	Ti	Zr	3.044	0.846	Be	Mg	Sr	Sr	Si	Zr	Zr	Hf	3.712	0.306	
Mg	Ca	Sn	Zr	Ga	Ga	Ga	Y	2.102	0.642	Sr	Ba	Ba	Cd	Sn	Zr	Zr	Hf	2.625	0.919	Sr	Cd	Ti	Hi	Sc	Sc	Y	Y	3.044	0.979	Mg	Sr	Ba	Ba	Si	Si	Zr	Hf	3.712	0.272	
Ba	Cd	Hi	Hi	Ga	In	Y	Y	2.102	0.489	Ca	Ba	Ti	Ti	Ga	Ga	In	Sc	2.625	0.896	Ca	Zn	Zn	Zn	Si	Ge	Ti	Zr	3.044	0.754	Mg	Mg	Zr	Hi	Al	Al	Ga	Sc	3.712	0.324	
Ca	Ca	Ge	Zr	Al	Ga	In	In	2.103	0.598	Mg	Ba	Ba	Cd	Cd	Sn	Zr	Hf	2.625	0.754	Mg	Mg	Ca	Cd	Si	Si	Ge	Sn	3.044	0.878	Be	Sr	Ba	Ba	Si	Ti	Zr	Zr	3.713	0.549	
Ca	Sr	Si	Sn	Ga	Y	Y	Y	2.103	0.634	Mg	Ba	Ba	Cd	Ge	Ge	Ti	Zr	2.625	1.095	Be	Zn	Zn	Zr	In	Sc	Sc	Sc	3.044	1.001	Mg	Ca	Ba	Ba	Ge	Ti	Zr	Zr	3.713	0.834	
Mg	Ba	Zn	Cd	Sn	Sn	Sn	Zr	2.103	0.476	Be	Sr	Hf	Hi	Ga	Ga	Sc	Y	2.625	1.077	Mg	Mg	Sn	Ti	Al	Ga	Ga	Sc	3.044	0.700	Mg	Ca	Sr	Sr	Sn	Ti	Ti	Zr	3.713	0.734	
Ca	Cd	Ti	Zr	In	In	In	Y	2.103	0.567	Ca	Ca	Sn	Hi	Al	Sc	Y	Y	2.625	0.768	Ca	Zn	Ge	Zr	Sc	Sc	Sc	Y	3.044	0.781	Be	Mg	Si	Ti	Ga	Ga	Sc	Sc	3.713	0.675	
Ba	Zn	Zn	Cd	Si	Si	Sn	Ti	2.103	0.586	Ca	Ca	Si	Zr	Al	Al	Ga	Y	2.625	0.814	Be	Ca	Ba	Cd	Si	Si	Sn	Ti	3.045	0.795	Mg	Ca	Sr	Si	Ga	Si	Ti	Hi	3.714	0.899	
Mg	Ba	Zn	Cd	Sn	Sn	Zr	Zr	2.103	0.985	Ba	Ba	Ba	Zn	Si	Sn	Zr	Zr	2.625	0.836	Be	Sr	Zn	Cd	Cd	Sn	Ti	Ti	3.045	1.042	Mg	Ca	Ca	Ba	Ge	Zr	Zr	Hi	3.714	0.781	
Mg	Sr	Si	Ti	In	In	In	Sc	2.103	0.399	Sr	Sr	Ba	Cd	Ge	Ti	Zr	Zr	2.625	0.639	Ca	Cd	Zr	Hi	Al	Y	Y	Y	3.045	0.879	Mg	Mg	Ca	Sr	Sn	Ti	Zr	Zr	3.714	0.405	
Ca	Ba	Ge	Zr	Ga	Ga	Sc	Y	2.103	0.903	Sr	Cd	Zr	Zr	Al	In	Sc	Sc	2.625	1.007	Sr	Ba	Ti	Zr	Al	Sc	Sc	Sc	3.045	0.573	Be	Ca	Sr	Ba	Ti	Ti	Zr	Zr	3.714	0.371	
Ca	Ba	Ge	Sn	Sc	Sc	Sc	Y	2.103	0.700	Be	Be	Ca	Zn	Si	Ge	Sn	Sn	2.625	1.021	Be	Mg	Sn	Hf	Ga	Ga	Ga	Sc	3.045	1.309	Be	Mg	Mg	Cd	Si	Si	Ti	Hi	3.714	0.510	
Zn	Zn	Ge	Ti	Al	Ga	In	In	2.103	0.826	Mg	Mg	Ba	Cd	Ge	Ge	Sn	Hf	2.626	0.670	Mg	Zn	Ti	Ti	Al	In	In	Sc	3.045	1.060	Mg	Mg	Ca	Ba	Si	Si	Ge	Zr	3.714	0.474	
Mg	Ba	Si	Zr	In	In	Y	Y	2.104	0.877	Mg	Mg	Si	Sn	Al	Al	Ga	In	2.626	1.107	Be	Ca	Zn	Cd	Sn	Zr	Zr	Zr	3.045	0.614	Be	Mg	Mg	Ba	Si	Zr	Hf	Hf	3.714	0.456	
Mg	Cd	Sn	Ti	In	In	In	Sc	2.104	0.663	Ca	Cd	Sn	Hi	Al	Y	Y	Y	2.626	1.092	Mg	Ca	Zn	Cd	Ge	Hi	Hi	Hi	3.045	0.254	Mg	Ca	Zn	Si	Ti	Ti	Zr	Zr	3.714	0.748	
Ba	Zn	Sn	Ti	Al	Al	Sc	Sc	2.104	0.795	Be	Ba	Ti	Ti	Al	In	Sc	Sc	2.626	0.917	Ca	Ca	Ca	Zn	Ge	Sn	Zr	Hf	3.046	0.276	Be	Mg	Mg	Zn	Ge	Ti	Zr	Zr	3.715	1.308	
Ca	Zn	Sn	Ti	In	In	Sc	Sc	2.104	0.872	Ca	Ca	Ge	Hi	In	Sc	Y	Y	2.626	0.824	Be	Ba	Zn	Zn	Si	Ge	Hi	Hi	3.046	0.274	Be	Ca	Zn	Si	Si	Ti	Zr	Zr	3.715	1.187	
Ba	Ba	Ge	Zr	Al	Al	In	Sc	2.104	0.656	Zn	Zn	Ge	Hi	Al	Al	Ga	Y	2.627	0.795	Mg	Sr	Zn	Zn	Si	Sn	Ti	Ti	3.046	0.396	Be	Be	Mg	Ca	Sn	Sn	Ti	Zr	3.715	1.045	

Ca	Zn	Ge	Sn	Al	Al	Al	Y	2.114	0.737	Mg	Mg	Ge	Zr	Al	In	In	Sc	2.632	0.564	Mg	Zn	Si	Hf	In	Y	Y	Y	3.053	0.617	Be	Mg	Ca	Ba	Ge	Ge	Ge	Zr	3.729	0.520	
Mg	Cd	Si	Ti	Ge	In	In	In	2.114	0.613	Sr	Cd	Zr	Zr	Al	Al	Ga	Ga	Sc	2.632	0.489	Mg	Mg	Si	Sn	Al	Sc	Sc	Y	3.053	1.026	Mg	Mg	Sr	Zn	Si	Si	Ti	Zr	3.729	0.573
Ca	Sr	Cd	Cd	Si	Ge	Zr	Zr	2.114	0.662	Ba	Zn	Hf	Hf	In	Sc	Sc	Y	Y	2.633	0.731	Zn	Cd	Ge	Zr	Sc	Sc	Sc	Y	3.053	0.926	Mg	Ca	Sr	Ba	Ge	Ge	Ti	Ti	3.730	0.574
Ca	Ca	Ge	Hf	Al	Ga	Ga	In	2.114	0.754	Be	Ba	Si	Ge	Al	Sc	Sc	Sc	2.633	1.397	Mg	Mg	Ge	Zr	Al	Al	Ga	In	3.053	0.645	Be	Mg	Ti	Ti	Al	Al	Sc	Y	3.730	0.553	
Sr	Zn	Ge	Sn	Ga	Sc	Sc	Sc	2.114	0.620	Ba	Ba	Zn	Si	Si	Al	Al	Ga	Sc	2.633	1.268	Ca	Ba	Zr	Hf	Sc	Sc	Y	Y	3.053	0.524	Be	Ca	Ca	Ba	Sn	Ti	Hf	Hf	3.730	0.734
Ca	Ca	Zn	Cd	Si	Sn	Sn	Ti	2.114	0.483	Zn	Zn	Hf	Hf	Al	Ga	In	Y	2.633	1.245	Be	Sr	Ba	Cd	Si	Zr	Zr	Ti	3.053	0.565	Be	Sr	Sr	Ba	Si	Si	Sn	Ti	3.730	0.914	
Be	Sr	Ti	Ti	In	Y	Y	Y	2.115	0.689	Sr	Ba	Zn	Cd	Si	Si	Si	Zr	2.633	0.671	Be	Ba	Cd	Cd	Si	Si	Ge	Ga	3.053	0.488	Mg	Ca	Ba	Ba	Ge	Ge	Ti	Zr	3.730	0.782	
Sr	Ba	Zn	Cd	Ge	Ge	Ge	Hf	2.115	0.555	Sr	Sr	Ba	Cd	Sn	Zr	Hf	Hf	2.633	0.697	Be	Ba	Sn	Ti	Al	Al	Ga	Ga	3.053	0.646	Be	Mg	Ca	Ba	Ti	Ti	Ti	Zr	3.730	0.761	
Ca	Sr	Ti	Hf	In	In	In	Y	2.115	0.454	Sr	Ba	Ge	Hf	Ga	Y	Y	Y	2.633	1.034	Sr	Ba	Ba	Zn	Sn	Zr	Hf	Hf	3.054	0.687	Be	Be	Mg	Zn	Si	Si	Ge	Ti	3.731	0.731	
Ba	Ba	Si	Zr	Al	In	In	Sc	2.115	0.678	Sr	Zn	Ge	Zr	In	Sc	Sc	Sc	2.633	0.742	Ca	Zn	Zr	Zr	Al	Ga	Ga	Sc	3.054	0.530	Mg	Sr	Sr	Ba	Ge	Ge	Ti	Hf	3.732	0.675	
Zn	Zn	Sn	Zr	Al	Ga	Ga	In	2.115	0.544	Be	Mg	Ge	Sn	Al	Ga	Ga	Ga	2.633	0.696	Zn	Cd	Ti	Hf	Sc	Sc	Y	Y	3.054	1.051	Mg	Mg	Ca	Sr	Ge	Zr	Zr	Hf	3.732	0.660	
Be	Ba	Ge	Hf	Al	Ga	Ga	Ga	2.115	0.918	Be	Cd	Ti	Zr	In	Y	Y	Y	2.633	1.075	Mg	Zn	Ti	Ti	Al	Ga	Y	Y	3.054	1.005	Be	Mg	Ca	Zn	Si	Si	Zr	Zr	3.732	0.699	
Ca	Ba	Cd	Cd	Si	Si	Sn	Zr	2.115	1.028	Zn	Zn	Sn	Ti	Al	Al	Ga	Y	2.633	0.740	Be	Be	Sr	Zn	Zn	Zr	Hf	Hf	3.054	0.872	Be	Be	Mg	Ca	Si	Si	Sn	Ti	3.732	0.684	
Zn	Cd	Ge	Ge	Al	In	In	Sc	2.115	0.652	Sr	Ba	Ba	Cd	Si	Zr	Zr	Hf	2.633	0.967	Ca	Ba	Ba	Zn	Sn	Ti	Hf	Hf	3.054	0.543	Mg	Zn	Si	Zr	Sc	Sc	Sc	Y	3.732	0.669	
Be	Ca	Ge	Sn	Al	Al	Y	Y	2.115	0.758	Ba	Zn	Ti	Zn	Al	Al	In	Sc	2.633	1.314	Sr	Zn	Ti	Ti	Ga	Sc	Sc	Y	3.054	0.595	Mg	Mg	Ca	Ca	Ge	Ge	Zr	Zr	3.732	0.666	
Sr	Ba	Si	Si	Al	Al	Ga	In	2.116	0.968	Ca	Ba	Zn	Zn	Ge	Ge	Ti	Hf	2.633	0.787	Be	Be	Ge	Sn	Al	Al	Sc	Y	3.054	0.658	Be	Ca	Sr	Ba	Ge	Sn	Ti	Ti	3.733	0.827	
Cd	Cd	Sn	Hf	Al	Al	Ga	Sc	2.116	0.577	Ca	Ca	Sn	Zr	Al	Al	Al	In	2.633	0.963	Sr	Zn	Si	Zr	Sc	Sc	Y	Y	3.054	0.679	Mg	Sr	Sr	Ba	Si	Si	Sn	Zr	3.733	0.771	
Ca	Ca	Sn	Hf	Al	Al	Ga	Sc	2.116	0.730	Cd	Cd	Si	Ge	Al	Sc	Y	Y	2.633	1.374	Mg	Ba	Ti	Hf	Al	Al	Sc	Sc	3.054	0.699	Mg	Ca	Ca	Zn	Ti	Zr	Zr	Hf	3.733	0.742	
Ca	Cd	Ge	Zr	Ga	Ga	Ga	Sc	2.116	0.957	Sr	Ba	Zr	Hf	Ga	Ga	Ga	Sc	2.633	0.422	Sr	Zn	Ti	Zr	Al	Al	Y	Y	3.054	0.670	Be	Be	Mg	Ca	Si	Ge	Hf	3.733	0.849		
Be	Sr	Ti	Hf	Ga	In	In	In	2.116	0.565	Ca	Zn	Ti	Zr	Al	Al	In	In	2.633	0.438	Be	Zn	Ti	Ti	Ga	Sc	Y	Y	3.054	0.623	Be	Ca	Ca	Sr	Sn	Zr	Hf	Hf	3.734	0.776	
Be	Ba	Ge	Hf	Ga	Ga	Ga	Sc	2.116	0.675	Ca	Sr	Cd	Cd	Si	Ti	Ti	Hf	2.633	0.551	Ca	Ba	Ba	Zn	Si	Ti	Hf	Hf	3.054	0.792	Be	Ca	Ca	Ba	Sn	Ti	Zr	Zr	3.734	0.653	
Sr	Ba	Sn	Ti	Al	Al	Al	In	2.116	0.719	Ba	Ba	Ge	Ti	Ga	Sc	Y	Y	2.633	0.603	Mg	Sr	Zn	Cd	Ge	Ti	Ti	Ti	3.054	0.977	Mg	Ca	Ba	Ba	Ge	Ge	Ti	Hf	3.734	0.616	
Mg	Mg	Ge	Sn	Al	Ga	Y	Y	2.116	0.391	Mg	Mg	Ba	Zn	Si	Ge	Sn	Sn	2.633	0.522	Mg	Ba	Ba	Zn	Ge	Ti	Hf	Hf	3.055	0.729	Be	Mg	Ge	Hf	Al	Al	Al	Sc	3.734	0.639	
Ca	Sr	Ge	Ti	In	In	Sc	Sc	2.116	0.652	Be	Be	Zn	Cd	Ge	Ge	Sn	Zr	2.633	0.398	Be	Ca	Ge	Ti	Al	Al	Al	In	3.055	0.888	Mg	Zn	Ti	Zr	Sc	Sc	Sc	Y	3.734	0.636	
Sr	Cd	Si	Ti	Al	Al	In	In	2.116	0.706	Sr	Cd	Ge	Hf	Sc	Sc	Sc	Y	2.633	0.770	Be	Ca	Ge	Ge	Ge	Ge	Zr	Zr	3.055	1.003	Be	Mg	Ti	Hf	Ga	Ga	Ga	Sc	3.734	0.783	
Ca	Ba	Sn	Ti	Ti	Ga	Ga	Y	2.117	0.371	Ca	Ba	Ge	Ti	Al	Al	Al	Ga	2.633	0.590	Be	Ca	Ge	Hf	Al	Al	Al	Sc	3.055	0.669	Be	Mg	Mg	Sr	Ge	Zr	Zr	Hf	3.734	0.727	
Ba	Cd	Si	Si	Ga	In	Sc	Sc	2.117	0.839	Ca	Ba	Si	Zr	Al	Al	Ga	Ga	2.634	0.450	Ca	Sr	Ge	Zr	Sc	Y	Y	Y	3.055	0.733	Be	Be	Ca	Sr	Si	Ge	Zr	Zr	3.734	0.704	
Ca	Ca	Ge	Hf	Ga	Ga	In	Sc	2.117	0.844	Sr	Ba	Zr	Zr	Ga	Ga	In	Sc	2.634	0.282	Ca	Zn	Ti	Zr	Ga	Y	Y	Y	3.055	0.704	Mg	Mg	Ca	Zn	Ti	Zr	Zr	Hf	3.734	0.798	
Ca	Ca	Sn	Zr	Al	In	Sc	Sc	2.117	0.315	Be	Cd	Hf	Hf	Ga	Sc	Y	Y	2.634	0.257	Be	Mg	Mg	Cd	Sn	Sn	Ti	Hf	3.055	0.838	Be	Ca	Sr	Ge	Ge	Ti	Zr	Zr	3.734	0.722	
Ba	Zn	Ge	Ge	Ga	Sc	Sc	Y	2.117	0.977	Sr	Cd	Sn	Ti	Al	Y	Y	Y	2.634	0.362	Zn	Zn	Zr	Hf	Al	Al	Sc	Y	3.055	0.794	Be	Mg	Zn	Zn	Ge	Ti	Ti	Hf	3.735	0.634	
Sr	Cd	Ge	Ge	Ga	Sc	Sc	Y	2.117	1.075	Ca	Ba	Ba	Cd	Si	Si	Zr	Zr	2.634	0.374	Mg	Ca	Si	Hf	Al	Al	Y	Y	3.055	0.643	Mg	Ca	Sr	Ba	Ge	Ge	Ti	Ti	3.735	0.997	
Ca	Ba	Ge	Zr	Al	Al	In	In	2.117	0.832	Mg	Cd	Zr	Zr	Al	In	Y	Y	2.634	0.316	Mg	Ca	Ge	Hf	Sc	Sc	Sc	Y	3.055	1.033	Be	Ca	Sr	Ba	Zr	Hf	Hf	Hf	3.735	0.582	
Ca	Ba	Sn	Ti	Al	Al	Ga	Ga	2.117	0.815	Ca	Zn	Sn	Ti	Al	Al	Y	Y	2.634	0.453	Ca	Ba	Zn	Zn	Ge	Ti	Ti	Hf	3.055	0.941	Be	Mg	Ti	Hf	Al	Ga	Ga	Ga	3.735	0.623	
Be	Ba	Si	Ti	Ga	Ga	Sc	In	2.117	1.016	Ba	Cd	Si	Zr	Al	Al	Sc	Sc	2.634	0.809	Ca	Ba	Ba	Zn	Ge	Ti	Hf	Hf	3.055	0.669	Mg	Sr	Sr	Sr	Si	Ti	Zr	Hf	3.735	0.601	
Sr	Sr	Ge	Zr	Ga	Ga	Sc	Y	2.117	0.759	Ca	Sr	Sn	Zr	Al	Al	Sc	Sc	2.634	0.695	Be	Ca	Cd	Cd	Ge	Zr	Zr	Hf	3.055	0.560	Be	Zn	Si	Hf	Al	Al	Al	Ga	3.735	0.697	
Ba	Ba	Ge	Sn	Al	Ga	Sc	Y	2.117	0.786	Sr	Sr	Si	Ti	Al	Al	In	Sc	2.634	0.668	Mg	Ca	Si	Zr	Ga	Y	Y	Y	3.056	0.602	Be	Be	Mg	Ca	Si	Zr	Zr	Hf	3.735	0.919	
Mg	Sr	Ge	Ge	Ga	Sc	Sc	Y	2.118	1.005	Be	Ca	Ge	Hf	Al	Al	Y	Y	2.634	0.352	Ba	Ba	Zn	Si	Ti	Ga	Sc	Sc	3.056	0.522	Be	Mg	Ca	Sr	Si	Si	Si	Sn	3.736	0.788	
Cd	Cd	Si	Hf	Al	In	In	Sc	2.118	0.746	Mg	Cd	Zr	Hf	Ga	Ga	Y	Y	2.634	0.348	Mg	Ca	Hf	Hf	Al	Sc	Sc	Y	Y	3.056	0.677	Mg	Mg	Mg	Ca	Si	Ge	Sn	Hf	3.736	0.772
Ba	Cd	Si	Si	Ga	Ga	Sc	Y	2.118	0.723	Mg	Cd	Zr	Ti	Ti	Ga	Ga	In	2.634	0.542	Be	Mg	Ca	Zn	Sn	Sn	Sn	Ti	3.056	0.722	Mg	Sr	Sr	Ba	Si	Si	Sn	Hf	3.736	0.655	
Ca	Sr	Zn	Cd	Ge	Ge	Hf	Hf	2.118	0.772	Ca	Cd	Sn	Hf	Ga	Sc	Sc	Sc	2.634	0.473	Be	Be	Mg	Zn	Si	Sn	Sn	Ti	3.056	0.564	Mg	Ca	Ca	Sr	Ge	Ge	Sn	Hf	3.736	0.689	
Mg	Sr	Cd	Cd	Si	Ge	Ge	Sn	2.118	0.589	Mg	Zn	Ge	Si	Ga	In	In	Sc	2.634	0.405	Ca	Ca	Sr	Zn	Ge	Sn	Sn	Ti	3.056	1.055	Be	Mg	Zr	Hf	Al	Al	Ga	Ga	3.736	0.679	
Cd	Cd	Si	Hf	Al	Ga	Ga	In	2.118	0.699	Mg	Zn	Ge	Ge	Al	Al	Ga	Y	2.634	0.617	Zn	Cd	Ge	Zr	Al	Al	Al	Sc	3.056	1.011	Be	Mg	Sr	Sr	Ge	Sn	Ti	Ti	3.736	0.713	
Sr	Sr	Sn	Ti	Ti	Ga	Y	Y	2.118	0.758	Sr	Sr	Ba	Cd	Cd	Ge	Zr	Hf	Hf	2.634	0.407	Mg	Cd	Ge	Zr	Al	Al	Al	Ga	3.056	0.880	Mg	Zn	Zr	Hf	Al	Al	Al	Ga	3.736	0.694
Be	Zn	Sn	Ti	Al	In	In	In	2.118	0.569	Ca	Sr	Cd	Cd	Ge	Zr	Hf	Hf	2.634	0.586	Cd	Cd	Si	Ti	Al	Al	Sc	Y	3.056	0.574	Be	Ca	Zn	Zn	Si	Ti	Ti	Zr	3.736	0.686	
Ca	Zn	Sn	Zr	Ga	Ga	Ga	Sc	2.118	0.886	Be	Ca	Zr	Zr	Ga	In	Y	Y	2.634	0.802	Mg	Ca	Zn	Zn	Ge	Ge	Zr	Hf	3.056	0.621	Be	Ca	Sr	Ba	Ge	Ti	T				

Ba	Zn	Si	Hf	Ga	Ga	Sc	2.128	0.044	Sr	Cd	Si	Hf	In	Y	Y	2.640	0.864	Be	Cd	Si	Ti	Al	Ga	Ga	Ga	3.062	0.659	Be	Sr	Sr	Sr	Si	Ge	Sn	Zr	3.753	1.560		
Ba	Zn	Zr	Hf	Ga	In	In	2.128	0.157	Sr	Ba	Ti	Ti	Ga	Ga	Sc	Y	2.640	1.198	Be	Be	Si	Zr	Al	In	In	Y	3.062	0.766	Mg	Mg	Ca	Ba	Ge	Ti	Ti	Hf	3.753	1.170	
Ba	Zn	Ge	Ge	In	In	Sc	2.128	0.155	Sr	Ca	Sn	Ti	Ga	Sc	Sc	Y	2.640	0.804	Be	Be	Ge	Ti	Zr	Al	In	Y	3.062	0.624	Mg	Mg	Ca	Ba	Si	Ti	Zr	Zr	3.753	1.470	
Sr	Ba	Zn	Cd	Si	Si	Hf	2.128	0.041	Ca	Cd	Hf	Hf	Al	Ga	Ga	Y	2.640	0.859	Be	Zn	Si	Si	In	Sc	Y	Y	3.062	1.128	Be	Mg	Mg	Zn	Si	Ge	Ge	Ti	3.753	1.381	
Ca	Ca	Si	Ge	Ga	In	Sc	2.128	0.498	Ca	Ca	Hf	Zn	Si	Ge	Zr	Hf	2.640	1.246	Be	Zn	Zn	Cd	Si	Si	Sn	Zr	3.062	1.091	Be	Mg	Mg	Zn	Zn	Si	Ge	Ge	Zr	3.754	1.041
Zn	Cd	Sn	Ti	Al	Ga	Ga	2.128	0.511	Ca	Sr	Si	Sn	Sc	Y	Y	2.641	0.836	Ca	Ca	Ti	Zr	Ga	Sc	Sc	Y	3.062	0.966	Be	Zn	Zn	Zn	Si	Ti	Ti	Hf	3.754	1.478		
Be	Cd	Si	Sn	Ga	Ga	Ga	2.129	0.124	Sr	Ba	Cd	Cd	Ti	Zr	Hf	Hf	2.641	1.121	Mg	Ca	Ti	Ti	In	Sc	Sc	Y	3.062	0.578	Be	Zn	Sr	Sr	Si	Sn	Ti	Hf	3.754	1.385	
Ba	Cd	Ti	Hf	Al	Al	In	2.129	0.459	Sr	Sr	Si	Ti	Al	Al	Ga	Sc	2.641	1.461	Be	Ca	Cd	Cd	Sn	Ti	Ti	Hf	3.062	0.690	Mg	Mg	Ca	Zn	Ge	Ge	Ti	Zr	3.754	1.570	
Be	Zn	Sn	Ti	In	In	Y	2.129	0.488	Ca	Ca	Si	Si	Ge	Ga	Sc	Y	2.641	0.848	Ca	Sr	Si	Ti	Al	Al	Al	Ga	3.062	0.753	Be	Mg	Mg	Ba	Si	Ge	Ge	Hf	3.754	1.215	
Be	Sr	Sn	Hf	Al	Al	Ga	2.129	0.093	Be	Be	Ca	Zn	Ge	Sn	Sn	Zr	2.641	1.113	Mg	Mg	Sr	Cd	Si	Ge	Zr	Zr	3.062	0.686	Mg	Ca	Zn	Zr	Ti	Zr	Hf	Hf	3.755	1.307	
Cd	Cd	Si	Hf	Ga	In	Y	2.129	0.449	Be	Sr	Sr	Cd	Sn	Ti	Hf	Hf	2.641	1.527	Be	Ca	Ca	Zn	Si	Sn	Sn	Ti	3.063	0.791	Be	Be	Si	Zr	Al	Ga	Sc	Sc	3.755	1.152	
Mg	Ca	Ge	Ti	In	In	Y	2.129	0.484	Mg	Zn	Zn	Cd	Si	Sn	Sn	Ti	2.641	0.498	Mg	Cd	Si	Si	Al	Al	Ga	Sc	3.063	0.771	Be	Mg	Mg	Ba	Ge	Sn	Ti	Ti	3.755	1.541	
Ba	Cd	Si	Ge	In	Y	Y	2.129	0.088	Ca	Ca	Sr	Cd	Si	Ge	Zr	Zr	2.641	0.544	Mg	Mg	Ge	Zr	Al	Ga	Ga	Sc	3.063	0.659	Be	Be	Mg	Ca	Ti	Ti	Zr	Hf	3.755	1.312	
Be	Mg	Ge	Ge	Ga	In	Y	2.129	0.449	Sr	Sr	Ba	Cd	Ti	Ti	Zr	Hf	2.641	0.665	Be	Be	Ba	Zn	Sn	Ti	Hf	Hf	3.063	0.878	Be	Mg	Hf	Al	Ga	Ga	Sc	3.755	0.912		
Be	Ba	Cd	Cd	Sn	Sn	Zr	Hf	2.129	0.423	Be	Ba	Ti	Zr	In	Sc	Sc	2.641	0.737	Mg	Ca	Sr	Cd	Sn	Ti	Ti	Ti	3.063	1.057	Mg	Ca	Ba	Ba	Si	Si	Hf	Hf	3.755	1.071	
Sr	Sr	Ge	Sn	Al	Al	Y	2.129	0.010	Mg	Sr	Ge	Hf	Al	Al	Ga	Ga	2.641	0.636	Be	Cd	Hf	Hf	Al	Al	Ga	Ga	Y	3.063	0.738	Be	Mg	Ca	Sr	Zr	Hf	Hf	Hf	3.756	1.077
Zn	Zn	Si	Ge	Al	In	In	Sc	2.129	0.443	Be	Sr	Ti	Ti	In	Sc	Sc	Y	2.641	0.519	Be	Be	Zn	Cd	Si	Zr	Hf	Hf	3.063	0.971	Mg	Zn	Ti	Hf	Al	Al	Al	Ga	3.756	1.289
Sr	Zn	Zn	Cd	Sn	Sn	Ti	Zr	2.129	0.416	Be	Mg	Sn	Sn	Al	Al	Ga	Sc	2.641	0.894	Be	Cd	Ti	Ti	Al	Sc	Y	Y	3.063	1.088	Be	Ca	Sr	Ba	Si	Zr	Zr	Zr	3.756	1.503
Zn	Zn	Ge	Hf	Ga	Ga	In	Y	2.129	-0.002	Zn	Cd	Ti	Hf	In	In	Sc	Sc	2.641	0.705	Mg	Sr	Sr	Zn	Si	Ge	Zr	Zr	3.063	0.691	Be	Mg	Si	Hf	Al	Al	Sc	Sc	3.756	1.369
Sr	Ba	Si	Ge	Al	Al	Al	In	2.129	0.656	Mg	Mg	Si	Zr	Ga	In	In	Y	2.641	0.579	Be	Ca	Hf	Hf	Al	Al	In	Sc	3.063	0.779	Be	Mg	Ca	Ba	Si	Zr	Zr	Zr	3.757	1.178
Ba	Ba	Si	Hf	Ga	Ga	In	Y	2.129	0.652	Mg	Ca	Ca	Cd	Si	Ge	Ge	Sn	2.641	0.358	Be	Be	Sn	Hf	Al	In	Sc	Sc	3.063	0.758	Be	Zn	Si	Zr	Al	Sc	Sc	Sc	3.757	1.528
Ca	Sr	Si	Zr	Ga	In	In	2.130	0.025	Mg	Cd	Sn	Ti	Ga	Ga	Sc	Sc	2.641	0.381	Mg	Mg	Sr	Zn	Si	Sn	Sn	Ti	3.063	0.947	Be	Mg	Sr	Ba	Si	Ti	Ti	Ti	3.757	1.375	
Zn	Zn	Si	Ge	Al	In	In	Sc	2.130	0.564	Sr	Sr	Zr	Hf	In	Sc	Sc	Y	2.641	0.494	Be	Ba	Ba	Zn	Si	Ge	Ge	Hf	3.063	0.866	Be	Be	Mg	Ca	Si	Sn	Zr	Zr	3.757	0.968
Cd	Cd	Si	Ge	Al	Al	In	Sc	2.130	0.574	Be	Be	Si	Sn	Al	Ga	In	In	2.641	0.415	Be	Ba	Ca	Sr	Ge	Ge	Sn	Hf	3.064	0.722	Be	Ca	Ba	Ba	Ge	Ti	Zr	Zr	3.757	1.119
Mg	Zn	Sn	Hf	Al	Al	In	Y	2.130	0.303	Mg	Cd	Ge	Hf	Ga	Ga	Sc	2.641	0.435	Mg	Sr	Sr	Zn	Ge	Ge	Zr	Hf	3.064	1.113	Mg	Ca	Ba	Zn	Si	Si	Si	Ti	3.757	1.170	
Be	Cd	Ge	Sn	Al	Al	Y	2.130	0.510	Sr	Cd	Si	Hf	Al	Al	Sc	Sc	2.641	0.590	Be	Cd	Ti	Hf	Sc	Sc	Y	Y	3.064	1.013	Be	Mg	Si	Zr	Ga	Sc	Sc	Sc	3.757	0.980	
Zn	Zn	Sn	Hf	Ga	Ga	In	Sc	2.130	0.548	Sr	Ba	Ti	Ti	In	Sc	Sc	2.641	0.926	Zn	Cd	Ti	Hf	Sc	Si	Y	Y	3.064	0.755	Mg	Zn	Si	Si	Al	Sc	Sc	Y	3.758	1.144	
Ca	Ca	Sn	Zr	Al	Al	Ga	In	2.130	0.265	Be	Mg	Cd	Cd	Ge	Sn	Sn	Ti	2.641	0.823	Ca	Ba	Ba	Zn	Si	Si	Y	Ti	3.064	0.599	Be	Zn	Si	Si	Al	Sc	Al	Y	3.758	1.372
Be	Ba	Zr	Hf	In	In	In	Y	2.131	0.497	Zn	Cd	Ti	Hf	In	Y	Y	2.641	0.803	Ca	Sr	Zn	Zn	Hf	In	Ti	Ti	Hf	3.064	0.681	Mg	Mg	Ca	Zn	Sn	Ti	Ti	Hf	3.758	0.953
Be	Cd	Ge	Hf	In	In	In	Sc	2.131	0.542	Be	Mg	Ba	Zn	Sn	Sn	Y	Hf	2.642	0.418	Mg	Zn	Zr	Hf	In	In	Sc	Sc	3.064	0.609	Be	Sr	Zn	Zn	Ti	Zr	Zr	Hf	3.758	0.961
Ca	Sr	Si	Ti	Ga	In	In	Y	2.131	0.258	Sr	Ba	Ba	Cd	Si	Si	Ti	Hf	2.642	0.486	Zn	Zn	Ti	Hf	Al	Al	Ga	Y	3.064	0.689	Mg	Ca	Ca	Sr	Ge	Sn	Ti	Ti	3.758	0.940
Sr	Sr	Ge	Zr	Al	In	Sc	Sc	2.131	0.484	Sr	Sr	Ti	Hf	Al	Al	Ga	Sc	2.642	0.680	Sr	Sr	Ba	Zn	Si	Ti	Zr	Zr	3.064	0.799	Mg	Ca	Sr	Ba	Si	Ti	Ti	Zr	3.759	0.717
Zn	Cd	Ge	Hf	Al	Al	Y	Y	2.131	0.468	Mg	Mg	Si	Ge	Ga	In	Sc	2.642	0.506	Be	Zn	Hf	Hf	Al	Al	Ga	In	Sc	3.064	0.656	Be	Ca	Sr	Sn	Ti	Ti	Zr	Zr	3.759	0.837
Sr	Zn	Cd	Cd	Si	Ge	Ge	Hf	2.131	0.187	Be	Be	Be	Cd	Si	Ge	Sn	Zr	2.642	0.539	Mg	Ca	Si	Si	Al	Al	In	Sc	3.064	1.130	Mg	Mg	Sr	Ba	Ge	Si	Zr	Zr	3.759	0.817
Sr	Ba	Cd	Cd	Si	Ge	Ge	Ti	2.131	0.475	Sr	Cd	Si	Ti	Al	Al	Y	Y	2.642	0.761	Be	Be	Ca	Zn	Sn	Sn	Zr	Hf	3.064	1.095	Be	Mg	Ca	Cd	Si	Si	Si	Ti	3.759	0.647
Be	Cd	Sn	Hf	Ga	Ga	Ga	In	2.131	0.461	Mg	Sr	Ge	Zr	Ga	Y	Y	2.642	0.474	Mg	Zn	Hf	Hf	Al	Ga	Ga	In	Sc	3.064	0.972	Be	Ca	Sr	Ba	Si	Ge	Ti	Ti	3.760	0.833
Sr	Sr	Ge	Zr	Al	Al	Ga	Sc	2.131	0.174	Sr	Sr	Si	Ge	Sc	Y	Y	Y	2.642	0.712	Mg	Sr	Ti	Ti	Al	Ga	Sc	Sc	3.064	0.607	Mg	Ca	Sr	Sr	Ge	Zr	Hf	Hf	3.760	0.811
Mg	Ca	Ge	Sn	Al	Al	Y	Y	2.132	0.686	Cd	Cd	Ge	Hf	Al	Sc	Y	Y	2.642	0.921	Be	Be	Mg	Zn	Ge	Ge	Sn	Zr	3.065	0.714	Be	Zn	Ti	Hf	Al	Al	Al	Ga	3.760	0.825
Sr	Zn	Ge	Ge	Ga	Sc	Y	Y	2.132	0.684	Ca	Sr	Zr	Hf	Ga	Ga	Ga	In	2.642	0.536	Be	Zn	Ge	Hf	Ga	Ga	Ga	Zr	3.065	0.769	Be	Zn	Ti	Zr	Al	Al	Al	Y	3.760	0.936
Be	Zn	Sn	Al	In	Sc	Sc	Y	2.132	0.193	Ca	Cd	Ti	Ti	Al	Ga	Y	Y	2.642	0.759	Be	Be	Mg	Zn	Ge	Ge	Sn	Ti	3.065	0.711	Mg	Ca	Ca	Ba	Ti	Zr	Zr	Hf	3.760	0.787
Sr	Sr	Sn	Hf	In	Sc	Sc	Y	2.132	0.565	Ca	Zn	Zn	Cd	Si	Si	Ge	Hf	2.642	1.020	Be	Mg	Sn	Hf	Sc	Y	Y	Y	3.065	0.814	Be	Ca	Ba	Ba	Si	Ge	Ti	Ti	3.760	0.765
Be	Zn	Si	Sn	Ga	Ga	Y	Y	2.132	0.552	Sr	Sr	Ba	Cd	Si	Ge	Ge	Hf	2.643	0.331	Ca	Zn	Si	Si	Al	Al	Ga	Sc	3.065	0.787	Be	Mg	Ti	Hf	Al	Al	Sc	Sc	3.760	0.950
Ba	Cd	Ti	Ti	Ga	In	In	Sc	2.132	0.622	Be	Ba	Ti	Zr	Al	Y	Y	Y	2.643	0.387	Cd	Cd	Ti	Zr	Al	Sc	Sc	Y	3.065	0.687	Be	Ti	Zr	Al	Al	Ga	Y	Y	3.761	0.780
Ba	Zn	Si	Ti	Ga	Ga	Ga	Y	2.132	0.556	Sr	Ba	Sn	Hf	Sc	Y	Y	Y	2.643	0.480	Mg	Mg	Ca	Cd	Sn	Sn	Ti	Zr	3.065	0.898	Be	Mg	Ca	Sr	Ge	Hf	Hf	Hf	3.761	0.684
Ba	Zn	Zr	Hf	Al	In	In	In	2.132	0.544	Ca	Sr	Si	Sn	Sc	Sc	Y	Y	2.643	0.709	Mg	Mg	Sr	Cd	Sn	Zr	Zr	Hf	3.065	1.067	Be	Mg	Ca	Ca	Si	Sn	Sn	Ti	3.762	0.770
Be	Sr	Ti	Hf	In	In	In	Y	2.132	0.609	Be	Mg	Si	Hf	In	In	In	Y	2.643	0.637																				

Sr	Zn	Ge	Sn	Al	Y	Y	Y	2.142	0.916	Ca	Zn	Sn	Hf	In	Sc	Sc	Sc	2.648	1.065	Be	Sr	Cd	Cd	Si	Si	Ge	Hf	3.071	0.813	Mg	Mg	Ca	Sr	Si	Si	Ge	Hf	3.779	0.629	
Ca	Sr	Cd	Cd	Si	Si	Sn	Zr	2.142	1.027	Sr	Ba	Ba	Cd	Si	Ge	Ge	Zr	2.648	0.612	Mg	Zn	Zr	Hf	Ge	Al	Ga	In	3.071	0.854	Be	Mg	Sr	Sr	Ge	Ti	Ti	Hf	3.779	0.869	
Sr	Cd	Ge	Al	Al	Al	Y	Y	2.143	0.840	Be	Sr	Zn	Sn	Sn	Sn	Sn	Ti	2.648	0.910	Mg	Ba	Zr	Zr	Al	Al	Al	Sc	3.071	0.733	Mg	Mg	Sr	Sr	Si	Ge	Zr	Hf	3.779	0.669	
Mg	Zn	Sn	Hf	Ga	Ga	Y	Y	2.143	0.886	Ca	Zn	Cd	Cd	Ge	Sn	Ti	Ti	2.648	1.152	Be	Be	Sr	Zn	Ge	Zr	Zr	Hf	3.071	0.905	Mg	Mg	Ca	Zn	Si	Ti	Ti	Hf	3.779	0.800	
Sr	Zn	Si	Zr	Hf	Ga	Ga	In	2.143	1.023	Be	Be	Sr	Cd	Ge	Ge	Sn	Zr	2.648	0.406	Be	Mg	Zr	Zr	Al	In	In	Y	3.071	0.864	Be	Ca	Ba	Ba	Ge	Zr	Hf	Hf	3.779	0.972	
Mg	Ca	Si	Sn	Ga	Ga	Ga	Sc	2.143	0.834	Sr	Sr	Sr	Cd	Sn	Ti	Zr	Hf	2.648	0.493	Ca	Ba	Zn	Ga	Ge	Zr	Hf	3.071	0.723	Mg	Mg	Ti	Zr	Al	Al	Ga	Sc	3.780	0.753		
Sr	Cd	Si	Hf	Ga	Ga	Sc	Sc	2.143	0.816	Cd	Cd	Si	Zr	Al	In	Sc	Sc	2.649	0.581	Ca	Ba	Zn	Zn	Ge	Ti	Ti	Zr	3.071	0.967	Mg	Ca	Ba	Si	Si	Sn	Hf	Sc	3.780	0.504	
Ca	Ca	Zn	Cd	Ge	Sn	Sn	Ti	2.143	0.874	Ca	Zn	Sn	Zr	Al	Al	Al	Ga	2.649	0.866	Be	Cd	Si	Ge	Sc	Sc	Y	Y	3.071	1.127	Ca	Sr	Ba	Si	Si	Ge	Zr	Sc	3.780	0.458	
Be	Zn	Ge	Hf	In	In	Y	Y	2.143	0.818	Mg	Cd	Ge	Zr	Al	Al	Ga	Ga	2.649	0.780	Be	Ba	Zn	Cd	Si	Zr	Zr	Zr	3.071	0.770	Mg	Ca	Sr	Sr	Ge	Ge	Zr	Hf	3.780	0.530	
Sr	Ba	Cd	Cd	Si	Si	Ge	Hf	2.143	0.790	Be	Mg	Ge	Ge	In	Sc	Y	Y	2.649	0.723	Ca	Sr	Zr	Hf	Al	Sc	Sc	Sc	3.071	1.052	Mg	Ca	Sr	Sr	Ti	Zr	Zr	Hf	3.780	0.727	
Mg	Ba	Ba	Cd	Si	Si	Ge	Ge	Sn	2.143	0.864	Be	Mg	Ge	Ge	Al	Ga	Y	Y	2.649	0.990	Be	Ca	Ge	Zr	Sc	Sc	Sc	Y	3.071	1.151	Be	Sr	Ba	Si	Si	Sn	Hf	3.780	0.953	
Mg	Ba	Cd	Cd	Si	Sn	Hf	Hf	2.143	0.803	Ca	Sr	Zn	Zn	Si	Sn	Ti	Ti	2.649	0.846	Ca	Ca	Zn	Zn	Si	Ti	Zr	Hf	3.071	0.740	Be	Mg	Ca	Zn	Ge	Ti	Ti	Ti	3.780	0.862	
Mg	Ba	Si	Ti	Al	Al	In	In	2.143	0.827	Be	Be	Sr	Zn	Si	Sn	Sn	Ti	2.649	0.774	Be	Be	Si	Ti	Al	In	Y	Y	3.071	0.853	Mg	Mg	Mg	Sr	Si	Ge	Ti	Hf	3.780	0.888	
Ba	Zn	Si	Sn	In	Sc	Sc	Sc	2.143	0.839	Mg	Sr	Hf	Hf	In	Sc	Sc	Y	2.649	0.612	Ca	Ca	Zr	Hf	Al	In	Sc	Y	3.071	0.830	Be	Mg	Ca	Sr	Ge	Ge	Hf	Hf	3.780	1.046	
Cd	Cd	Sn	Ti	Al	Al	Ga	Ga	Sc	2.143	0.761	Mg	Mg	Ca	Cd	Si	Sn	Sn	Zr	2.649	0.685	Ca	Sr	Zr	Zr	Al	Y	Y	Y	3.071	0.855	Be	Mg	Mg	Ba	Si	Ti	Hf	Hf	3.781	0.938
Sr	Zn	Ti	Hf	In	In	In	Sc	2.143	1.152	Ca	Zn	Si	Hf	Ga	Ga	Sc	Sc	2.649	0.743	Mg	Ba	Ba	Zn	Ge	Zr	Hf	Hf	3.072	0.798	Mg	Mg	Ca	Zn	Si	Ge	Ge	Ti	3.781	0.608	
Be	Cd	Ge	Ge	Al	Al	Ga	In	2.144	1.147	Mg	Ba	Si	Zr	In	Y	Y	Y	2.649	0.634	Be	Mg	Ca	Cd	Ge	Zr	Zr	Zr	3.072	0.635	Mg	Ca	Ba	Ba	Si	Ge	Ge	Hf	3.781	0.564	
Sr	Cd	Sn	Zr	Al	Al	Al	Ga	2.144	1.038	Ca	Zn	Zr	Zr	Ga	In	Sc	Sc	2.649	0.745	Ca	Cd	Ti	Hf	Al	Al	Al	Sc	Sc	3.072	1.015	Be	Mg	Ti	Hf	Al	Sc	Sc	Sc	3.781	0.725
Ba	Cd	Si	Sn	Ga	Sc	Sc	Sc	2.144	1.020	Mg	Mg	Cd	Cd	Ge	Sn	Zr	Hf	2.649	0.834	Be	Be	Sn	Hf	Al	Ga	Ga	Y	3.072	0.944	Be	Be	Sn	Ti	Al	Al	Ga	Sc	3.781	0.668	
Ca	Zn	Cd	Cd	Si	Sn	Sn	Ti	2.144	1.146	Be	Mg	Ge	Hf	Al	Al	In	Y	2.649	0.982	Ca	Zn	Si	Ge	Sc	Sc	Y	Y	3.072	0.635	Be	Mg	Mg	Sr	Ti	Zr	Hf	Hf	3.781	0.639	
Mg	Ca	Sn	Zr	Ga	Ga	Y	Y	2.144	1.028	Mg	Sr	Ti	Zr	In	Y	Y	Y	2.649	0.909	Ca	Cd	Ge	Zr	Sc	Y	Y	Y	3.072	0.548	Be	Ca	Sr	Ba	Ti	Ti	Ti	Hf	3.782	0.939	
Ca	Sr	Ge	Zr	Al	Al	In	In	2.144	0.989	Zn	Cd	Cd	Cd	Ge	Sn	Zr	Hf	2.649	0.884	Mg	Ca	Ca	Cd	Ge	Ge	Ti	Hf	3.072	0.591	Be	Mg	Mg	Zn	Si	Ti	Zr	Zr	3.782	1.375	
Mg	Sr	Si	Si	Ga	Al	Ga	In	Y	2.144	1.141	Ca	Ba	Zn	Zn	Ge	Ge	Ti	Zr	2.649	0.627	Be	Ca	Ti	Hf	Ga	Ga	Sc	Sc	3.072	0.477	Mg	Mg	Ca	Ba	Si	Ge	Hf	Hf	3.782	1.251
Sr	Ba	Si	Ge	Al	Al	Al	Y	2.145	1.022	Be	Mg	Mg	Hf	Al	Al	Y	Y	2.649	0.728	Mg	Mg	Sr	Cd	Sn	Ti	Hf	Hf	3.072	0.659	Mg	Mg	Ca	Sr	Ge	Ti	Ti	Hf	3.782	1.115	
Sr	Cd	Zr	Hf	In	In	In	Sc	2.145	0.903	Ca	Ca	Ti	Ti	Al	Ga	In	Y	2.649	0.816	Ca	Zn	Hf	Hf	Al	Sc	Y	Y	3.072	0.702	Mg	Mg	Ca	Zn	Ge	Ti	Ti	Hf	3.783	0.923	
Sr	Cd	Si	Zr	Al	Ga	Ga	Ga	2.145	0.972	Ca	Zn	Zn	Cd	Sn	Ti	Ti	Hf	Hf	2.649	0.679	Be	Cd	Ti	Hf	Ga	Ga	Y	Y	3.072	0.487	Be	Ca	Ba	Ba	Ge	Ge	Sn	Zr	3.783	1.059
Be	Sr	Si	Sn	Al	Al	Y	Y	2.145	0.990	Be	Ba	Zr	Zr	Ga	Ga	In	Sc	2.649	0.786	Be	Cd	Cd	Cd	Ge	Sn	Ti	Zr	3.072	1.014	Mg	Mg	Ca	Ba	Ge	Zr	Hf	3.783	0.921		
Mg	Cd	Si	Zr	Al	In	In	In	2.145	0.874	Mg	Sr	Zr	Hf	Ga	Ga	Ga	In	2.649	0.894	Be	Sr	Ti	Hf	Al	Al	Al	Ga	3.072	0.981	Be	Ca	Ca	Sr	Ge	Ge	Sn	Ti	3.783	1.065	
Be	Ca	Ge	Hf	Ga	Ga	In	In	2.145	0.962	Mg	Sr	Si	Ge	Al	Al	Y	Y	2.649	0.661	Mg	Zn	Si	Sr	Si	Ge	In	Sc	3.072	0.827	Be	Zn	Ti	Ti	Al	Al	Ga	Sc	3.783	1.144	
Be	Sr	Ge	Sn	Sc	Y	Y	Y	2.145	0.975	Mg	Sr	Sn	Ti	Al	Al	Sc	Sc	2.650	0.900	Ca	Ca	Sr	Cd	Si	Si	Ge	Ti	3.072	0.547	Mg	Ca	Sr	Ba	Si	Ti	Ti	Ti	3.784	1.004	
Sr	Ba	Si	Hf	In	In	Y	Y	2.145	0.905	Be	Be	Sr	Cd	Si	Si	Sn	Ti	2.650	1.012	Mg	Ba	Ba	Zn	Sn	Ti	Zr	Zr	3.072	0.579	Mg	Mg	Ca	Ba	Si	Sn	Ti	Ti	3.784	0.982	
Be	Ba	Sn	Ti	Al	Al	Ga	Ga	2.145	0.815	Ca	Ba	Ge	Hf	Ga	Y	Y	Y	2.650	0.688	Mg	Ca	Zn	Zn	Si	Ge	Hf	Hf	3.072	0.611	Be	Mg	Sr	Ti	Al	Al	Ga	Y	3.784	1.625	
Be	Zn	Sn	Sn	In	Sc	Sc	Y	2.145	0.916	Be	Ca	Ti	Hf	Ga	Ga	In	In	2.650	0.950	Ca	Zn	Ti	Ti	Al	Ga	Ga	Sc	3.072	0.675	Mg	Cd	Si	Ti	Al	Al	Al	Sc	3.784	1.026	
Ca	Ca	Cd	Cd	Si	Ge	Sn	Ti	2.145	1.004	Ca	Sr	Si	Si	Al	In	Sc	Sc	2.650	1.107	Be	Mg	Ca	Cd	Si	Hf	Hf	Hf	3.072	0.672	Be	Mg	Mg	Sr	Si	Si	Sn	Ti	3.784	1.136	
Sr	Cd	Ge	Al	Al	Al	Ga	Ga	2.145	1.070	Zn	Cd	Ge	Ge	Al	Sc	Sc	Y	2.650	0.551	Ba	Cd	Ti	Hf	Al	Al	Sc	Y	3.073	0.590	Be	Mg	Zn	Zn	Si	Si	Ge	Zr	3.784	1.332	
Ca	Ba	Cd	Cd	Ge	Ge	Ti	Hf	2.145	1.219	Be	Zn	Zr	Hf	In	In	In	Y	2.650	0.647	Mg	Cd	Cd	Cd	Si	Ge	Ge	Hf	3.073	0.584	Be	Be	Mg	Sr	Si	Si	Zr	Hf	3.784	1.107	
Mg	Ca	Sr	Cd	Ge	Ge	Sn	Sn	2.146	0.975	Sr	Cd	Hf	Hf	In	Sc	Y	Y	2.650	0.727	Be	Mg	Cd	Cd	Si	Ge	Ge	Hf	3.073	0.721	Be	Mg	Zn	Cd	Si	Si	Zr	3.784	0.797		
Ba	Zn	Zn	Cd	Si	Ge	Zr	Zr	2.146	1.059	Ba	Zn	Ti	Ti	Al	In	Sc	Sc	2.650	0.868	Sr	Ba	Ba	Zn	Ge	Zr	Zr	Hf	3.073	0.894	Mg	Ca	Ca	Ba	Si	Si	Sn	Zr	3.785	0.767	
Be	Ba	Sn	Ti	Ga	Y	Y	Y	2.146	1.205	Ca	Ca	Sr	Cd	Sn	Sn	Ti	Zr	2.650	0.786	Sr	Ba	Ge	Ti	Sc	Sc	Y	Y	3.073	0.685	Mg	Ca	Sr	Ba	Si	Si	Zr	Zr	3.785	0.875	
Mg	Cd	Ge	Al	Al	In	In	In	2.146	0.993	Be	Cd	Ti	Ti	In	In	Y	Y	2.650	0.736	Sr	Zn	Ti	Hf	Al	Al	Al	Sc	3.073	0.808	Be	Mg	Ba	Ba	Ge	Ti	Hf	3.785	1.100		
Mg	Cd	Sr	Hf	In	In	Sc	Sc	2.146	1.007	Mg	Ba	Ba	Cd	Si	Zr	Hf	Hf	2.650	0.988	Mg	Sr	Zr	Hf	Al	Sc	Sc	Y	Y	3.073	0.887	Be	Ca	Sr	Sn	Ti	Zr	Zr	3.785	1.334	
Ca	Ba	Si	Si	Al	Ga	In	In	2.146	1.136	Mg	Sr	Zn	Zn	Cd	Sn	Sn	Hf	2.650	0.851	Ca	Sr	Zn	Zn	Sn	Zr	Hf	Hf	3.073	0.619	Be	Mg	Ti	Hf	Al	Al	Ga	Ga	3.785	1.253	
Mg	Ba	Ti	Hf	Ga	Ga	In	In	2.146	0.852	Mg	Mg	Ba	Cd	Cd	Ge	Sn	Ti	2.650	0.787	Be	Ba	Ba	Zn	Si	Ge	Ge	Ti	3.073	0.684	Be	Mg	Ca	Sr	Ti	Ti	Hf	Hf	3.785	1.243	
Be	Ba	Ti	Ti	Ga	In	In	Y	2.146	0.859	Be	Zn	Sn	Ti	In	Y	Y	Y	2.650	0.638	Be	Sr	Si	Zr	Sc	Sc	Y	Y	3.073	0.631	Be	Mg	Sr	Sr	Si	Ti	Hf	Hf	3.785	1.425	
Ca	Ca	Si	Zr	Ga	In	In	Y	2.147	0.838	Be	Ca	Ge	Zr	Ga	Ga	Ga	Sc	2.650	0.712	Ba	Zn	Ti	Zr	Sc	Sc	Y	Y	3.073	0.864	Mg	Mg	Ca	Ba	Si	Ge	Ti	3.785	1.326		
Ba																																								

Be	Ca	Sn	Hf	Ga	Ga	In	2.154	0.804	Mg	Zn	Sn	Hf	In	Y	Y	2.655	0.730	Be	Be	Ba	Zn	Si	Ti	Ti	Hf	3.079	0.519	Be	Mg	Ca	Ca	Si	Si	Ge	Sn	3.805	0.734			
Ca	Zn	Si	Ti	In	In	Y	2.154	0.723	Zn	Zn	Zr	Hf	Al	Ga	Y	2.655	0.699	Sr	Ba	Ti	Hf	Sc	Y	Y	Y	3.079	0.550	Mg	Ca	Ba	Ba	Si	Ge	Ge	Ti	3.805	0.768			
Ca	Sr	Ge	Zr	Al	Ga	Ga	2.154	0.707	Be	Mg	Ge	Ti	Ga	Ga	Y	2.655	0.634	Be	Mg	Ba	Cd	Ge	Ti	Ti	Ti	3.079	0.344	Mg	Ca	Ba	Ba	Si	Ge	Ti	Zr	3.805	0.761			
Ca	Ca	Ge	Sn	Al	Sc	Sc	2.154	0.793	Be	Ba	Cd	Cd	Ge	Ge	Ti	2.656	0.850	Be	Mg	Ca	Cd	Sn	Sn	Ti	Ti	3.079	0.408	Mg	Zn	Si	Ti	Al	Al	Sc	Sc	3.805	0.887			
Ca	Zn	Si	Hf	Al	Ga	Ga	2.155	0.708	Be	Mg	Ge	Zr	Ga	Ga	Y	2.656	0.762	Ba	Zn	Ti	Zr	Ga	Sc	Sc	Sc	3.079	0.593	Be	Mg	Si	Ti	Sc	Y	Y	Y	3.805	0.832			
Ca	Sr	Zn	Cd	Ge	Ge	Zr	2.155	0.757	Be	Mg	Ge	Zr	In	In	Sc	2.656	0.630	Ca	Sr	Si	Ti	Ga	Y	Y	Y	3.079	0.405	Be	Mg	Mg	Cd	Si	Si	Ge	Ti	3.805	0.843			
Be	Sr	Zn	Cd	Ge	Zr	Sc	2.155	0.771	Mg	Zn	Ge	Zr	Ga	Ga	Y	2.656	0.639	Be	Mg	Cd	Cd	Ge	Sn	Ti	Ti	3.079	0.628	Be	Mg	Si	Hf	Al	Al	Al	Y	3.805	0.924			
Sr	Ba	Ge	Ti	Al	Al	In	2.155	0.654	Mg	Ba	Ti	Ti	Al	Al	Ga	In	2.656	0.620	Be	Sr	Cd	Cd	Ge	Zr	Zr	Hf	3.079	0.764	Ca	Sr	Ba	Ba	Si	Ge	Ge	Ti	3.805	0.850		
Ca	Ba	Sn	Zr	Al	Al	Al	2.155	1.061	Cd	Cd	Si	Zr	Al	Al	Ga	Y	2.656	0.589	Be	Be	Ca	Cd	Ge	Ge	Zr	Hf	3.079	0.552	Mg	Mg	Sr	Ba	Si	Si	Zr	Hf	3.805	0.755		
Be	Ba	Si	Ge	In	Sc	Sc	2.155	1.081	Ca	Sr	Cd	Cd	Ge	Zr	Hf	2.656	0.715	Be	Be	Sr	Zn	Si	Si	Ge	Zr	3.079	0.437	Mg	Sr	Sr	Si	Ge	Ti	Zr	3.806	0.721				
Be	Sr	Si	Si	Al	Ga	In	2.156	0.964	Ba	Zn	Ti	Ti	Al	Al	Ga	Y	2.656	0.677	Sr	Ba	Ba	Zn	Sn	Zr	Hf	3.079	0.381	Be	Be	Mg	Mg	Si	Ge	Sn	Zr	3.806	0.730			
Ba	Ba	Zn	Cd	Si	Si	Ti	Hf	2.156	0.908	Mg	Ca	Ca	Cd	Si	Sn	Sn	Zr	2.656	0.619	Mg	Ca	Ca	Cd	Si	Si	Ti	3.079	0.290	Mg	Ca	Ba	Ba	Si	Si	Sn	Ti	3.807	0.737		
Be	Ta	Ti	Hf	In	In	Sn	2.156	1.073	Ba	Zn	Si	Hf	Ga	Y	Y	2.656	0.845	Be	Be	Ba	Zn	Si	Ti	Zr	Zr	3.079	0.186	Mg	Sr	Sr	Ba	Si	Ti	Ti	Zr	3.807	0.716			
Sr	Zn	Cd	Cd	Si	Si	Sn	Ti	2.156	0.947	Sr	Zn	Ti	Zr	Al	Al	Y	2.656	0.769	Ca	Ca	Sr	Zn	Si	Ge	Zr	Zr	3.079	0.731	Mg	Mg	Ca	Zn	Si	Ti	Ti	Zr	3.807	0.830		
Zn	Cd	Hf	Hf	Al	Ga	In	2.156	0.873	Ba	Zn	Ti	Ti	Al	Ga	Sc	Y	2.656	0.694	Be	Cd	Si	Zr	Al	Y	Y	Y	3.079	0.377	Be	Be	Mg	Sr	Si	Si	Ti	Hf	3.807	0.979		
Ca	Ba	Si	Hf	In	In	Y	2.156	1.067	Mg	Ba	Zn	Cd	Cd	Ge	Ge	Sn	Hf	2.656	0.665	Sr	Sr	Ba	Zn	Ge	Ti	Zr	3.080	0.281	Be	Mg	Zn	Zn	Si	Ti	Ti	Hf	3.808	0.852		
Ca	Sr	Sn	Hf	Al	Al	Al	2.156	0.940	Sr	Sr	Ba	Cd	Sn	Zr	Zr	Hf	2.656	0.605	Be	Be	Mg	Ba	Si	Si	Sn	Hf	3.080	0.464	Be	Ba	Ba	Ba	Si	Ge	Ti	Hf	3.808	0.834		
Ca	Sr	Ge	Sn	Al	Y	Y	2.157	0.808	Mg	Ba	Ba	Cd	Si	Si	Zr	Hf	2.657	0.617	Be	Be	Ge	Zr	Al	In	In	Sc	3.080	0.558	Mg	Mg	Ca	Ca	Si	Ge	Sn	Hf	3.808	0.766		
Ca	Cd	Ge	Sn	Al	Ga	Ga	2.157	0.888	Be	Sr	Ba	Zn	Sn	Sn	Zr	2.657	0.772	Mg	Ba	Si	Ti	Al	Al	Al	Ga	3.080	0.382	Be	Be	Ca	Sr	Si	Zr	Hf	3.808	0.782				
Sr	Cd	Si	Sn	Al	Al	Al	2.157	0.880	Be	Sr	Hf	Hf	Al	Al	Ga	In	2.657	0.658	Be	Be	Sr	Zn	Ti	Zr	Hf	Hf	3.080	0.829	Be	Mg	Sn	Ti	Al	Al	Al	Ga	3.808	0.767		
Ba	Cd	Ge	Hf	Al	Al	Sc	2.157	0.776	Zn	Zn	Si	Si	Ga	In	Sc	Y	2.657	0.633	Mg	Mg	Zr	Hf	Ga	Ga	In	Y	3.080	0.659	Mg	Ca	Sr	Ba	Ge	Ge	Ge	Zr	3.809	0.839		
Sr	Ba	Ge	Zr	Al	Al	Al	2.157	0.876	Ca	Ba	Ba	Cd	Sn	Zr	Zr	Hf	2.657	0.655	Mg	Ca	Ca	Cd	Si	Zr	Hf	Hf	3.080	0.474	Be	Sr	Ba	Ba	Si	Ti	Ti	Zr	3.809	0.809		
Be	Ca	Si	Hf	In	In	In	2.157	0.863	Be	Ca	Ti	Ti	In	In	Y	2.657	0.737	Be	Be	Sr	Cd	Si	Si	Ti	Hf	3.080	0.641	Be	Zn	Si	Zr	Al	Al	Al	Ga	3.809	0.795			
Sr	Zn	Si	Zr	Al	Al	In	2.157	0.820	Be	Ca	Ba	Cd	Ge	Zr	Zr	Hf	2.657	0.821	Be	Be	Ca	Ba	Si	Si	Ge	Sn	3.080	0.429	Be	Mg	Si	Si	Al	Al	Ga	Y	3.810	0.791		
Ca	Ca	Ge	Ti	Al	Ga	Ga	Y	2.157	0.836	Sr	Ba	Ba	Zn	Si	Sn	Hf	2.657	0.740	Be	Be	Mg	Sr	Si	Sn	Sn	Ti	3.080	0.407	Be	Mg	Ca	Sr	Si	Zr	Zr	Zr	3.810	0.926		
Be	Cd	Si	Ti	Ga	In	In	2.157	0.793	Be	Be	Sn	Hf	Si	Ga	Ga	In	Y	2.657	0.786	Be	Ca	Zn	Zn	Ge	Ge	Sn	Zr	3.080	0.623	Mg	Mg	Ca	Sr	Si	Ti	Hf	Hf	3.810	0.874	
Mg	Cd	Si	Sn	In	Y	Y	2.157	0.895	Ca	Ba	Ba	Zn	Si	Ge	Ge	Sn	2.657	0.853	Mg	Sr	Zn	Zn	Si	Si	Sn	Hf	3.081	0.718	Be	Ca	Sr	Sr	Ge	Ge	Zr	Hf	3.811	0.876		
Mg	Ba	Zr	Hf	In	In	In	Y	2.157	0.973	Mg	Zn	Si	Ti	In	In	Sc	2.657	0.541	Be	Mg	Mg	Cd	Sn	Sn	Ti	Zr	3.081	0.631	Mg	Mg	Sr	Sr	Si	Ge	Ti	Hf	3.811	0.968		
Ca	Zn	Sn	Zn	Al	Al	Y	2.157	1.068	Be	Cd	Cd	Cd	Ge	Ge	Ti	Zr	2.657	0.580	Be	Cd	Zr	Zr	Al	Al	Sc	Y	3.081	0.967	Mg	Mg	Ca	Zn	Ge	Ti	Ti	Zr	3.811	0.898		
Ca	Ca	Si	Sn	In	Sc	Y	2.157	0.864	Be	Cd	Ti	Zr	Ga	Ga	Y	2.657	0.598	Ca	Sr	Zn	Zn	Sn	Ti	Ti	Zr	3.081	0.809	Mg	Mg	Zn	Si	Zr	Al	Al	Al	Sc	3.812	0.785		
Ca	Ca	Ge	Hf	Al	Ga	Ga	Sc	2.157	0.961	Be	Ba	Ge	Ti	Ga	Sc	Sc	2.657	1.208	Be	Ca	Zr	Hf	Sc	Sc	Y	Y	3.081	0.706	Mg	Ca	Sr	Ba	Si	Si	Si	Ge	3.812	0.753		
Be	Zn	Sn	Zr	Ga	Ga	In	Y	2.157	1.092	Ca	Cd	Zr	Hf	Ga	Ga	Y	2.657	1.087	Sr	Ba	Ba	Zn	Ge	Ti	Zr	3.081	0.797	Mg	Ca	Sr	Si	Ge	Ti	Hf	3.812	0.784				
Ba	Ba	Zn	Zn	Ge	Sn	Zr	Hf	2.157	0.895	Be	Ba	Ba	Zn	Ge	Sn	Hf	2.657	0.857	Cd	Cd	Si	Sn	Al	Al	Al	Sc	3.081	0.595	Be	Ca	Ba	Ba	Ge	Ge	Ti	Zr	3.813	0.767		
Be	Mg	Si	Ge	In	In	In	Y	2.158	0.910	Ca	Sr	Hf	Hf	Al	Al	Ga	Y	2.658	1.364	Mg	Zn	Ti	Hf	Al	Al	Y	Y	3.081	0.633	Mg	Zn	Ti	Zr	Al	Sc	Sc	Sc	3.813	0.890	
Mg	Ba	Si	Sn	Al	Al	Y	2.158	1.011	Mg	Ba	Sr	Zr	Ga	Ga	Sc	Y	2.658	1.111	Ca	Ca	Sr	Zn	Si	Si	Sn	Hf	3.081	0.839	Mg	Sr	Sr	Ba	Si	Si	Ti	Hf	3.814	0.837		
Be	Ba	Ge	Ti	Ga	Ga	Y	2.158	0.780	Mg	Mg	Mg	Ge	Zr	Al	Al	Y	2.658	0.897	Mg	Cd	Sn	Ti	Sc	Sc	Y	Y	3.081	0.657	Be	Be	Ti	Zr	Al	Ga	Sc	Sc	3.814	0.844		
Ca	Zn	Si	Zr	Ga	Ga	In	2.158	0.789	Be	Zn	Ge	Ti	Al	Al	In	In	2.658	0.481	Mg	Ba	Ba	Zn	Si	Ti	Hf	Hf	3.081	0.845	Mg	Ca	Sr	Sr	Ge	Ge	Ti	Zr	3.814	0.923		
Sr	Cd	Ge	Sn	Al	Sc	Sc	2.158	0.756	Sr	Ba	Ge	Ti	In	Sc	Sc	Sc	2.658	0.431	Mg	Zn	Sn	Ti	Al	Al	Al	In	3.081	0.443	Be	Sr	Sr	Ba	Ge	Ti	Ti	Hf	3.814	0.852		
Cd	Cd	Ge	Sn	Al	Sc	Sc	Y	2.158	0.762	Be	Sr	Sr	Cd	Sn	Ti	Zr	Zr	2.658	0.691	Ca	Ca	Cd	Cd	Ti	Ti	Zr	Hf	3.081	0.237	Ca	Sr	Sr	Ba	Si	Ge	Ge	Ti	3.814	0.768	
Ca	Cd	Ge	Hf	Al	Al	Al	Ga	2.159	0.839	Be	Ba	Ba	Ba	Zn	Si	Sn	Sn	Hf	2.658	0.479	Be	Sr	Si	Si	Al	Sc	Y	Y	3.081	0.165	Be	Sr	Sr	Sr	Si	Ti	Zr	Hf	3.814	0.736
Cd	Cd	Si	Zr	Ga	In	In	Sc	2.159	0.750	Be	Mg	Sn	Zr	In	Y	Y	Y	2.658	0.368	Mg	Sr	Si	Si	Al	Al	Sc	3.081	0.238	Be	Be	Be	Mg	Ge	Sn	Ti	Zr	3.814	0.735		
Ca	Ba	Cd	Cd	Ge	Ge	Ti	Zr	2.159	0.929	Ca	Sr	Sn	Sr	Zr	Al	Y	Y	2.658	0.729	Be	Mg	Cd	Cd	Si	Ge	Hf	Hf	3.081	0.059	Be	Ca	Ba	Ba	Si	Ti	Ti	Zr	3.815	0.746	
Mg	Sr	Ba	Cd	Zn	Si	Sn	Sn	2.159	0.965	Sr	Cd	Sn	Ti	Sc	Sc	Y	Y	2.658	1.455	Be	Ca	Cd	Cd	Si	Ti	Hf	Hf	3.082	-0.001	Mg	Ca	Sr	Sr	Ge	Ge	Ti	Hf	3.815	0.727	
Cd	Cd	Zr	Hf	Al	In	In	Y	2.159	0.877	Be	Zn	Si	Sn	Ga	Ga	Sc	2.658	1.311	Ca	Zn	Zr	Zr	In	Sc	Sc	Y	3.082	0.607	Be	Ca	Sr	Ba	Ge	Ge	Ge	Ti	3.815	0.828		
Cd	Cd	Si	Si	Al	Ga	In	Y	2.159	0.752	Ca	Ba	Zn	Cd	Ge	Hf	Hf	Hf	2.658	1.315	Zn	Cd	Ti	Hf	In	Sc	Sc	Sc	3.082	0.168	Be	Mg	Si	Ti	In	Sc	Sc	Sc	3.815	1.017	
Ca	Zn	Si	Sn	In	Y	Y	2.159	0.953	Sr	Sr	Ba	Cd	Ge	Zr	Zr	Hf	2.659	0.623	Mg	Mg	Sr	Cd	Si	Si	Ge	Hf	3.082	0.115	Be	Mg	Mg	Ca	Ge	Sn	Sn	Ti	3.815	0.902		
Mg	Ba	Ge	Zr	Al	Ga	Ga																																		

Cd	Cd	Sn	Hf	Al	Al	Sc	Y	2.168	0.597	Ba	Zn	Si	Si	Si	Ga	Sc	Y	Y	2.664	0.606	Be	Cd	Ge	Ti	Al	Al	Al	In	3.087	0.875	Mg	Ca	Ca	Sr	Ti	Zr	Zr	Hf	3.837	1.634	
Ca	Ca	Si	Sn	Zr	Al	In	In	Y	2.169	1.185	Ca	Ba	Ti	Zr	Zr	Ga	Ga	Y	Y	2.664	0.714	Mg	Ca	Sr	Cd	Ge	Ti	Ti	Ti	3.087	0.667	Be	Mg	Mg	Sr	Ge	Sn	Ti	Ti	3.837	1.178
Sr	Sr	Si	Sn	Zr	Ga	Sc	Y	Y	2.169	1.205	Ca	Ba	Ti	Zr	Zr	Ga	Ga	Y	Y	2.664	0.694	Sr	Sr	Ba	Zn	Ti	Ti	Zr	Hf	3.087	0.538	Be	Mg	Mg	Sr	Si	Ge	Ge	Hf	3.837	1.188
Sr	Ba	Zn	Zn	Si	Sn	Sn	Zr	2.169	0.989	Be	Ba	Ti	Zr	Zr	Al	Al	Ga	Ga	2.664	0.624	Zn	Zn	Si	Zr	Al	Ga	Ga	Sc	3.087	0.513	Be	Ca	Ca	Ba	Ge	Ti	Hf	3.838	1.401		
Ba	Ba	Ti	Hf	Ga	In	In	Y	2.169	1.021	Ba	Cd	Hf	Hf	Ga	Sc	Y	Y	2.664	0.791	Ca	Sr	Si	Zr	Al	Ga	Sc	Sc	3.087	0.410	Be	Sr	Sr	Ba	Si	Si	Sn	Hf	3.839	1.241		
Be	Sr	Si	Hf	Ga	Ga	In	In	2.169	1.174	Zn	Zn	Cd	Cd	Ge	Sn	Zr	Hf	2.664	0.932	Be	Cd	Si	Ti	Ga	Ga	Ga	Y	3.087	0.292	Mg	Ca	Ba	Ba	Si	Si	Ge	Hf	3.839	1.266		
Ca	Ca	Cd	Cd	Si	Ge	Zr	Hf	2.170	0.947	Ca	Sr	Ge	Zr	Zr	Al	Al	Sc	Sc	2.664	0.822	Mg	Ba	Ti	Zr	Zr	Sc	Sc	Y	3.087	0.864	Be	Mg	Mg	Ba	Si	Si	Ge	Hf	3.839	1.599	
Be	Ca	Ge	Ge	In	Sc	Y	Y	2.170	0.989	Ba	Cd	Ti	Zr	Zr	Al	Al	In	2.664	0.819	Zn	Zn	Ti	Zr	Zr	Sc	Sc	Y	Y	3.087	0.504	Mg	Ca	Sr	Sr	Si	Zr	Hf	3.840	1.029		
Ca	Zn	Si	Si	Al	Ga	In	In	2.170	1.167	Be	Ba	Ba	Cd	Si	Zr	Hf	2.664	0.666	Sr	Ba	Ba	Zn	Si	Si	Si	Ti	Zr	3.087	0.392	Mg	Mg	Ca	Sr	Ge	Ti	Ti	Hf	3.840	0.909		
Sr	Cd	Cd	Ge	Sn	Ti	Hf	2.170	0.939	Be	Be	Sn	Zr	In	In	Sc	Y	2.664	0.607	Mg	Ca	Ba	Cd	Zr	Zr	Zr	Hf	3.087	0.587	Ca	Sr	Ba	Ba	Si	Si	Ge	Ti	3.840	0.853			
Sr	Cd	Sn	Zr	Al	Al	Al	Sc	2.170	0.834	Sr	Sr	Zr	Zr	Al	Ga	Sc	Sc	2.664	0.755	Ca	Ba	Zn	Zn	Si	Ti	Ti	Hf	3.087	0.666	Mg	Ca	Ca	Sr	Si	Sn	Zr	3.841	0.688			
Sr	Cd	Hf	Hf	Al	In	In	Sc	2.171	0.937	Be	Cd	Si	Si	Al	In	In	Sc	2.665	0.747	Ca	Ba	Ba	Zn	Ge	Ti	Zr	Zr	3.087	0.485	Be	Sr	Sr	Ba	Ge	Ti	Hf	3.841	0.771			
Mg	Sr	Cd	Cd	Ge	Sn	Hf	Hf	2.171	0.887	Be	Cd	Ge	Ge	Al	Ga	Sc	Sc	2.665	0.627	Be	Be	Mg	Cd	Sn	Ti	Zr	Zr	3.087	0.953	Be	Zn	Zr	Hf	Al	Al	Al	Sc	3.841	0.717		
Mg	Sr	Ge	Hf	Ga	Ga	Ga	Sc	2.171	0.803	Mg	Ba	Sn	Zr	Sc	Y	Y	Y	2.665	0.821	Sr	Zn	Ti	Zr	In	Sc	Sc	Sc	3.087	0.773	Be	Mg	Zn	Zn	Si	Ge	Ti	Ti	3.841	0.761		
Ca	Ca	Cd	Cd	Ge	Sn	Ti	Zr	2.171	0.927	Mg	Ba	Ti	Ti	Ga	Ga	Ga	Y	2.665	0.715	Ba	Cd	Si	Ti	Sc	Sc	Y	Y	3.087	0.581	Be	Mg	Si	Zr	Al	Al	Sc	Sc	3.841	0.805		
Ca	Cd	Ge	Sn	Ga	Sc	Sc	Sc	2.171	0.872	Be	Zn	Ge	Ti	Al	Ga	Ga	Y	2.665	0.830	Sr	Zn	Si	Hf	Al	Sc	Sc	Sc	3.087	0.723	Be	Ca	Sr	Sr	Si	Ge	Hf	Hf	3.841	0.749		
Sr	Sr	Si	Zr	Al	Ga	Ga	Y	2.171	0.900	Zn	Cd	Ti	Ti	Al	Al	Ga	In	2.665	0.979	Mg	Ca	Ca	Zn	Si	Sn	Sn	Zr	3.087	0.515	Be	Be	Mg	Ca	Si	Si	Ge	Hf	3.841	0.734		
Ba	Ba	Zn	Zn	Si	Ge	Sn	Zr	2.171	0.919	Be	Ca	Ge	Ge	Al	Sc	Y	2.665	0.772	Mg	Zn	Hf	Hf	Ga	Ga	Sc	Y	3.087	0.528	Be	Be	Mg	Ca	Ge	Ti	Zr	3.841	0.929				
Ba	Cd	Cd	Cd	Si	Ge	Ti	Zr	2.171	0.790	Be	Ba	Zn	Cd	Si	Ge	Ge	Ge	2.665	0.844	Be	Be	Zn	Cd	Si	Zr	Sc	Y	3.087	0.740	Be	Ca	Sr	Sr	Si	Ge	Zr	3.843	0.817			
Sr	Cd	Cd	Cd	Si	Sn	Ti	Zr	2.172	0.860	Ca	Ba	Hf	Hf	Al	Ga	Sc	Sc	2.665	1.063	Sr	Cd	Ti	Hf	Sc	Sc	Sc	Y	3.088	0.821	Be	Ca	Ca	Ba	Ge	Ti	Zr	3.843	0.820			
Sr	Zn	Hf	Hf	Ga	In	In	Y	2.172	0.957	Ca	Ba	Ge	Hf	Ga	Sc	Sc	Sc	2.665	0.632	Mg	Ba	Si	Hf	Al	Sc	Sc	Sc	3.088	0.743	Be	Mg	Mg	Zn	Ge	Ti	Ti	Hf	3.843	0.978		
Be	Sr	Sn	Zr	Ga	In	Y	Y	2.172	1.160	Zn	Zn	Sn	Zr	Al	Sc	Y	Y	2.665	0.662	Mg	Mg	Zn	Cd	Sn	Ti	Zr	Zr	3.088	1.085	Mg	Ca	Zn	Si	Si	Ge	Ti	3.843	0.846			
Be	Ba	Ba	Cd	Ge	Sn	Hf	Hf	2.172	0.830	Mg	Sr	Sn	Ti	Ga	Sc	Sc	Sc	2.665	0.768	Zn	Cd	Si	Zr	In	Al	Al	In	3.088	0.918	Mg	Ca	Ba	Ba	Si	Si	Ge	Zr	3.844	0.648		
Ba	Ba	Zn	Cd	Si	Si	Ti	Zr	2.172	0.947	Mg	Sr	Si	Si	Al	Al	Ga	Y	2.665	0.825	Be	Ca	Si	Zr	In	Sc	Sc	3.088	0.824	Mg	Mg	Ca	Ba	Ge	Ge	Ti	Zr	3.844	0.628			
Zn	Cd	Si	Si	Ga	In	In	Sc	2.172	1.146	Ba	Cd	Si	Ge	Al	Sc	Sc	Sc	2.665	0.783	Be	Be	Mg	Sr	Ge	Ge	Sn	Hf	3.088	0.872	Be	Be	Ca	Ca	Si	Ti	Zr	Hf	3.844	0.671		
Sr	Sr	Ge	Ti	Al	Al	Ga	In	2.172	0.918	Mg	Cd	Sn	Ti	In	Y	Y	Y	2.665	0.725	Be	Mg	Sr	Cd	Zr	Zr	Hf	Hf	3.088	0.674	Be	Be	Ca	Ca	Ge	Ti	Zr	3.845	0.738			
Be	Ca	Zn	Cd	Ge	Ge	Sn	Sn	2.172	0.935	Mg	Ba	Ge	Zr	Al	Al	Sc	Sc	2.666	0.945	Mg	Mg	Sr	Cd	Si	Ti	Hf	Hf	3.089	0.765	Be	Ca	Ca	Ba	Ti	Zr	Hf	3.846	0.917			
Mg	Ba	Cd	Cd	Si	Sn	Zr	Zr	2.173	1.064	Ca	Zn	Zn	Cd	Ge	Ge	Ti	Hf	2.666	0.813	Be	Sr	Si	Zr	Sc	Sc	Sc	Y	3.089	0.916	Mg	Mg	Ca	Ba	Sr	Si	Ge	Hf	3.847	0.842		
Ba	Cd	Hf	Hf	Ga	In	In	Sc	2.173	0.735	Sr	Sr	Ba	Cd	Si	Zr	Zr	Hf	2.666	0.760	Be	Be	Ca	Zn	Ge	Sn	Hf	Hf	3.089	0.737	Mg	Mg	Ca	Ba	Si	Si	Ge	Ti	3.848	0.817		
Mg	Ba	Si	Sn	Al	Y	Y	Y	2.173	0.766	Ba	Cd	Zr	Zr	Al	Al	In	2.666	0.678	Sr	Cd	Si	Zr	Zr	Al	Sc	Sc	Sc	3.089	0.967	Mg	Ca	Ba	Ba	Si	Si	Ti	Zr	3.848	0.957		
Ca	Sr	Ge	Sn	Sc	Sc	Sc	Y	2.173	0.688	Mg	Ba	Zr	Zr	Al	In	Sc	Sc	2.666	0.638	Be	Ca	Zn	Cd	Ge	Hf	Hf	Hf	3.089	0.534	Be	Mg	Ca	Sr	Sn	Ti	Ti	Ti	3.849	0.864		
Ca	Ca	Si	Sn	Al	Ga	Sc	Sc	2.173	0.789	Ca	Sr	Zn	Cd	Si	Si	Si	Hf	2.666	0.739	Mg	Ba	Ti	Zr	Sc	Y	Y	Y	3.089	0.333	Be	Mg	Zr	Zr	Al	Al	Ga	Sc	3.849	0.663		
Mg	Sr	Sn	Zr	Zr	Al	Al	Ga	Ga	2.173	0.771	Ca	Ca	Zn	Cd	Sn	Ti	Ti	Hf	2.666	0.725	Sr	Cd	Zr	Hf	Sc	Sc	Sc	Y	3.089	0.247	Be	Mg	Ti	Zr	Zr	Al	Ga	Ga	3.850	0.641	
Be	Ca	Sr	Zn	Si	Ge	Sn	Sn	2.173	0.645	Be	Ba	Ge	Zr	Sc	Sc	Sc	Y	2.666	0.658	Be	Zn	Si	Ti	Ga	Ga	Ga	In	3.089	0.348	Be	Mg	Ti	Zr	Al	Sc	Sc	Sc	3.850	0.693		
Be	Mg	Si	Ge	Sn	In	In	In	2.173	0.821	Be	Zn	Zr	Zr	Al	In	Y	Y	2.667	0.817	Be	Be	Ti	Zr	Zr	Al	Ga	Y	3.089	0.159	Mg	Ca	Ca	Sr	Si	Ti	Hf	Hf	3.850	0.679		
Zn	Zn	Si	Ge	Al	In	Y	Y	2.173	0.857	Ba	Cd	Si	Hf	Ga	Y	Y	Y	2.667	0.930	Mg	Sr	Zr	Hf	Al	Sc	Sc	Sc	3.090	0.084	Mg	Ca	Ba	Ba	Si	Si	Ti	Hf	3.851	0.672		
Mg	Ca	Ge	Ge	In	In	Sc	Sc	2.173	0.725	Be	Ca	Cd	Cd	Si	Si	Ge	Sn	2.667	0.823	Be	Be	Sr	Zn	Ti	Zr	Zr	Hf	3.090	0.718	Be	Ca	Ba	Ba	Si	Si	Ge	Ti	3.851	0.850		
Mg	Ca	Ba	Cd	Si	Si	Sn	Sn	2.173	0.657	Mg	Ca	Si	Si	Al	Ga	Ga	In	2.667	0.820	Mg	Ba	Ba	Zn	Si	Si	Sn	Ti	3.090	0.274	Be	Mg	Sr	Ba	Ge	Ge	Ti	Ti	3.851	0.994		
Zn	Cd	Sn	Zr	Al	Al	Ga	Ga	2.173	0.822	Ca	Ca	Si	Ti	Al	In	Y	Y	2.667	0.692	Be	Be	Mg	Sr	Ge	Sn	Sn	Ti	3.090	0.205	Be	Mg	Mg	Zn	Ti	Ti	Zr	Hf	3.851	0.875		
Ca	Ba	Cd	Cd	Si	Ge	Ge	Zr	2.174	0.690	Sr	Cd	Zr	Hf	Ga	Ga	Sc	Sc	2.667	0.630	Mg	Mg	Ba	Cd	Ge	Ge	Ti	Hf	3.090	0.392	Mg	Mg	Ca	Sr	Ge	Sn	Ti	Ti	3.852	0.858		
Mg	Ca	Sn	Ti	Ga	Ga	Ga	Y	2.174	0.627	Ca	Sr	Cd	Cd	Sn	Hf	Hf	Hf	2.667	0.765	Be	Be	Sn	Hf	Al	Ga	Ga	In	3.090	0.381	Mg	Mg	Mg	Ca	Ge	Sn	Zr	Hf	3.852	0.741		
Cd	Cd	Sn	Ti	Al	Al	Ga	Y	2.174	0.814	Sr	Zn	Sn	Hf	Sc	Y	Y	Y	2.667	0.773	Ca	Sr	Ti	Zr	Al	Al	Sc	Sc	3.090	0.268	Be	Ca	Ca	Ba	Ti	Ti	Zr	Hf	3.853	0.785		
Ba	Ba	Si	Ti	In	In	Sc	Y	2.174	0.684	Zn	Zn	Sn	Ti	Al	Ga	Ga	Sc	2.667	0.652	Be	Be	Sr	Ge	Sn	Ti	Hf	3.090	0.777	Be	Be	Ca	Ca	Ge	Ti	Zr	Hf	3.853	0.772			
Mg	Ba	Cd	Cd	Sn	Sn	Ti	Hf	2.174	1.039	Ca	Ba	Ti	Ti	Al	Ga	Sc	Sc	2.667	0.832	Mg	Ca	Zr	Hf	In	Sc	Sc	Sc	3.090	0.509	Mg	Mg	Ca	Sr	Ge	Ge	Zr	Hf	3.853	0.787		
Cd	Cd	Ti	Zr	Al	In	In	Y	2.174	1.080	Be	Sr	Hf	Hf	Al	Al	In	Y	2.667	0.740	Zn	Cd	Zr	Hf	Al	Ga	Sc	Sc	3.090	0.384	Be	Mg	Ca	Ca	Ge	Ge	Sn	Hf	3.853	0.798		
Ca	Ca	Si</																																							

Mg	Sr	Sn	Zr	Ga	Sc	Sc	2.184	0.847	Be	Zn	Ge	Hf	In	In	Sc	Sc	2.673	0.939	Be	Mg	Sn	Ti	Al	Y	Y	Y	3.097	0.409	Be	Mg	Mg	Sr	Si	Ti	Zr	Zr	3.883	1.422		
Sr	Ba	Ti	Hf	In	In	In	Sc	2.184	1.008	Be	Ca	Ti	Hf	In	In	Sc	Sc	2.673	0.715	Mg	Sr	Zn	Zn	Ge	Ge	Ti	Zr	3.097	0.331	Be	Mg	Mg	Sr	Si	Si	Ti	Hf	3.884	1.302	
Ba	Sr	Sn	Zr	Al	Al	Ga	In	Sc	2.185	0.856	Sr	Zn	Ti	Zr	Al	Ga	Ga	2.673	0.726	Be	Ca	Ba	Zn	Sn	Hf	Hf	3.097	0.535	Be	Mg	Ca	Sr	Si	Si	Ge	Ti	3.884	1.175		
Be	Zn	Ge	Sn	Ga	Ga	Ga	Y	2.185	0.659	Ca	Sr	Ti	Ti	Ga	Ga	In	Sc	2.674	0.876	Mg	Cd	Zr	Cd	In	Sc	Sc	Y	3.097	0.512	Mg	Sr	Ba	Ba	Si	Si	Ge	Ti	3.884	1.005	
Sr	Zn	Hf	Hf	Al	In	In	Y	2.185	0.817	Sr	Cd	Si	Si	In	Ga	Sc	Y	2.674	0.763	Mg	Cd	Zr	Cd	Zr	Hf	Hf	3.097	0.406	Be	Mg	Si	Zr	Al	Al	Al	Y	3.886	1.127		
Ba	Cd	Ti	Zr	Al	Al	In	In	2.185	0.880	Zn	Cd	Si	Ge	Al	Y	Y	Y	2.674	0.742	Be	Ca	Ti	Ti	Al	Al	Ga	In	3.097	0.912	Mg	Ca	Ba	Si	Ge	Ti	Ti	3.886	0.996		
Sr	Cd	Si	Ti	In	In	Sc	Sc	2.185	0.619	Ba	Cd	Ti	Ti	Al	Ga	Sc	Sc	2.674	0.948	Be	Ca	Sr	Zn	Si	Si	Si	Sn	3.097	0.632	Be	Ca	Ca	Sr	Sn	Ti	Zr	3.886	1.145		
Mg	Cd	Ge	Hf	Ga	Ga	Ga	In	2.185	0.806	Mg	Ba	Hf	Hf	Ga	Ga	Sc	Y	2.674	0.764	Mg	Ca	Sr	Cd	Si	Ti	Ti	Ti	3.097	0.514	Be	Mg	Mg	Ca	Ge	Sn	Hf	3.886	1.217		
Ba	Sr	Sn	Zr	Al	Al	Ga	Sc	Sc	2.185	0.865	Cd	Cd	Si	Ti	Ga	In	Sc	Sc	2.674	0.927	Be	Mg	Ge	Ti	Ga	Y	Y	Y	3.098	0.718	Mg	Mg	Mg	Ca	Si	Sn	Zr	Hf	3.887	1.084
Be	Sr	Sn	Zr	Al	Al	Ga	Ga	2.185	0.620	Ba	Cd	Si	Ge	Sc	Sc	Y	Y	2.674	1.081	Mg	Ca	Ca	Zn	Ge	Sn	Hf	3.098	0.506	Be	Mg	Ca	Ba	Si	Ti	Ti	3.887	1.060			
Cd	Cd	Sn	Zr	Al	Al	Ga	Sc	2.185	0.648	Sr	Zn	Si	Ge	Ga	Sc	Sc	Sc	2.674	0.788	Mg	Mg	Ba	Cd	Sn	Ti	Ti	Hf	3.098	0.568	Mg	Mg	Ca	Ba	Si	Si	Zr	Hf	3.887	1.292	
Be	Cd	Sn	Zr	Ga	Ga	Ga	In	2.185	0.743	Sr	Ba	Si	Si	In	Sc	Sc	Y	2.674	0.947	Be	Mg	Ca	Sr	Si	Si	Sn	Zr	3.098	0.609	Be	Ca	Ca	Sr	Ge	Ti	Zr	Zr	3.887	1.097	
Sr	Cd	Sn	Ti	Al	Al	Al	Y	2.185	0.696	Mg	Sr	Zr	Zr	In	Sc	Y	Y	2.674	1.171	Be	Mg	Sr	Cd	Zr	Zr	Zr	Hf	3.098	0.591	Mg	Ca	Ca	Ba	Si	Zr	Hf	3.888	1.211		
Sr	Zn	Sn	Ti	Al	Al	Ga	Ga	2.186	0.854	Sr	Ba	Si	Ti	Al	Al	Y	Y	2.674	0.665	Be	Be	Ti	Zr	Ga	In	Y	3.098	0.553	Be	Mg	Mg	Ba	Si	Ge	Ge	Ti	3.888	1.397		
Sr	Cd	Si	Ti	Ga	Ga	Y	Y	2.186	1.096	Zn	Zn	Ti	Zr	In	In	Sc	Y	2.674	0.723	Be	Sr	Ba	Si	Ge	Ge	Hf	3.098	0.964	Be	Mg	Mg	Sr	Ge	Ge	Zr	Hf	3.888	1.183		
Mg	Sr	Sn	Hf	Al	Al	Al	Y	2.186	0.655	Mg	Sr	Hf	Hf	Al	Al	In	Y	2.675	0.839	Mg	Cd	Sn	Zr	Al	Ge	Sc	Sc	3.098	0.700	Be	Ca	Ca	Ba	Ge	Ge	Zr	Hf	3.888	0.882	
Ba	Zn	Si	Si	Ge	Ga	Sc	Y	2.186	0.843	Mg	Sr	Ge	Hf	Al	Al	Al	Y	2.675	0.941	Sr	Zn	Si	Si	Al	Sc	Sc	Y	3.098	0.644	Be	Mg	Sr	Sr	Ge	Ge	Ti	Hf	3.888	0.856	
Ba	Ba	Si	Si	Ge	In	Sc	Y	2.186	1.082	Sr	Zn	Ge	Ge	Ga	Sc	Sc	Sc	2.675	0.880	Ca	Cd	Zr	Hf	Al	Al	Sc	Sc	3.098	0.786	Be	Mg	Sr	Zn	Si	Si	Si	Ti	3.889	0.966	
Be	Ba	Zr	Zr	In	In	Sc	Y	2.186	0.643	Be	Sr	Sr	Cd	Ge	Zr	Zr	Hf	2.675	0.829	Be	Mg	Ge	Ge	Al	Ga	Ga	Sc	3.098	0.583	Be	Sr	Sr	Ba	Si	Ti	Ti	Hf	3.889	1.175	
Be	Sr	Ge	Sn	Sc	Sc	Y	Y	2.186	0.671	Be	Cd	Si	Sn	Sc	Y	Y	Y	2.675	1.053	Sr	Sr	Si	Ti	Ga	Sc	Y	Y	3.098	0.683	Be	Mg	Mg	Sr	Ge	Ti	Ti	Hf	3.891	1.392	
Ca	Zn	Cd	Cd	Ge	Sn	Sn	Ti	2.186	0.949	Ca	Zn	Zn	Cd	Si	Si	Ge	Zr	2.675	0.910	Be	Cd	Sn	Ti	Ga	Ga	Sc	Y	3.098	0.804	Be	Ca	Ca	Sr	Sn	Ti	Ti	Hf	3.892	1.314	
Sr	Ba	Sn	Hf	Al	Al	Y	Y	2.186	0.700	Sr	Zn	Ge	Hf	Sc	Sc	Y	Y	2.675	0.872	Mg	Cd	Ti	Ti	Al	Ga	Ga	Y	3.098	0.621	Be	Mg	Sr	Sr	Ge	Ge	Ti	Zr	3.892	1.317	
Mg	Ba	Ti	Ti	Ge	In	In	Y	2.186	0.722	Ca	Zn	Ti	Hf	Ga	Ga	Ga	In	2.675	0.734	Ca	Ba	Ba	Zn	Sn	Zr	Hf	Hf	3.098	0.819	Be	Be	Mg	Ca	Si	Ti	Ti	Hf	3.893	1.488	
Be	Zn	Ge	Ti	Ge	Al	In	Y	2.186	0.743	Mg	Cd	Ti	Hf	Ga	Ga	Y	Y	2.675	0.740	Zn	Cd	Si	Ge	Sc	Sc	Y	3.098	0.714	Mg	Mg	Ca	Zn	Si	Ge	Ti	Ti	3.893	1.393		
Be	Ca	Si	Si	Ga	In	In	Y	2.186	0.757	Be	Mg	Ge	Ge	Ga	Ga	Sc	Y	2.675	0.851	Ca	Zn	Ge	Ti	Al	Y	Y	Y	3.098	0.523	Be	Ca	Ba	Ba	Si	Si	Ge	Zr	3.896	1.003	
Ba	Ba	Si	Zr	Ga	Ga	Ga	Y	2.186	0.751	Ca	Zn	Ge	Zr	In	Y	Y	Y	2.675	0.749	Mg	Mg	Zn	Cd	Ge	Ge	Ti	Zr	3.098	0.466	Be	Mg	Mg	Ba	Ge	Ge	Ti	Hf	3.896	0.977	
Be	Mg	Ge	Sn	In	In	Sc	Sc	2.187	0.641	Ca	Ba	Zr	Zr	In	Sc	Sc	Y	2.675	0.756	Ba	Cd	Si	Ti	Sc	Sc	Sc	Y	3.098	0.656	Mg	Sr	Ba	Ba	Si	Si	Ge	Hf	3.897	1.187	
Sr	Sr	Ti	Hf	Ga	Ga	In	Y	2.187	0.825	Be	Ca	Ba	Cd	Sn	Hf	Hf	Hf	2.675	0.934	Mg	Ca	Cd	Cd	Si	Ti	Ti	Hf	3.098	0.407	Be	Ca	Ba	Ba	Si	Si	Zr	Hf	3.897	1.070	
Ca	Cd	Zr	Hf	Al	In	In	In	2.187	0.839	Zn	Cd	Ti	Ti	Al	Ga	Y	Y	2.676	1.030	Mg	Ba	Ba	Ba	Zn	Si	Ge	Ti	Ti	3.098	0.361	Mg	Sr	Ba	Ba	Si	Si	Ge	Zr	3.897	1.059
Be	Ba	Ba	Cd	Ge	Sn	Zr	Zr	2.187	0.724	Be	Cd	Ge	Sn	Sc	Sc	Y	Y	2.676	0.933	Mg	Ba	Ba	Ba	Zn	Zn	Zr	Hf	3.098	1.002	Mg	Zn	Si	Ti	Al	Al	Al	Ga	3.898	1.394	
Ca	Ca	Sn	Zr	Al	Al	Ga	Sc	2.187	0.654	Mg	Sr	Sn	Zr	Al	Al	Sc	Sc	2.676	0.938	Be	Ca	Ba	Zn	Si	Si	Ge	Ge	3.099	0.514	Be	Be	Mg	Zn	Si	Ge	Ti	Ti	3.898	1.795	
Mg	Ba	Sn	Zr	In	Y	Y	Y	2.187	0.794	Be	Ba	Ba	Cd	Si	Ge	Ge	Zr	2.676	0.739	Zn	Zn	Ge	Ti	Al	Al	Ga	Sc	3.099	0.474	Be	Ca	Sr	Ge	Ge	Ti	Zr	3.899	1.677		
Mg	Sr	Zn	Cd	Cd	Sn	Sn	Zr	2.187	0.680	Be	Ca	Ti	Ti	Hf	Ga	Ga	Sc	2.676	0.747	Be	Ca	Ti	Hf	Hf	Sc	Y	Y	3.099	0.663	Be	Zn	Si	Hf	Al	Al	Sc	3.899	1.559		
Cd	Cd	Si	Zr	Ga	Ge	Y	Y	2.187	0.622	Be	Mg	Sr	Zn	Si	Si	Sn	Sn	2.676	0.883	Zn	Cd	Ti	Ti	Ga	Sc	Sc	Y	3.099	0.584	Be	Ca	Ba	Ba	Si	Si	Ge	Hf	3.900	1.415	
Sr	Ba	Zn	Zn	Zr	Ga	In	Hf	Hf	2.187	0.785	Ba	Ba	Zn	Zr	Al	Ga	Ga	Sc	2.676	0.787	Ba	Zn	Ti	Ti	Al	Sc	Sc	Y	3.099	0.534	Be	Mg	Ti	Zr	Al	Al	Al	In	3.900	1.521
Be	Cd	Ge	Zr	In	In	In	Sc	2.188	0.671	Be	Ca	Ti	Hf	Ga	Ga	Y	Y	2.676	0.765	Be	Be	Ge	Hf	Al	Sc	Y	Y	3.099	1.024	Be	Be	Mg	Ca	Ge	Ti	Ti	Zr	3.900	1.400	
Mg	Cd	Si	Ge	In	In	In	Sc	2.188	1.023	Ba	Ba	Ge	Ti	In	Sc	Y	Y	2.676	0.956	Ca	Zn	Si	Si	Al	Al	Sc	Y	3.099	0.704	Mg	Mg	Si	Ti	Al	Sc	Sc	Y	3.900	1.523	
Ba	Ba	Si	Ti	Al	In	Ga	Sc	2.188	1.033	Mg	Zn	Sn	Hf	Al	Al	Ga	Ga	2.676	0.787	Ca	Ca	Sr	Zn	Sn	Sn	Ti	Zr	3.099	0.643	Be	Mg	Mg	Ca	Si	Ge	Ge	Sn	3.901	1.598	
Cd	Cd	Ge	Hf	Al	Al	Ga	Sc	2.188	0.705	Mg	Zn	Ge	Sn	Al	Al	Al	Y	2.676	0.954	Sr	Ba	Ti	Ti	Al	Sc	Y	Y	3.099	0.891	Be	Mg	Mg	Zn	Si	Ti	Ti	Hf	3.901	1.474	
Sr	Ba	Ge	Zr	Al	Al	Ga	Ga	2.188	0.855	Be	Zn	Cd	Cd	Si	Sn	Sn	Ti	2.676	1.086	Mg	Sr	Zn	Zn	Si	Si	Sn	Zr	3.099	0.691	Be	Zn	Ge	Ti	Al	Al	Al	Sc	3.902	1.453	
Zn	Zn	Sn	Hf	Al	Al	Ga	In	2.188	0.987	Ca	Zn	Cd	Cd	Si	Sn	Ti	Ti	2.676	0.811	Be	Sr	Sr	Zn	Sn	Zr	Zr	Hf	3.099	0.755	Be	Ca	Ca	Sr	Ti	Zr	Hf	Hf	3.902	1.668	
Be	Cd	Ge	Hf	Al	Al	In	In	2.188	0.649	Ca	Ba	Ba	Cd	Si	Zr	Zr	Hf	2.676	0.966	Mg	Sr	Si	Zr	Ga	Sc	Sc	Sc	3.099	0.708	Be	Ca	Ca	Sr	Sr	Zr	Hf	Hf	3.903	1.498	
Zn	Zn	Ge	Sn	In	Sc	Sc	Y	2.188	0.823	Zn	Zn	Si	Zr	Al	Ga	Y	Y	2.676	1.176	Be	Sr	Sr	Zn	Sn	Ti	Zr	Zr	3.100	0.636	Mg	Ca	Sr	Sr	Si	Ge	Ge	Ti	3.903	1.573	
Ca	Ba	Ge	Hf	Al	Al	Al	Y	2.188	0.978	Ca	Sr	Zn	Cd	Ti	Ti	Hf	Hf	2.676	0.697	Ca	Zn	Hf	Hf	Al	Al	Ga	Sc	3.100	0.617	Be	Sr	Sr	Sr	Si	Ge	Ti	Zr	3.903	1.760	
Sr	Zn	Ti	Ti	Al	In	In	Y	2.189	0.639	Be	Ca	Ti	Ti	Al	In	Y	Y	2.676	0.757	Zn	Zn	Ge	Ti	Cd	Ge	Ti	Zr	Hf	3.100	1.047	Be	Mg	Mg	Sr	Ge	Ti	Ti	Zr	3.905	1.570
Ba	Zn	Si	Ge	Al	Al	Y	Y	2.189																																

Mg	Ca	Si	Sn	Al	Al	Ga	Ga	2.197	0.825	Cd	Cd	Zr	Hf	Al	In	Sc	Sc	2.682	0.865	Mg	Sr	Zn	Cd	Si	Si	Si	Ge	3.107	0.553	Be	Sr	Sr	Ba	Si	Si	Ge	Ti	3.942	0.885	
Mg	Zn	Sn	Sn	Al	Al	Sc	Y	2.197	0.704	Mg	Sr	Ba	Cd	Sn	Hf	Hf	Hf	2.682	1.077	Mg	Ca	Sn	Ti	Sc	Sc	Y	Y	3.107	0.853	Be	Mg	Mg	Sr	Si	Ti	Ti	Hf	3.943	0.873	
Zn	Cd	Ti	Hf	In	In	Y	Y	2.197	0.843	Ca	Cd	Zr	Hf	In	Y	Y	Y	2.682	1.195	Ca	Cd	Zr	Hf	In	Sc	Sc	Sc	3.107	0.641	Mg	Mg	Ca	Sr	Si	Si	Ge	Ti	3.944	0.865	
Ca	Ba	Sn	Ti	Al	Al	Al	In	2.197	0.860	Be	Sr	Ba	Zr	Zr	Ga	Sc	Sc	Y	0.856	Mg	Ca	Si	Ge	Al	Al	Sc	Sc	3.107	0.646	Be	Mg	Ca	Ba	Si	Si	Si	Ge	3.945	0.993	
Ca	Zn	Si	Sn	Al	Al	Al	Y	2.197	0.629	Ca	Zr	Ba	Cd	Ti	Ti	Zr	Hf	2.682	1.083	Sr	Sr	Ba	Zn	Ge	Zr	Zr	Hf	3.108	0.577	Be	Mg	Si	Ti	Ga	Sc	Sc	Sc	3.945	0.944	
Mg	Zn	Ge	Hf	In	In	Ga	Sc	2.197	0.783	Be	Cd	Si	Si	Al	Ga	Ga	In	2.682	1.274	Ca	Ba	Ba	Zn	Zn	Zr	Zr	Hf	3.108	0.522	Be	Mg	Sr	Ba	Si	Si	Ti	Ti	3.945	0.946	
Ba	Zn	Si	Zr	In	Ga	Ga	Sc	2.197	0.870	Zn	Cd	Ti	Zr	Zr	Ga	Ga	In	Y	0.740	Mg	Sr	Ba	Cd	Si	Si	Si	Zr	3.108	0.500	Mg	Ca	Sr	Sr	Si	Si	Ti	Zr	3.945	1.039	
Zn	Cd	Zr	Hf	In	In	Y	Y	2.197	1.020	Mg	Ba	Sn	Ti	Sc	Sc	Sc	Y	2.682	0.827	Be	Ca	Si	Si	Ga	Sc	Sc	Y	3.108	0.895	Mg	Ca	Sr	Sr	Si	Si	Ti	Ti	3.945	0.972	
Zn	Cd	Ti	Zr	Zr	Ga	Ga	In	2.197	0.752	Mg	Ca	Sn	Ti	Sc	Sc	Sc	Y	2.682	0.936	Be	Be	Ca	Zn	Si	Si	Ge	Ge	Hf	3.108	0.600	Mg	Zn	Si	Ti	Sc	Sc	Sc	Y	3.946	0.859
Ba	Zn	Si	Ti	Al	Al	In	In	2.197	0.857	Mg	Ca	Ge	Zr	In	Y	Y	Y	2.683	0.897	Mg	Ba	Cd	Cd	Ti	Zr	Hf	Hf	3.108	0.560	Mg	Ca	Ca	Sr	Si	Si	Zr	Hf	3.947	0.833	
Ba	Zn	Ge	Sn	Al	Al	Sc	Sc	2.197	1.003	Ca	Ba	Si	Ge	Al	Y	Y	Y	2.683	0.859	Be	Be	Sn	Zr	In	Sc	Sc	Y	3.108	0.879	Be	Ca	Ca	Ba	Ge	Ti	Ti	Hf	3.948	0.863	
Ca	Zn	Zn	Cd	Si	Sn	Sn	Ti	2.198	0.871	Zn	Cd	Sn	Zr	In	Sc	Sc	Sc	2.683	0.793	Mg	Ba	Ba	Cd	Ti	Ti	Ti	Hf	3.108	0.677	Be	Mg	Ca	Ca	Ge	Ge	Sn	Ti	3.948	0.841	
Sr	Cd	Cd	Cd	Si	Ge	Zr	Hf	2.198	0.887	Mg	Ca	Si	Zr	Zr	Ga	Ga	Y	2.683	1.010	Mg	Cd	Si	Hf	Al	Al	Al	In	3.108	0.632	Be	Mg	Ca	Ca	Si	Si	Sn	Zr	3.949	0.956	
Mg	Ba	Si	Hf	In	In	Sc	Sc	2.198	0.928	Sr	Ba	Si	Zr	Al	Al	Al	Sc	2.683	0.893	Mg	Sr	Ti	Hf	Al	Al	Al	Ga	3.108	0.862	Be	Be	Ti	Hf	Al	Ga	Ga	Sc	3.949	0.903	
Ba	Cd	Sn	Zr	In	Y	Y	Y	2.198	0.705	Ca	Sr	Sr	Cd	Sn	Ti	Hf	Hf	2.683	0.798	Be	Mg	Ba	Ba	Si	Si	Ge	Sn	3.109	0.678	Be	Sr	Ba	Ba	Si	Si	Ge	Zr	3.949	0.915	
Be	Ca	Ge	Zr	Ga	Ga	In	In	2.198	0.715	Mg	Ba	Zn	Zn	Sn	Sn	Ti	Hf	2.683	0.743	Be	Mg	Ba	Ba	Zn	Ge	Ti	Zr	3.109	0.718	Be	Mg	Zn	Zn	Si	Si	Ti	Zr	3.950	0.994	
Ba	Cd	Sn	Hf	In	Sc	Sc	Sc	2.198	0.605	Sr	Sr	Ge	Ti	Ga	Sc	Sc	Y	2.683	0.710	Be	Be	Ba	Ba	Zn	Si	Ti	Zr	3.109	0.679	Mg	Ca	Ca	Sr	Si	Ge	Ti	Ti	3.950	0.922	
Ba	Zn	Zr	Zr	Zr	Ga	In	Y	2.198	0.871	Be	Ca	Zr	Hf	Ga	Ga	In	In	2.683	0.755	Mg	Mg	Si	Zr	Ga	Ga	Sc	Y	3.109	0.473	Be	Sr	Ba	Ba	Si	Si	Ti	Hf	3.951	0.842	
Mg	Ca	Ga	Ga	Ga	Ga	Ga	In	2.198	0.958	Be	Cd	Cd	Zr	Ga	Ga	Ga	Y	2.684	0.780	Ca	Cd	Hf	Hf	Al	Sc	Sc	Y	3.109	0.461	Be	Ca	Ca	Sr	Si	Si	Sn	Zr	3.951	0.815	
Be	Ba	Cd	Cd	Ge	Sn	Hf	Hf	2.199	0.872	Be	Zn	Si	Sn	Zr	Ga	Sc	Sc	2.684	0.723	Mg	Mg	Zn	Cd	Sn	Zr	Zr	Hf	3.109	0.579	Be	Ca	Ca	Sr	Si	Ti	Hf	Hf	3.952	0.811	
Zn	Zn	Ge	Hf	In	In	Sc	Y	2.199	1.047	Be	Be	Si	Cd	Al	Ga	Y	Y	2.684	0.790	Be	Ca	Si	Si	Al	Ga	Ga	Sc	3.109	0.348	Be	Mg	Mg	Zn	Si	Zr	Hf	3.953	0.820		
Sr	Zn	Ti	Zr	In	In	In	Sc	2.199	1.086	Mg	Cd	Zn	Hf	Ga	Ga	Y	Y	2.684	0.995	Mg	Mg	Sr	Cd	Sn	Ti	Zr	Zr	3.109	0.353	Be	Ca	Ca	Sr	Si	Si	Sn	Hf	3.953	0.806	
Sr	Zn	Ge	Zr	Al	Al	Ga	Ga	2.199	1.001	Be	Ca	Cd	Cd	Ge	Sn	Ti	Ti	2.684	0.898	Sr	Sr	Ba	Zn	Si	Zr	Zr	Hf	3.109	0.877	Be	Be	Mg	Ca	Si	Ge	Hf	Hf	3.954	0.903	
Ca	Ca	Ge	Hf	Ga	Ga	Sc	Y	2.199	0.862	Mg	Mg	Zn	Cd	Ge	Ge	Sn	Zr	2.684	0.860	Mg	Mg	Hf	Hf	Al	In	Sc	Y	3.109	0.401	Be	Ca	Ba	Ba	Si	Si	Ti	Zr	3.956	1.049	
Mg	Sr	Si	Si	Al	In	In	Sc	2.199	1.073	Sr	Zn	Si	Zr	Al	Al	Al	Y	2.684	0.764	Be	Mg	Cd	Cd	Sn	Ti	Hf	Hf	3.110	0.415	Be	Mg	Mg	Sr	Si	Si	Ge	Hf	3.956	0.939	
Mg	Zn	Sn	Zr	Al	Al	In	In	2.199	0.989	Zn	Cd	Zr	Zr	Zr	Ga	Ga	In	Sc	2.684	0.699	Mg	Mg	Ba	Zn	Si	Si	Sn	Zr	3.110	0.586	Be	Be	Si	Ti	Al	Sc	Sc	Y	3.956	0.930
Ba	Cd	Sn	Ti	Al	Al	Al	Ga	2.200	0.827	Ca	Ca	Zr	Zr	Al	In	Sc	Y	2.684	0.783	Be	Be	Sr	Cd	Si	Si	Ti	Zr	3.110	0.537	Be	Ca	Ca	Sr	Si	Ge	Hf	Hf	3.957	0.592	
Mg	Ba	Si	Hf	In	In	In	Sc	2.200	1.068	Mg	Cd	Hf	Hf	Ga	Ga	In	Y	2.684	0.837	Sr	Sr	Si	Ti	Al	Sc	Sc	Y	3.110	0.544	Be	Mg	Mg	Sr	Si	Ti	Ti	Zr	3.958	0.747	
Ca	Cd	Sn	Hf	Al	Al	Al	Y	2.200	0.985	Mg	Ba	Si	Ge	Al	Al	Sc	Sc	2.684	0.714	Be	Be	Sn	Zr	Al	Al	Sc	Y	3.110	0.898	Be	Sr	Ba	Ba	Si	Si	Ge	Hf	3.958	0.636	
Ca	Zn	Ge	Ti	Al	Al	In	In	2.200	1.156	Mg	Zn	Si	Hf	Al	Al	In	In	2.684	0.807	Be	Ca	Ba	Zn	Ge	Zr	Zr	Y	3.110	0.602	Be	Sr	Ba	Ca	Ge	Sn	Hf	Hf	3.958	0.705	
Ba	Cd	Ge	Ge	Al	Sc	Y	Y	2.200	1.099	Ca	Cd	Ti	Hf	Al	Al	In	Y	2.684	0.777	Mg	Ca	Ti	Ti	Al	Al	Ga	In	3.110	0.601	Be	Mg	Ca	Zn	Si	Si	Si	Zr	3.959	0.816	
Mg	Cd	Sn	Hf	Al	Ga	Ga	Ga	2.200	0.838	Mg	Sr	Ba	Cd	Ge	Hf	Hf	Hf	2.684	0.874	Ca	Ca	Ba	Cd	Si	Si	Si	Ti	3.110	0.889	Be	Ca	Ca	Sr	Si	Ti	Zr	Zr	3.960	0.703	
Ca	Ca	Si	Ti	Ga	In	In	Y	2.200	0.969	Mg	Mg	Ge	Sn	Al	Sc	Y	Y	2.684	0.994	Be	Zn	Sn	Hf	Al	Al	Al	Y	3.110	0.680	Be	Mg	Ca	Sr	Ge	Ge	Hf	Hf	3.960	0.660	
Sr	Zn	Zr	Hf	Al	In	In	Sc	2.200	1.081	Sr	Cd	Hf	Hf	Al	Ga	Sc	Sc	2.685	0.828	Sr	Cd	Zr	Hf	Sc	Y	Y	Y	3.110	0.681	Be	Mg	Ca	Sr	Si	Ti	Ti	Ti	3.962	0.915	
Sr	Ba	Si	Sn	Al	Al	Sc	Sc	2.200	0.855	Be	Ba	Si	Hf	Al	Al	Al	In	2.685	0.885	Mg	Mg	Zr	Hf	In	Sc	Y	Y	3.110	0.601	Be	Zn	Si	Ti	Al	Sc	Sc	Sc	3.962	0.727	
Zn	Cd	Ti	Ti	Al	Al	In	In	2.200	0.933	Ca	Zn	Ti	Hf	Ga	Ga	Ga	Y	2.685	1.036	Be	Ca	Hf	Hf	Al	Al	Ga	Y	3.110	0.556	Be	Mg	Ti	Ti	Al	Ga	Ga	Sc	3.963	0.785	
Sr	Zn	Cd	Cd	Si	Ge	Hf	Hf	2.200	1.076	Mg	Ba	Ba	Ba	Sn	Sn	Zr	Hf	2.685	0.646	Be	Ca	Ca	Ba	Si	Ge	Sn	Sn	3.110	0.542	Mg	Mg	Ca	Sr	Si	Si	Zr	Hf	3.963	1.000	
Sr	Sr	Si	Ti	Ga	In	In	Sc	2.200	0.849	Be	Sr	Ge	Ti	Al	Al	Y	Y	2.685	0.681	Be	Cd	Cd	Cd	Si	Sn	Ti	Zr	3.110	0.895	Be	Ca	Ca	Sr	Si	Ge	Zr	Zr	3.965	0.792	
Ca	Ca	Si	Ge	Al	Al	Ga	Y	2.201	0.742	Be	Ba	Hf	Hf	Al	Al	Sc	Sc	Y	2.685	0.750	Mg	Zn	Si	Zr	Al	Al	Y	Y	3.111	0.612	Mg	Mg	Ca	Ca	Si	Ge	Sn	Ti	3.966	0.512
Mg	Sr	Ge	Hf	Al	Al	Ga	Ga	2.201	0.895	Ca	Ba	Ge	Hf	Sc	Sc	Sc	Y	2.685	0.896	Mg	Ba	Ba	Ba	Zn	Si	Si	Zr	Hf	3.111	0.580	Be	Be	Mg	Ca	Ge	Ge	Zr	Hf	3.966	0.492
Ca	Ba	Ge	Ti	Al	Al	In	In	2.201	0.880	Sr	Cd	Ge	Ti	In	Sc	Sc	Sc	2.685	0.862	Sr	Sr	Sr	Ba	Zn	Sn	Ti	Zr	Hf	3.111	0.902	Be	Ca	Ba	Ba	Si	Si	Ti	Hf	3.967	0.553
Be	Mg	Sr	Cd	Ge	Ge	Sn	Sn	2.201	0.705	Be	Ba	Cd	Si	Ge	Al	Al	Ga	2.685	0.804	Sr	Sr	Ba	Ba	Zn	Sn	Zr	Zr	Hf	3.111	0.701	Be	Be	Be	Mg	Si	Ge	Zr	Hf	3.967	0.738
Be	Ba	Zn	Cd	Sn	Sn	Sn	Hf	2.201	0.887	Ba	Ba	Zr	Hf	Ga	Sc	Sc	Y	2.685	1.007	Ca	Ba	Ba	Ba	Zn	Si	Ge	Zr	Hf	3.111	0.641	Be	Be	Si	Ge	Al	Al	Ga	Sc	3.969	0.976
Be	Ba	Si	Si	Al	Ga	Ga	Ga	2.202	0.868	Mg	Mg	Sn	Ti	Al	In	Y	Y	2.685	0.896	Be	Sr	Si	Ti	Al	Al	Al	Y	3.111	0.861	Be	Ca	Ca	Ba	Si	Ge	Ti	Ti	3.969	0.884	
Ca	Zn	Ge	Hf	Al	Ga	Ga	Ga	2.202	0.690	Sr	Zn	Sn	Ti	Al	Y	Y	Y	2.685	0.808	Mg	Ca	Ti	Hf	Al	Al	Y	Y	3.111	0.677	Be	Be	Si	Ti	Al	Al	Ga	Y</			

Be	Ba	Cd	Cd	Ge	Sn	Sn	Zr	2.211	1.320	Be	Ca	Si	Hf	Al	Al	In	In	2.690	0.407	Mg	Mg	Ba	Cd	Si	Ti	Ti	Zr	3.118	0.481	Be	Be	Mg	Ca	Ge	Ti	Hf	4.026	0.911		
Ba	Ba	Si	Hf	Al	Ga	Ga	Sc	2.211	0.989	Ba	Ca	Si	Hf	Al	Al	Y	Y	2.690	0.576	Sr	Ba	Si	Hf	Sc	Sc	Y	Y	3.118	0.531	Mg	Mg	Mg	Ca	Si	Sn	Ti	Zr	4.028	0.720	
Be	Mg	Zn	Cd	Si	Sn	Sn	Sn	2.211	1.104	Mg	Ba	Zn	Sn	Zr	Ga	Ga	Sc	2.690	1.430	Be	Sr	Sr	Zn	Ge	Ti	Zr	Zr	3.118	0.408	Be	Ca	Ca	Ca	Sr	Ge	Ti	Zr	4.030	0.705	
Be	Sr	Ba	Cd	Sn	Sn	Hf	Hf	2.211	1.307	Ba	Ba	Ba	Zn	Zn	Ti	Zr	Hf	2.690	1.333	Be	Zn	Ti	Zn	Al	In	In	Sc	3.118	0.298	Be	Mg	Zr	Hf	Al	Al	Al	Ga	4.031	0.748	
Ca	Ca	Sr	Ge	Ge	Al	Al	Sc	Y	2.211	1.070	Be	Ba	Si	Ge	Sc	Sc	Sc	Y	2.690	1.137	Mg	Sr	Zn	Zn	Si	Ge	Ge	Hf	3.118	0.237	Be	Ca	Ca	Ca	Ge	Sn	Zr	Hf	4.031	0.804
Ca	Ba	Sn	Ti	Ti	Ga	Ga	Sc	Sc	2.211	1.088	Mg	Ba	Ti	Ti	In	Sc	Sc	Y	2.690	1.562	Mg	Zn	Cd	Cd	Si	Ge	Zr	Zr	3.118	0.280	Be	Ca	Ba	Si	Ge	Ge	Zr	4.031	0.970	
Sr	Sr	Si	Hf	Al	Ga	Ga	In	2.211	1.226	Be	Be	Sr	Sn	Ti	Sc	Y	Y	2.690	1.336	Ca	Ba	Ba	Zn	Ge	Zr	Zr	Hf	3.119	0.337	Be	Ca	Ba	Ba	Si	Ge	Ge	Hf	4.032	0.897	
Ba	Zn	Sn	Ti	Al	Al	Al	In	2.212	0.880	Mg	Ca	Zr	Zr	Al	In	Y	Y	2.690	1.172	Mg	Ca	Sr	Ba	Si	Si	Sn	Sn	3.119	0.296	Be	Mg	Mg	Ca	Ge	Ge	Sn	Ti	4.033	0.882	
Ca	Zn	Si	Si	In	In	Sc	Y	2.212	0.892	Be	Ba	Gd	Si	Ti	Ti	Zr	2.690	0.799	Be	Ca	Ca	Cd	Ge	Ti	Ti	Hf	3.119	0.501	Be	Mg	Mg	Ca	Sn	Ti	Hf	4.034	1.015			
Sr	Cd	Hf	Hf	Ga	Ga	In	Y	2.212	0.818	Mg	Ca	Ge	Hf	Al	Al	Ga	Ga	2.690	0.738	Ca	Ba	Ti	Zr	Al	Sc	Sc	Sc	3.119	0.423	Be	Mg	Mg	Ca	Si	Si	Sn	Hf	4.035	0.924	
Sr	Sr	Ti	Zr	Al	In	In	Y	2.212	0.868	Mg	Ba	Ti	Zr	Ga	Y	Y	2.690	1.004	Be	Be	Ba	Ba	Zn	Ti	Ti	Zr	Hf	3.119	0.314	Be	Mg	Ca	Ca	Si	Si	Sn	Ti	4.035	0.733	
Cd	Cd	Ti	Hf	Ga	Ga	In	Y	2.212	0.844	Be	Sr	Cd	Cd	Si	Ge	Zr	Zr	2.690	0.768	Be	Sr	Cd	Cd	Si	Ti	Ti	Zr	3.119	0.251	Be	Mg	Ca	Ca	Sn	Zr	Zr	Hf	4.035	0.716	
Ba	Zn	Hf	Hf	Ga	Ga	In	Y	2.212	0.716	Be	Be	Zn	Sn	Ti	In	In	Sc	Sc	2.690	0.648	Be	Be	Mg	Cd	Ti	Zr	Hf	Hf	3.120	0.256	Be	Mg	Ca	Ba	Si	Si	Hf	Hf	4.037	0.765
Ba	Cd	Si	Ti	Ti	Ga	Ga	Sc	2.212	0.886	Ba	Ba	Zr	Hf	Al	Al	Sc	Y	2.690	1.036	Mg	Ca	Zr	Hf	Ga	Ga	Sc	Sc	3.120	0.245	Be	Ca	Ca	Sr	Ge	Ti	Hf	4.037	0.750		
Mg	Ca	Ge	Hf	In	In	Sc	Sc	2.212	0.927	Sr	Ba	Ge	Hf	Al	Sc	Sc	Sc	2.690	1.643	Zn	Zn	Si	Hf	Al	Sc	Sc	Y	Y	3.120	0.187	Be	Mg	Ca	Sr	Si	Si	Ge	4.040	0.746	
Ba	Ba	Si	Ti	Al	Ga	Ga	Y	2.212	0.793	Be	Ca	Ge	Zr	Ga	Ga	Sc	Sc	2.690	1.501	Ca	Zn	Si	Si	Sc	Sc	Sc	Y	3.120	0.461	Be	Mg	Mg	Ca	Si	Sn	Zr	Zr	4.040	0.918	
Ba	Zn	Cd	Cd	Ge	Ge	Ti	Hf	2.212	0.721	Ca	Cd	Si	Zr	Al	Al	Y	Y	2.690	1.521	Zn	Cd	Ti	Zr	Sc	Sc	Y	Y	Y	3.120	0.360	Mg	Zn	Si	Ti	Al	Al	Al	Sc	4.041	1.037
Be	Be	Si	Sn	Ga	In	Y	Y	2.213	0.890	Be	Ca	Sn	Hf	Sc	Sc	Sc	Y	2.690	0.932	Mg	Mg	Ba	Cd	Cd	Sn	Ti	Ti	Zr	3.120	0.304	Be	Mg	Mg	Ca	Si	Si	Ge	Sn	4.042	0.924
Ba	Cd	Ti	Hf	In	In	Sc	Sc	2.213	0.757	Sr	Sr	Si	Hf	Al	Al	Sc	Y	2.690	0.910	Mg	Mg	Sr	Cd	Ti	Ti	Zr	Hf	3.120	0.315	Be	Mg	Mg	Zn	Si	Ge	Ti	Ti	4.043	0.901	
Sr	Ba	Zn	Zn	Ge	Sn	Sn	Zr	2.213	0.690	Ca	Cd	Sn	Zr	Al	Y	Y	Y	2.690	1.323	Be	Be	Zn	Cd	Ti	Zr	Hf	Hf	3.120	0.397	Be	Mg	Ca	Ca	Sn	Sn	Ti	Zr	4.043	0.815	
Mg	Ca	Cd	Cd	Ge	Sn	Sn	Hf	2.213	0.883	Ca	Sr	Zn	Cd	Si	Si	Si	Zr	2.691	0.934	Zn	Cd	Si	Ge	Al	Al	Al	Sc	3.120	0.273	Be	Mg	Ca	Ba	Si	Si	Zr	Zr	4.045	0.844	
Be	Ca	Ba	Cd	Ge	Ge	Ge	Sn	2.213	0.750	Mg	Sr	Ba	Cd	Si	Si	Ge	Ge	2.691	0.827	Be	Be	Zn	Cd	Ge	Ti	Ti	Hf	3.120	0.534	Mg	Mg	Ca	Ca	Ge	Sn	Zr	Hf	4.046	0.834	
Zn	Cd	Sn	Hf	Ga	Ga	In	Sc	2.213	1.108	Mg	Mg	Zn	Cd	Ge	Sn	Zr	Zr	2.691	1.342	Be	Cd	Ti	Ti	Al	In	Sc	3.120	0.528	Mg	Ca	Ca	Sr	Si	Ge	Ge	Ti	4.046	0.849		
Ba	Ba	Zr	Hf	Al	In	In	Y	2.213	1.161	Sr	Mg	Ti	Zr	Zr	Ga	In	Sc	Sc	2.691	0.998	Mg	Mg	Ti	Zr	Al	Ga	Y	3.120	0.385	Be	Mg	Ca	Sr	Ge	Ge	Ti	Ti	4.050	0.861	
Sr	Cd	Ti	Ti	Ga	In	In	Sc	2.213	0.794	Be	Ba	Ba	Cd	Ti	Ti	Zr	Hf	2.691	1.187	Ca	Sr	Zn	Zn	Ge	Ti	Ti	Zr	3.120	0.379	Be	Be	Ti	Zr	Al	Al	Ga	Sc	4.051	0.851	
Be	Cd	Ge	Ge	Al	Al	In	Y	2.213	0.947	Mg	Mg	Sr	Cd	Si	Ge	Sn	2.691	1.568	Mg	Ca	Ba	Zn	Ge	Ge	Hf	Hf	3.120	0.319	Be	Be	Mg	Ca	Ge	Ge	Ti	Zr	4.052	0.838		
Sr	Sr	Ti	Hf	In	In	Sc	Y	2.213	1.123	Ba	Ba	Zn	Zn	Si	Ge	Sn	2.691	0.978	Ba	Zn	Ti	Hf	Sc	Y	Y	Y	3.120	0.330	Be	Mg	Ca	Zn	Si	Si	Ge	4.055	0.984			
Ba	Cd	Ge	Ti	Al	Al	Al	In	2.213	0.746	Ca	Sr	Ba	Cd	Cd	Sn	Hf	Hf	2.691	1.101	Be	Mg	Cd	Cd	Si	Sn	Ti	Ti	3.120	0.351	Be	Mg	Ti	Ti	Al	Al	Ga	Sc	4.055	0.928	
Ca	Sr	Zr	Hf	In	In	In	Y	2.213	0.917	Mg	Zn	Si	Si	Al	Ga	Ga	Ga	2.691	1.605	Be	Mg	Sr	Ba	Sn	Sn	Sn	Hf	3.121	0.428	Be	Mg	Mg	Ca	Si	Si	Sn	Zr	4.056	0.893	
Ca	Sr	Cd	Cd	Si	Ge	Ge	Zr	2.214	1.115	Be	Sr	Si	Si	Al	In	Sc	Sc	2.691	0.630	Be	Be	Ca	Cd	Ge	Sn	Ti	Ti	3.121	0.343	Mg	Mg	Mg	Ca	Si	Sn	Zr	Hf	4.056	1.016	
Ba	Cd	Ti	Ti	Al	In	In	Y	2.214	0.738	Mg	Mg	Sn	Zr	Ga	In	In	Sc	Sc	2.691	0.632	Mg	Ba	Si	Hf	Sc	Y	Y	Y	3.121	0.556	Mg	Ca	Sr	Ba	Si	Si	Si	Hf	4.058	0.941
Be	Zn	Ge	Hf	In	In	In	Y	2.214	0.793	Ca	Ca	Ti	Zr	Al	Ga	In	In	2.693	0.803	Be	Ca	Sr	Cd	Zr	Hf	Hf	Hf	3.121	0.550	Be	Be	Mg	Mg	Ca	Si	Ge	Sn	Ti	4.058	0.811
Ba	Cd	Ti	Zr	Ga	In	In	Y	2.214	0.881	Mg	Mg	Zn	Ge	Ge	In	Sc	Sc	Y	2.691	0.936	Be	Ca	Ge	Ti	Ga	Sc	Sc	3.121	0.444	Be	Ca	Sr	Sr	Si	Si	Ti	Zr	4.058	0.797	
Ba	Zn	Hf	Hf	In	In	Sc	Y	2.214	0.647	Ca	Sr	Si	Zr	Al	Al	Ga	Ga	2.691	0.867	Be	Sr	Ba	Zn	Ge	Ge	Ge	Zr	3.121	0.423	Be	Mg	Ca	Ca	Ge	Sn	Hf	Hf	4.058	0.815	
Be	Cd	Ge	Ge	Ga	In	Sc	Sc	2.214	0.764	Mg	Sr	Ge	Zr	Al	Al	Al	Sc	2.692	0.752	Ca	Sr	Ti	Ti	Al	Sc	Sc	Y	3.122	0.368	Be	Ca	Ca	Sr	Si	Ti	Ti	Zr	4.060	0.802	
Ba	Zn	Ti	Ti	In	In	Sc	Y	2.215	0.870	Mg	Ba	Cd	Zn	Si	Sn	Sn	Ti	2.692	1.065	Be	Be	Sn	Zr	Al	Al	In	Sc	3.122	0.381	Be	Mg	Zr	Hf	Al	Al	Al	Sc	4.060	0.933	
Mg	Sr	Si	Ge	Al	Al	Ga	Ga	2.215	0.631	Be	Cd	Zr	Hf	Al	Y	Y	Y	2.692	0.882	Be	Sr	Cd	Cd	Ti	Ti	Zr	Hf	3.122	0.455	Mg	Ca	Ca	Ba	Si	Si	Ge	Ti	4.060	0.872	
Ca	Cd	Si	Hf	Ga	Ga	Y	Y	2.215	0.887	Be	Ca	Ti	Zr	Ga	Ga	In	In	2.692	0.788	Ba	Zn	Si	Ti	Sc	Sc	Y	Y	3.122	0.419	Be	Ca	Ca	Sr	Si	Ge	Ge	Ti	4.060	0.852	
Be	Ba	Sn	Hf	Al	Y	Y	Y	2.215	0.903	Sr	Ba	Ti	Zr	Al	Al	Ga	Ga	2.692	0.587	Be	Cd	Ti	Zr	Sc	Ga	Ga	Y	3.122	0.576	Be	Mg	Si	Hf	Al	Al	Al	Ga	4.060	0.958	
Be	Ba	Ge	Hf	Ga	Ga	Sc	Sc	2.215	0.557	Mg	Sr	Ba	Cd	Sn	Zr	Zr	Zr	2.692	0.529	Be	Mg	Cd	Cd	Si	Si	Sn	Ti	3.122	0.433	Be	Mg	Ge	Ti	Al	Al	Al	Ga	4.061	0.878	
Zn	Zn	Si	Sn	Sn	Sc	Y	Y	2.215	1.171	Be	Sr	Ti	Hf	Ga	Ga	Ga	Y	2.692	0.706	Be	Mg	Zr	Hf	Al	Al	Y	Y	3.122	0.326	Mg	Ca	Sr	Ba	Si	Si	Si	Zr	4.064	0.786	
Ba	Cd	Ti	Hf	Ga	Ga	Ga	Y	2.215	1.217	Ca	Sr	Ti	Hf	Al	Al	Ga	Ga	2.692	0.613	Mg	Mg	Sr	Zn	Ge	Ge	Sn	Zr	3.122	0.267	Be	Ca	Ca	Sr	Si	Ti	Ti	Hf	4.065	0.770	
Ca	Cd	Si	Zr	Al	Al	In	In	2.215	0.986	Be	Be	Sr	Zn	Ge	Ge	Sn	Zr	2.692	0.507	Be	Sr	Cd	Cd	Si	Ti	Ti	Hf	3.122	0.285	Mg	Ca	Ca	Sr	Si	Ti	Ti	Hf	4.066	0.751	
Be	Ca	Si	Ge	In	Y	Y	Y	2.215	1.006	Ca	Sr	Ba	Cd	Ge	Hf	Hf	Hf	2.692	0.770	Be	Be	Mg	Cd	Si	Ti	Hf	Hf	3.122	0.266	Be	Ca	Sr	Sr	Si	Si	Ti	Hf	4.067	0.775	
Mg	Mg	Ge	Ge	Al	Ga	In	Y	2.216	1.182	Be	Cd	Ba	Zn	Ge	Sn	Zr	Zr	2.692	1.077	Be	Cd	Ge	Hf	Al	Al	Al	Y	3.122	0.213	Be	Mg	Mg	Ba	Si	Si	Ti	Hf	4.067	0.772	
Sr	Cd																																							

Mg	Ba	Ge	Sn	Sc	Y	Y	Y	2.224	0.742	Mg	Zn	Ti	HF	Ga	Ga	In	In	2.697	1.323	Mg	Zn	Zr	Zr	Al	Al	Ga	Ga	In	3.128	0.366	Be	Mg	Si	Zr	Al	Al	Al	Sc	4.155	0.891	
Ca	Zn	Sn	Sn	Al	Sc	Y	Y	2.224	0.765	Ca	Ca	Ti	Zr	Al	Ga	Ga	Y	2.697	0.899	Ca	Ca	Ba	Zn	Ge	Ge	Sn	Ti	3.128	0.627	Be	Mg	Mg	Si	Si	Ti	HF	4.156	1.170			
Be	Cd	Ti	HF	Ga	Ga	In	In	2.225	0.800	Be	Ca	Ti	Ti	Al	Al	Ga	Ga	2.697	0.885	Ca	Ba	Ti	HF	Sc	Y	Y	Y	3.128	0.535	Be	Mg	Mg	Sr	Si	Si	Zr	4.156	1.035			
Ba	Ba	Cd	Cd	Sn	Ti	Zr	HF	2.225	0.882	Mg	Mg	Ge	HF	Ga	Ga	Sc	Y	2.698	1.158	Sr	Cd	Zr	HF	Al	Sc	Sc	Ti	3.128	0.433	Mg	Ca	Ca	Ca	Si	Ge	Sn	Ti	4.157	0.580		
Mg	Cd	Si	Si	Al	Ga	In	In	2.225	0.875	Ca	Sr	Cr	Cd	Ge	Ge	Ti	HF	2.698	0.834	Be	Ca	Zn	Cd	Ge	Ge	Ge	Ti	3.128	0.352	Be	Mg	Ca	Ba	Si	Si	Ti	4.158	0.529			
Zn	Cd	Si	Zr	Al	Al	In	In	2.225	0.765	Mg	Zn	HF	HF	Ga	Ga	In	In	2.698	0.792	Be	Cd	Ti	HF	Ga	Ga	Sc	Sc	3.128	0.377	Be	Mg	Mg	Ca	Ti	Zr	HF	HF	4.159	0.683		
Mg	Ba	Ge	Ti	Zr	Al	Ga	Ga	2.225	0.958	Mg	Ca	Ca	Cd	Ge	Sn	Zr	Zr	2.698	1.196	Be	Be	Zn	Cd	Cd	Ti	Ti	Zr	HF	3.128	0.367	Be	Be	Mg	Ca	Si	Ti	HF	4.160	0.654		
Mg	Cd	Ge	Ge	Al	Al	In	Sc	2.225	0.966	Mg	Sr	Ge	Ti	In	Sc	Y	Y	2.698	1.784	Ca	Sr	Zn	Zn	Ti	Ti	Zr	HF	3.128	0.289	Be	Be	Mg	Mg	Si	Sn	Ti	Zr	4.161	0.621		
Be	Sr	Cd	Cd	Sn	Sn	Zr	HF	2.226	0.851	Mg	Sr	Zn	Cd	Ge	Ge	HF	HF	2.698	1.652	Ca	Zn	Si	HF	Al	Al	Al	Sc	3.128	0.579	Be	Ca	Ba	Ba	Si	Si	Ti	Zr	4.162	0.953		
Ba	Zn	Ge	HF	Al	Al	Sc	Sc	2.226	0.792	Sr	Zn	Si	Ti	Al	Al	Ga	Ga	2.698	1.678	Be	Be	Ti	Zr	Ga	Sc	Y	Y	3.129	0.487	Be	Mg	Mg	Ca	Ge	Ti	HF	HF	4.163	1.693		
Ca	Zn	Sn	HF	Al	Al	Ga	Ga	2.226	0.922	Mg	Ca	Ge	HF	Al	Al	Y	Y	2.698	1.023	Be	Cd	Sn	Ti	Sc	Sc	Sc	Y	3.129	0.411	Be	Ca	Ca	Sr	Si	Si	Ge	Ti	4.164	1.542		
Mg	Ca	Zn	Cd	Sn	Sn	Sn	Zr	2.226	0.808	Mg	Sr	Sn	Ti	Al	Y	Y	Y	2.698	1.073	Mg	Ca	Si	Zr	Al	Al	Ga	Ga	3.129	0.424	Be	Ca	Ca	Si	Ge	Sn	HF	4.167	1.374			
Be	Ba	Cd	Cd	Ge	Sn	Zr	Zr	2.226	0.761	Mg	Zn	HF	HF	Ga	In	In	Y	2.698	1.484	Be	Sr	Cd	Cd	Si	Ti	Ti	Zr	3.129	0.900	Be	Ca	Ca	Ca	Ge	Sn	Ti	Zr	4.167	1.003		
Ca	Ca	Zn	Cd	Ge	Ge	Zr	HF	2.226	0.914	Ca	Ba	Ba	Zn	Si	Sn	HF	HF	2.698	0.992	Mg	Zn	HF	HF	Al	Al	Ga	In	3.129	0.367	Be	Mg	Ca	Ca	Sn	Ti	HF	4.167	1.208			
Ca	Cd	Ge	Ge	Al	Al	Sc	Y	2.226	0.800	Sr	Cd	Ge	HF	Al	Sc	Sc	Sc	2.698	0.985	Cd	Cd	Si	Ti	Ga	Sc	Sc	Y	3.129	0.641	Be	Ca	Ca	Ca	Si	Ge	Sn	Zr	4.167	1.048		
Ca	Ba	Ti	HF	In	Al	In	Sc	2.226	1.153	Mg	Ba	Ba	Zn	Si	Sn	HF	HF	2.698	1.509	Be	Be	Ge	Si	Ti	Al	Ga	In	In	3.129	0.638	Be	Mg	Mg	Ga	Ca	Si	Zr	HF	4.168	1.088	
Ca	Ca	Ge	Ti	Ga	In	Y	Y	2.226	1.160	Be	Be	Be	Cd	Si	Sn	Zr	HF	2.699	1.089	Be	Zn	Zr	Zr	Al	Ga	Ga	In	3.129	0.485	Be	Mg	Si	Ti	Al	Sc	Sc	Sc	4.169	1.196		
Mg	Cd	Ge	HF	Ga	Ga	Y	Y	2.226	0.834	Ca	Cd	Zr	Zr	Al	Ga	Ga	Y	2.699	1.336	Mg	Zn	Si	Zr	Zr	Al	Ga	Ga	Ga	3.129	0.432	Be	Ca	Ca	Ba	Si	Si	Ti	HF	4.169	1.041	
Sr	Ba	Zn	Zn	Ge	Sn	Zr	Zr	2.226	0.990	Be	Sr	Ti	Ti	Al	Ga	Y	Y	2.699	1.711	Mg	Ba	Ti	Zr	Sc	Sc	Y	Y	3.129	0.381	Be	Mg	Mg	Ca	Sr	Si	Ti	Ti	4.169	1.083		
Ca	Zn	Ge	Sn	In	Sc	Sc	Sc	2.226	1.116	Ca	Sr	Zn	Cd	Ge	HF	HF	HF	2.699	1.035	Zn	Zn	Cd	Cd	Si	Ti	Zr	HF	3.129	0.436	Be	Mg	Mg	Sr	Si	Si	Ti	Zr	4.170	1.414		
Sr	Cd	Zr	Zr	Ga	In	Y	Y	2.226	0.781	Be	Ca	Si	Sn	Al	Al	Sc	Sc	2.699	1.246	Be	Zn	Sn	Ti	Sc	Sc	Y	Y	3.129	0.455	Be	Ca	Ca	Ga	Ge	Sn	Ti	HF	4.171	1.176		
Be	Sr	Ba	Cd	Sn	Sn	Zr	Zr	2.226	0.958	Cd	Cd	Si	HF	In	Sc	Y	Y	2.699	1.754	Sr	Ba	Ba	Zn	Si	Si	Ge	HF	3.129	0.526	Be	Mg	Ti	Zr	Al	Al	Al	Ga	4.171	1.183		
Ba	Ba	Ge	Ti	Ga	Ga	Sc	Y	2.226	1.107	Sr	Cd	Si	Zr	In	Y	Y	Y	2.699	0.702	Be	Ca	Ge	Zr	Al	Al	Al	Sc	3.129	0.452	Be	Ca	Ca	Sr	Si	Si	Ge	HF	4.172	1.417		
Mg	Sr	Ge	Ti	Al	Al	In	In	2.227	0.771	Be	Ca	Si	Zr	In	Y	Y	Y	2.699	0.733	Sr	Sr	Ba	Zn	Si	Si	Ti	Zr	3.129	0.656	Be	Ca	Ca	Sr	Si	Si	Ge	Zr	4.174	1.166		
Mg	Sr	Zn	Cd	Sn	Sn	Sn	Ti	2.227	0.849	Ca	Zn	Sn	HF	Sc	Sc	Y	Y	2.699	0.913	Mg	Mg	Ba	Zn	Si	Si	Ge	Sn	3.130	0.654	Be	Mg	Mg	Ca	Ti	Zr	Zr	HF	4.175	0.847		
Cd	Cd	Ge	Ge	Al	In	Sn	Sc	2.227	0.940	Be	Sr	Zr	Zr	Al	In	Sc	Sc	2.699	1.068	Be	Ca	Si	Ge	Sc	Sc	Y	Y	3.130	0.559	Mg	Ca	Ca	Ca	Sn	Ti	HF	4.175	0.794			
Be	Cd	Zr	HF	Ga	In	In	In	2.227	0.734	Be	Ba	Ba	Cd	Ti	Zr	Zr	HF	2.699	0.979	Ca	Ca	Ba	Zn	Si	Sn	Ti	Ti	3.130	0.470	Be	Mg	Ca	Ca	Sn	Ti	Ti	Zr	4.178	0.862		
Be	Ba	Zn	Cd	Si	Si	Sn	Sn	2.227	0.819	Be	Ba	HF	HF	Al	Al	In	Sc	2.699	0.871	Be	Sr	Sr	Zn	Si	Si	Sn	Zr	3.130	0.423	Mg	Ca	Ca	Ca	Si	Sn	Ti	Zr	4.179	1.168		
Ca	Cd	Ge	Sn	Al	Y	Y	Y	2.227	0.928	Zn	Zn	Sn	Ti	Ga	Sc	Y	Y	2.699	1.189	Ba	Cd	Ti	Zr	Sc	Y	Y	Y	3.130	0.502	Be	Be	Mg	Mg	Ge	Ti	Zr	HF	4.180	1.490		
Ca	Ba	Ti	Ti	Ga	In	In	Y	2.227	0.718	Be	Ca	HF	HF	Ga	Sc	Y	Y	2.699	0.994	Be	Ca	Si	Ti	Zr	Al	Ga	Ga	Ga	3.130	0.504	Be	Mg	Ca	Ca	Ge	Ti	HF	HF	4.183	1.397	
Be	Sr	Zr	HF	Al	In	In	In	2.227	0.927	Sr	Ba	Sn	Ti	Al	Y	Y	Y	2.700	0.916	Be	Be	Be	Ca	Si	Ge	Sn	HF	3.130	0.476	Be	Mg	Mg	Ca	Sn	Ti	Ti	HF	4.186	1.256		
Sr	Ba	Zn	Zn	Si	Sn	Zr	Zr	2.227	0.943	Sr	Sr	Ti	Zr	Al	Al	Ga	Sc	2.700	0.569	Be	Mg	Ti	Zr	In	In	Sc	3.130	0.687	Be	Mg	Mg	Ca	Si	Si	Sn	Ti	4.186	1.485			
Ca	Sr	Zn	Zr	Al	Al	Al	Sc	2.227	0.647	Mg	Zn	Ge	HF	Al	Al	Y	Y	2.700	0.649	Be	Mg	Sn	Al	Al	Ga	Ga	Ga	3.130	0.542	Mg	Mg	Mg	Ca	Ge	Ti	Zr	HF	4.186	1.373		
Ba	Zn	Sn	Zr	In	Y	Y	Y	2.228	1.240	Ca	Cd	Ge	HF	In	Sc	Sc	Sc	2.700	0.834	Be	Mg	Si	Cd	Ge	Al	Y	Y	Y	3.130	0.443	Mg	Ca	Ca	Ca	Si	Ge	Zr	HF	4.187	0.944	
Sr	Ba	Zn	Cd	Si	Si	Ge	Sn	2.228	1.242	Sr	Cd	HF	HF	Al	Al	Ga	Sc	2.700	0.651	Mg	Mg	Sr	Cd	Ge	Ti	Zr	Zr	3.130	0.366	Be	Be	Mg	Ca	Si	Si	Ti	Zr	4.187	0.896		
Sr	Zn	Sr	Zr	Al	Al	Sc	Sc	2.228	1.034	Mg	Sr	Sn	Zr	Sc	Sc	Y	Y	2.700	0.623	Be	Be	Ca	Cd	Ge	Ge	Ti	HF	3.130	0.404	Be	Mg	Mg	Zn	Si	Si	Ge	Ti	4.191	1.075		
Mg	Ba	Si	Zr	Ga	Ga	Ga	In	2.228	1.073	Be	Ca	Si	Ti	In	In	Sc	Sc	2.700	0.904	Mg	Sr	Si	Si	Al	Al	Sc	Y	3.130	0.385	Be	Mg	Mg	Ca	Ti	Ti	Zr	HF	4.191	1.004		
Ca	Ca	Ge	Zr	Al	Ga	Ga	Sc	2.228	1.201	Be	Zn	Ti	HF	Ga	Ga	In	In	2.700	1.193	Mg	Ca	Ti	Zr	Al	Al	Y	Y	3.130	0.312	Be	Mg	Ti	Zr	Al	Al	Al	Sc	4.196	0.975		
Mg	Ba	Si	Ge	Al	Al	Al	In	2.228	0.982	Mg	Ca	Sn	HF	Al	Y	Y	Y	2.700	1.073	Be	Mg	Ge	Sn	Sc	Sc	Sc	Y	3.130	0.604	Be	Mg	Mg	Ga	Ca	Ge	Ti	Zr	4.198	1.308		
Ba	Zn	Ti	Ge	Al	Al	In	In	2.228	1.040	Sr	Sr	Ba	Zn	Si	Sn	HF	HF	2.701	1.092	Be	Zn	Si	Ti	In	In	Sc	Sc	3.130	0.506	Mg	Mg	Mg	Ca	Si	Ge	Ti	HF	4.199	1.022		
Sr	Cd	Si	Ge	Al	Al	Y	Y	2.228	1.193	Be	Sr	Ba	Zn	Si	Sc	Sc	Y	Y	2.701	0.703	Sr	Zn	Si	Ti	In	Al	Y	Y	Y	3.131	0.435	Be	Mg	Ca	Ca	Ge	Ti	Zr	HF	4.203	0.854
Cd	Cd	Si	Sn	Al	Al	Sc	Y	2.228	0.973	Be	Ba	Cd	Cd	Sn	Ti	HF	HF	2.701	0.723	Be	Ba	Si	Ti	Al	Al	Al	Sc	3.131	0.448	Be	Mg	Ca	Ca	Si	Si	Ge	HF	4.203	0.764		
Be	Ca	Ge	HF	In	In	Sc	Sc	2.228	0.922	Ba	Cd	Zr	HF	Ga	Y	Y	Y	2.701	0.979	Mg	Sr	Ti	Ti	Al	Sc	Y	Y	3.131	0.514	Be	Mg	Mg	Ca	Sn	Ti	Ti	Zr	4.204	0.506		
Mg	Ba	Sn	HF	Al	Al	Al	Sc	2.228	1.019	Zn	Zn	Ge	Ti	Ga	Ga	Sc	Y	2.701	0.731	Be	Sr	Zn	Cd	Cd	Ge	Ti	Ti	Ti	3.131	0.389	Mg	Ca	Ca	Ca	Ge	Ti	Zr	HF	4.204	0.599	
Ca	Zn	Ge	Ge	In	Sc	Y	Y	2.228	0.942	Mg	Ba	Ti	HF	Ga	Ga	Ga	Sc	2.701	0.703	Zn	Cd	Si	Si	Al	Al	Ga	Sc	3.131	0.662	Be	Mg	Mg	Ca	Ca	Ge	Sn	Ti	4.204			

Ba	Ba	Ge	Zr	Al	Ga	Y	Y	2.237	0.493	Mg	Mg	Ge	Ti	Ga	In	In	Sc	2.708	1.353	Zn	Cd	Ge	Zr	Al	Sc	Sc	Sc	3.139	0.442	Be	Mg	Mg	Mg	Si	Ge	Ti	Hf	4.758	0.631	
Be	Ba	Ba	Ba	Cd	Ge	Sn	Sn	Ti	2.237	0.397	Ca	Sr	Sr	Cd	Ge	Ge	Ti	Zr	2.708	1.247	Mg	Zn	Zr	Zr	Ga	Ga	In	Sc	3.139	0.744	Be	Mg	Mg	Mg	Si	Ge	Ti	Zr	4.786	0.691
Be	Zn	Ge	Ti	Ga	In	In	In	2.237	0.462	Sr	Sr	Si	Zr	In	Sc	Sc	Y	2.708	1.258	Be	Cd	Si	Si	Al	Al	In	Sc	3.139	0.636											
Be	Ba	Si	Ge	Al	Al	Al	In	2.237	0.495	Zn	Zn	Zr	Hf	Al	Al	In	Y	2.708	0.829	Be	Cd	Si	Ti	Al	Al	Y	Y	3.139	0.553											

Table S4 (g): 7 types of cations

Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)									
Ba	Cd	Ge	Sn	Ga	In	In	Y	0.510	0.021	Sr	Ba	Zn	Cd	Si	Ge	Ge	HF	2.061	0.885	Sr	Cd	Ge	Ti	In	Sc	Sc	Y	2.506	0.834	Be	Sr	Ba	Zn	Si	Ge	HF	HF	2.909	0.725																				
Ba	Cd	Sn	Sn	Al	Ga	In	Y	0.516	-0.035	Sr	Zn	Ti	HF	Al	In	In	Sc	Y	2.062	0.983	Sr	Zn	Zn	Cd	Si	Ti	Zr	HF	2.506	0.914	Mg	Sr	Zr	HF	Al	Al	Sc	Y	2.909	0.860																			
Mg	Ba	Ge	Sn	Ga	In	In	Y	0.523	-0.045	Mg	Ba	Sn	Ti	Al	In	Sc	Sc	2.062	0.775	Ca	Ba	Zn	Cd	Ge	Ti	Zr	Zr	2.507	0.929	Ca	Ba	Zr	HF	Al	Sc	Y	Y	2.909	0.872																				
Be	Ba	Ge	Sn	Ga	In	In	Y	0.548	-0.184	Ca	Ba	Ge	HF	Al	Al	Ga	In	2.062	0.847	Ca	Ba	Sn	HF	Al	Sc	Sc	Y	2.507	0.994	Mg	Ca	Ba	Zn	Si	Sn	HF	HF	2.909	0.950																				
Sr	Cd	Ge	Sn	Ga	In	In	Y	0.568	-0.202	Ca	Ca	Ge	HF	Al	In	Sc	Y	2.062	0.976	Be	Zn	Ge	Ge	Al	Ga	In	Sc	2.507	1.113	Mg	Ca	Zn	Cd	Sn	Ti	Zr	Zr	2.909	1.056																				
Sr	Cd	Sn	Sn	Al	Ga	In	Y	0.579	-0.212	Mg	Ca	Ge	Zr	In	In	Sc	Y	2.062	0.768	Mg	Zn	Cd	Ti	Zr	Al	In	In	Sc	2.507	0.996	Ca	Cd	Zr	HF	Al	Ga	Sc	Sc	2.910	0.928																			
Ba	Cd	Ge	Sn	Al	Ga	In	Y	0.584	0.026	Sr	Cd	Si	Si	Al	Ga	In	Sc	2.062	0.687	Mg	Zn	Sn	Zr	Zr	Al	Al	Ga	In	2.507	1.015	Ca	Zn	Ti	Zr	Al	Al	Ga	Y	2.910	0.886																			
Ba	Cd	Ge	Sn	Al	Ga	In	In	0.592	0.010	Be	Ba	Ge	Zr	Al	Ga	Ga	Y	2.062	0.837	Be	Sr	Ba	Cd	Si	Si	Ge	HF	HF	2.508	1.192	Be	Ba	Cd	Cd	Si	Ti	Zr	HF	2.910	1.108																			
Mg	Sr	Ge	Sn	Ga	In	In	Y	0.614	0.002	Ca	Zn	Ge	Zr	Al	Ga	Ga	Y	2.062	0.813	Ca	Ba	Zn	Zn	Si	Sn	Ti	Zr	2.508	1.054	Be	Mg	Ba	Cd	Si	Ge	Ge	Ti	2.910	0.961																				
Mg	Ba	Sn	Sn	Al	Ga	In	Y	0.624	-0.034	Be	Zn	Si	Sn	Ga	Ga	In	Y	2.063	0.649	Ca	Sr	Zn	Cd	Si	Si	Ti	Zr	2.508	0.836	Mg	Ba	Ba	Zn	Si	Ge	Sn	Zr	2.910	0.699																				
Sr	Cd	Ge	Sn	Al	Ga	In	In	0.636	0.085	Ca	Zn	Si	Zr	Al	In	In	Y	2.063	0.827	Zn	Cd	Ge	HF	In	Sc	Sc	Y	Y	2.508	0.913	Zn	Zn	Si	Ti	Al	In	Sc	Y	2.910	0.826																			
Ca	Ba	Ge	Sn	Ga	In	In	Y	0.636	0.069	Ca	Cd	Ge	Zr	Ga	Ga	Sc	Y	2.063	0.798	Be	Zn	Ge	Sn	Al	Al	Ga	Y	2.508	0.947	Mg	Ba	Ba	Zn	Si	Ge	Zr	HF	2.910	0.863																				
Ca	Ba	Ge	Sn	Ga	In	In	Y	0.647	0.052	Mg	Ba	Ge	Zr	Al	In	Sc	Y	2.063	0.642	Ca	Cd	Si	Ti	Al	Ga	Y	Y	2.508	0.852	Mg	Ca	Ti	Zr	Zr	Al	Ga	Y	Y	2.910	0.689																			
Sr	Cd	Ge	Sn	Al	In	In	Y	0.647	0.001	Ba	Cd	Si	Ti	Al	Ga	Ga	Y	2.063	0.669	Sr	Sr	Ba	Cd	Ge	Sn	Ti	Zr	2.508	0.947	Sr	Ba	Si	HF	Ga	Sc	Y	Y	2.910	0.827																				
Mg	Ba	Ge	Sn	Al	Ga	In	Y	0.659	0.024	Ba	Cd	Si	Si	Al	In	Sc	Y	2.063	0.681	Ca	Ba	Ba	Cd	Sn	Ti	Zr	2.508	1.148	Mg	Ca	Ba	Cd	Ti	Ti	Zr	HF	2.911	0.911																					
Be	Sr	Ge	Sn	Al	Ga	In	Y	0.662	-0.446	Mg	Ba	Sn	HF	Al	Ga	Sc	Sc	2.064	1.090	Sr	Cd	Si	Cd	Si	Ge	Sn	Ti	2.508	1.132	Mg	Ca	Ba	Cd	Si	Ge	Sn	Y	Y	2.911	1.146																			
Be	Sr	Ge	Sn	Ga	In	In	Y	0.667	-0.474	Mg	Cd	Sn	Ti	Ga	In	In	Sc	2.064	1.029	Be	Sr	Ba	Cd	Ge	Ge	Zr	HF	2.509	1.128	Sr	Ba	Si	Ti	Al	Al	Sc	Y	2.911	1.193																				
Ba	Cd	Ge	Sn	Ga	In	In	Sc	0.668	-0.479	Ca	Zn	Ge	Zr	Al	Al	In	Y	2.064	0.904	Sr	Ba	Ti	HF	Al	Al	Ga	In	2.509	1.049	Be	Mg	Zr	HF	In	Sc	Y	Y	2.911	1.143																				
Ba	Zn	Sn	Sn	Al	Ga	In	Y	0.669	-0.517	Be	Ba	Si	Ge	Al	Al	Ga	Y	2.064	0.876	Mg	Sr	Zn	Cd	Ge	Ge	Zr	HF	2.509	0.964	Mg	Zn	Ge	HF	Ga	Sc	Y	Y	2.911	1.026																				
Ca	Ba	Sn	Sn	Al	Ga	In	Y	0.670	-0.529	Ba	Cd	Ti	Zr	Ga	Ga	In	Y	2.064	0.995	Mg	Ba	Cd	Cd	Si	Ge	Ti	HF	2.509	1.093	Mg	Cd	Sn	Ti	Al	Sc	Sc	Y	Y	2.911	1.136																			
Sr	Ba	Ge	Sn	Ga	In	In	Y	0.672	-0.475	Zn	Cd	Ge	Zr	Al	In	Y	Y	2.064	0.862	Be	Ba	Si	Zr	In	Sc	Sc	Y	2.509	1.016	Be	Mg	Sr	Cd	Sn	Zr	Zr	HF	2.911	1.081																				
Ba	Cd	Sn	Sn	Al	Ga	In	Sc	0.672	-0.284	Mg	Ba	Ge	HF	Al	Ga	Ga	Sc	2.064	0.835	Ca	Zn	Zn	Cd	Si	Sn	Ti	Zr	2.509	0.976	Be	Zn	Ge	Ti	Al	Al	In	Y	2.912	0.956																				
Ba	Cd	Ge	Sn	Ga	In	In	Y	0.676	-0.295	Mg	Sr	Ge	Zr	Al	Ga	Ga	Y	2.064	0.988	Be	Ba	Zn	Ge	Zr	In	In	Sc	Y	2.509	1.158	Sr	Sr	Ba	Zn	Si	Ge	Sn	Ti	2.912	1.179																			
Be	Ba	Sn	Sn	Ga	In	In	Sc	0.676	-0.242	Ca	Cd	Si	HF	Ga	In	Y	Y	2.064	0.853	Be	Ba	Ti	Zr	Al	Ga	Ga	In	2.509	1.082	Mg	Ca	Cd	Cd	Si	Ge	Sn	HF	2.912	1.119																				
Ca	Sr	Ge	Sn	Ga	In	In	Y	0.681	-0.229	Be	Ba	Ge	Ti	Ga	Ga	In	Sc	2.064	0.659	Mg	Mg	Ge	HF	Ga	In	Sc	Y	2.509	1.043	Be	Be	Sn	Ti	Ga	In	Sc	Y	2.912	1.101																				
Mg	Ba	Ge	Sn	Ga	In	In	Sc	0.687	-0.224	Ca	Sr	Cd	Cd	Si	Ge	Sn	Ti	2.065	0.822	Be	Sr	Si	HF	Al	Ga	Ga	Y	2.509	1.167	Be	Cd	Ti	HF	Al	Sc	Y	Y	2.912	1.166																				
Mg	Ba	Sn	Sn	Ga	In	In	Sc	0.695	-0.235	Ca	Cd	Ge	Zr	Al	Al	Ga	In	2.065	0.892	Sr	Ba	Ti	Zr	Al	Al	Ga	Y	2.509	0.996	Be	Mg	Ge	Zr	In	Sc	Y	Y	2.912	1.011																				
Be	Ba	Sn	Sn	Ga	In	In	Sc	0.699	-0.194	Ca	Sr	Ge	HF	Al	In	Y	Y	2.066	0.618	Mg	Ca	Sn	Zr	Zr	Al	Al	Sc	Y	2.509	1.068	Be	Ca	Sr	Zn	Si	Sn	Zr	Y	2.912	1.041																			
Be	Ba	Sn	Sn	Al	Ga	In	Y	0.705	-0.200	Ca	Ba	Si	HF	In	In	Sc	Y	2.066	0.811	Mg	Ca	Si	Ge	Al	Al	In	Sc	2.510	1.251	Be	Ca	Zr	HF	Al	Al	In	Y	2.912	1.028																				
Ca	Sr	Sn	Sn	Al	Ga	In	Y	0.707	-0.158	Mg	Cd	Ge	Ti	Ga	In	In	Y	2.066	0.876	Ca	Cd	HF	HF	Al	In	Sc	Y	2.510	1.059	Sr	Cd	Si	Ti	Ga	Sc	Sc	Y	2.912	1.049																				
Sr	Zn	Ge	Sn	Ga	In	In	Y	0.712	-0.053	Ca	Ba	Si	Ge	Al	Al	In	Sc	2.066	0.609	Ca	Ba	Si	HF	Al	Al	Ga	Sc	2.510	0.861	Ca	Zn	Ge	Zr	Al	Sc	Sc	Y	2.912	0.854																				
Mg	Sr	Sn	Sn	Al	Ga	In	Y	0.716	-0.080	Be	Zn	Sn	HF	Ga	In	Y	Y	2.066	0.638	Cd	Ca	Zn	Zn	Cd	Ge	Sn	Ti	Zr	2.510	0.939	Mg	Ca	Sr	Cd	Sn	Ti	Ti	Zr	2.913	0.981																			
Ba	Zn	Ge	Sn	Al	Ga	In	In	0.720	-0.199	Be	Sr	Sn	Ti	Al	Al	Ga	Y	2.066	0.678	Be	Sr	Ti	HF	Ga	Ga	In	Y	2.511	1.007	Mg	Zn	Si	HF	Ga	Ga	Sc	Y	2.913	1.005																				
Be	Ba	Ge	Sn	Al	In	In	Y	0.721	-0.210	Be	Ba	Si	HF	Ga	In	Y	Y	2.066	0.842	Be	Mg	Sn	Zr	Al	Ga	Y	Y	2.511	1.114	Mg	Sr	Ba	Cd	Cd	Si	Si	Ge	Zr	2.913	1.045																			
Ca	Ba	Ge	Sn	Al	In	In	Y	0.724	-0.153	Ca	Sr	Ge	Zr	Ga	In	Y	Y	2.066	1.072	Ba	Ba	Sn	Ti	Al	Ga	Sc	Sc	Y	2.511	1.000	Be	Zn	Ge	Zr	Al	Al	In	Sc	2.913	0.928																			

Ca	Ba	Ge	Sn	In	In	Sc	Y	0.9222	0.462	Be	Sr	Sn	Zr	Al	Al	In	Sc	2.082	0.668	Be	Mg	Ca	Cd	Si	Sn	Sn	HF	2.522	0.909	Mg	Ca	Si	Zr	Al	Ga	Ga	Sc	2.924	0.786	
Ba	Cd	Ge	Sn	Al	Ga	Ga	Y	0.924	0.449	Ca	Ba	Si	Sn	Al	Al	Sc	Y	2.082	0.794	Mg	Sr	Zr	HF	Ga	In	In	Sc	2.522	0.985	Mg	Ca	Si	Ti	Ga	Ga	Sc	Y	2.924	0.857	
Ca	Sr	Ge	Sn	Al	Ga	In	Sc	0.924	0.478	Be	Ca	Sn	Zr	Al	Al	In	Sc	2.082	0.644	Ca	Zn	Zr	HF	In	In	In	Sc	2.522	0.846	Mg	Ba	Si	Ti	Al	Ga	Sc	Sc	2.924	0.705	
Be	Ba	Ge	Sn	Ga	In	Y	Y	0.926	0.596	Ca	Ca	Ge	HF	Al	Ga	In	Sc	2.083	0.457	Mg	Ba	Si	Zr	Al	Ga	Ga	Sc	2.523	0.887	Be	Mg	Ba	Cd	Ti	Zr	Zr	HF	2.924	0.767	
Ca	Zn	Ge	Sn	Ga	In	In	Y	0.926	0.489	Mg	Sr	Sn	Ti	Al	Ga	Ga	Sc	2.083	0.362	Be	Sr	Sn	Ti	Al	Sc	Y	Y	2.523	0.901	Be	Ca	Ba	Zn	Ge	Ge	Sn	HF	2.924	0.836	
Sr	Ba	Sn	Sn	Al	In	Sc	Y	0.931	0.475	Ca	Cd	Sn	Zr	Al	Ga	Sc	Sc	2.083	0.393	Mg	Sr	Sn	Ti	Ga	Sc	Y	Y	2.523	0.771	Be	Mg	Sn	Zr	In	Sc	Sc	Y	2.924	0.700	
Ca	Cd	Ge	Sn	Ga	Ga	In	Y	0.931	0.494	Mg	Cd	Ge	HF	Ga	Ga	In	Y	2.083	0.513	Mg	Mg	Ge	Zr	Al	Ga	In	Y	2.523	0.867	Be	Be	Ba	Zn	Si	Sn	Ti	HF	2.925	0.726	
Sr	Sr	Ge	Sn	Al	Ga	In	Y	0.937	0.593	Be	Ca	Sn	Ti	Al	Ga	In	In	2.084	0.437	Ca	Ba	Ti	HF	Al	Al	In	Y	2.523	0.895	Mg	Cd	Zr	Zr	Al	Ga	In	Sc	2.925	0.806	
Ca	Ba	Sn	Sn	Al	Ga	In	Sc	0.937	0.603	Mg	Ca	Si	Sn	Al	Al	In	Sc	2.084	0.665	Zn	Cd	Ge	Ti	Ga	In	Sc	Sc	2.523	0.927	Mg	Ca	Si	Zr	Al	Al	Ga	In	2.925	0.843	
Be	Sr	Ge	Sn	Ga	Ga	In	Y	0.939	0.084	Be	Ca	Sn	Ti	Ga	In	In	Sc	2.084	0.920	Be	Mg	Ge	Sn	Al	Al	Ga	In	2.523	1.317	Ca	Sr	Si	Zr	Ga	Sc	Sc	Y	2.925	0.963	
Ca	Ba	Ge	Sn	Al	Ga	In	In	0.939	0.076	Zn	Cd	Ge	Ti	Ga	In	In	Y	2.084	0.776	Ca	Cd	Sn	Ti	In	Sc	Sc	Y	2.523	1.337	Be	Sr	Ti	Zr	Al	Ga	Ga	Sc	2.925	0.947	
Sr	Ba	Ge	Sn	Al	Ga	Ga	In	0.941	0.076	Ca	Sr	Si	Ti	Ga	In	In	Y	2.084	0.654	Ca	Ba	Zr	HF	Al	Ga	Ga	Y	2.523	1.218	Ba	Cd	Si	Ti	Zr	Al	Sc	Y	2.925	0.961	
Be	Ba	Ge	Sn	Al	Ga	Ga	In	0.942	0.043	Ba	Zn	Si	Zr	Ga	Ga	Sc	Y	2.084	0.404	Zn	Zn	Sn	Ti	Al	Ga	Sc	Y	2.524	0.643	Sr	Zn	Ti	HF	Al	Sc	Sc	Y	2.925	0.865	
Sr	Zn	Sn	Sn	Al	Ga	In	Sc	0.944	0.036	Be	Ba	Sn	HF	Ga	Ga	Sc	Y	2.084	0.524	Ca	Zn	HF	HF	Al	Ga	In	Y	2.524	1.125	Mg	Sr	Ba	Zn	Sn	Sn	Ti	HF	2.925	0.874	
Sr	Ba	Ge	Sn	In	In	Sc	Y	0.945	0.082	Sr	Ba	Zn	Cd	Si	Ge	Ge	Zr	2.084	0.413	Ca	Ba	Ba	Cd	Si	Ge	Sn	Ti	2.524	1.010	Ca	Sr	Si	Ti	Al	Ga	Sc	Sc	2.925	0.891	
Sr	Ba	Ge	Sn	Al	Ga	In	In	0.945	0.349	Ba	Cd	Si	Zr	Al	Ga	In	Sc	2.084	0.624	Be	Ca	Ba	Ti	Zr	In	In	Sc	Y	2.524	0.560	Mg	Ca	Ba	Zn	Si	Sn	Sn	Ti	2.925	0.807
Ca	Cd	Sn	Sn	Al	Ga	In	Sc	0.946	0.343	Ca	Zn	Cd	Cd	Si	Ge	Sn	Zr	2.085	0.593	Mg	Sr	Ti	Zr	Al	In	Y	Y	2.524	1.145	Ca	Sr	Cn	Zn	Si	Sn	Zr	HF	2.925	0.855	
Ba	Zn	Sn	Sn	Al	In	Sc	Y	0.948	0.394	Mg	Ba	Cd	Ge	Ti	Ga	Ga	In	Sc	2.085	0.489	Ca	Ba	Zn	Cd	Si	Ti	HF	HF	2.524	1.033	Be	Cd	Si	Zr	Ga	Ga	Sc	Y	2.925	0.870
Ba	Ba	Ge	Sn	Al	Ga	In	Y	0.949	0.320	Be	Ca	Ge	Ti	Ga	In	In	Y	2.085	0.518	Be	Mg	Zn	Cd	Si	Sn	Sn	HF	2.524	0.797	Mg	Ca	Sr	Cd	Si	Ge	Ge	Zr	2.926	0.957	
Ca	Ba	Ge	Sn	Al	Ga	Ga	Y	0.951	0.418	Ca	Ba	Zn	Cd	Ge	Ge	Zr	HF	2.085	0.753	Mg	Sr	Ba	Cd	Si	Ge	HF	HF	2.524	1.241	Ca	Cd	Ti	HF	Ga	Sc	Y	Y	2.926	0.985	
Ca	Ba	Si	Sn	Ga	In	In	Y	0.951	0.412	Sr	Cd	Zr	HF	Al	In	In	Y	2.085	0.536	Sr	Cd	Zr	HF	Ga	In	Sc	Sc	2.525	0.966	Be	Ca	Ti	HF	Al	Ga	Ga	In	2.926	0.887	
Sr	Cd	Si	Sn	Al	Ga	In	In	0.952	0.453	Ca	Ba	Zn	Zr	Al	Ga	Ga	Sc	2.085	0.754	Ba	Cd	Ge	Ti	Ga	Sc	Sc	Y	2.525	0.728	Ba	Cd	Ti	Zr	Al	Sc	Sc	Y	2.926	0.908	
Zn	Cd	Sn	Sn	Al	Ga	In	Y	0.953	0.365	Ba	Zn	Zr	HF	Ga	In	In	Y	2.085	0.838	Be	Ba	Ti	HF	Ga	Sc	Sc	Y	2.525	1.279	Be	Cd	Ti	HF	Ga	Sc	Sc	Y	2.926	0.982	
Mg	Ba	Ge	Sn	Ga	Ga	In	Sc	0.954	0.408	Be	Cd	Sn	HF	Al	Ga	Y	Y	2.085	0.609	Mg	Ca	Cd	Cd	Si	Ge	Sn	Ti	2.525	0.987	Be	Cd	Ti	HF	Ga	In	Sc	Sc	2.926	0.864	
Ba	Cd	Sn	Sn	Al	Ga	Sc	Y	0.956	-0.262	Mg	Ba	Zn	Zr	Al	Al	In	Y	2.085	0.553	Ba	Cd	Ti	HF	Al	Al	Ga	Sc	2.525	0.507	Be	Be	Ge	HF	Al	In	Sc	Y	2.926	0.901	
Be	Sr	Si	Sn	Ga	In	In	Y	0.956	-0.284	Ba	Cd	Ti	HF	Al	In	Y	Y	2.085	0.452	Ca	Ba	Zn	Zn	Si	Ge	Sn	Ti	2.525	0.648	Be	Zn	Zr	Zr	Ga	In	Sc	Y	2.926	0.954	
Ca	Ba	Ge	Sn	Al	Ga	Ga	In	0.957	-0.286	Mg	Ca	Ge	Ti	Al	In	In	Y	2.085	0.398	Zn	Cd	Sn	Ti	Al	Ga	Sc	Sc	2.525	0.556	Be	Ca	Si	Ti	In	Sc	Y	Y	2.926	0.852	
Ca	Sr	Ge	Sn	In	In	Sc	Y	0.959	-0.343	Sr	Zn	Cd	Cd	Ge	Sn	Zr	HF	2.086	0.670	Ca	Cd	Ge	HF	In	Sc	Sc	Y	2.525	0.896	Sr	Sr	Ba	Zn	Ge	Sn	Ti	HF	2.926	0.877	
Ba	Cd	Si	Sn	Ga	In	In	Sc	0.960	-0.351	Sr	Zn	Si	HF	Al	Al	In	Y	2.086	0.898	Be	Be	Sr	Cd	Si	Ge	Sn	Ti	2.525	1.314	Mg	Ba	Zn	Cd	Ge	Ti	Ti	Zr	2.926	0.748	
Sr	Cd	Si	Sn	Al	In	In	Y	0.962	-0.302	Be	Zn	Si	Sn	Al	In	Y	Y	2.086	0.775	Be	Ca	Sn	Ti	In	Sc	Sc	Y	2.525	1.135	Sr	Ba	Si	Ti	Ga	Sc	Sc	Y	2.926	0.87	
Mg	Sr	Sn	Sn	Al	In	Sc	Y	0.966	-0.041	Zn	Cd	Sn	HF	Ga	Ga	Sc	Y	2.086	0.891	Be	Ca	Sn	Zr	Al	Ga	Sc	Sc	2.525	0.829	Mg	Cd	Sn	Ti	Ga	Sc	Sc	Y	2.927	0.835	
Be	Sr	Ge	Sn	Al	Ga	In	In	0.970	-0.049	Ba	Zn	Sn	HF	In	Sc	Sc	Y	2.087	0.977	Zn	Cd	Sn	Zr	Al	Sc	Y	Y	2.526	1.351	Be	Sr	Ba	Zn	Si	Ge	Zr	Zr	2.927	0.874	
Be	Ba	Ge	Sn	Ga	Ga	In	Sc	0.972	0.007	Mg	Zn	Ge	Ge	Ga	In	Sc	Y	2.087	0.836	Be	Ca	Si	Ge	Al	In	Sc	Sc	2.526	1.154	Be	Ca	Ba	Cd	Si	Si	Ge	Zr	2.927	0.724	
Sr	Ba	Si	Sn	Ga	In	In	Y	0.972	-0.045	Be	Ba	Si	HF	Ga	In	In	Sc	2.087	0.717	Sr	Ba	Ba	Cd	Si	Ge	Ti	Zr	2.526	0.647	Ca	Zn	Zr	HF	Al	In	Sc	Sc	2.927	0.857	
Ca	Cd	Sn	Sn	Ga	In	Sc	Y	0.975	0.013	Be	Cd	Sn	HF	Ga	In	In	Sc	2.087	0.624	Be	Zn	Sn	Zr	Zr	Al	Ga	Ga	In	2.526	0.785	Mg	Ca	Si	HF	In	Sc	Sc	Y	2.927	0.902
Be	Sr	Sn	Sn	Al	Ga	In	Sc	0.975	0.005	Sr	Cd	Ge	Ti	Al	In	Sc	Sc	2.087	0.628	Be	Sr	Sr	Cd	Si	Sn	Ti	Zr	2.526	0.751	Ca	Zn	Si	Ge	Al	Sc	Sc	Y	2.927	0.727	
Sr	Zn	Ge	Sn	In	In	Sc	Y	0.978	0.053	Sr	Ba	Si	HF	Al	Ga	Ga	Y	2.087	0.773	Mg	Ba	Ti	Ti	Al	In	Sc	Y	2.526	0.696	Be	Ca	Cn	Cd	Ge	Ti	Ti	HF	2.928	0.802	
Ca	Sr	Sn	Sn	Al	In	Sc	Y	0.979	-0.011	Be	Cd	Sn	Ti	Al	In	In	Y	2.088	0.700	Sr	Ba	HF	HF	Al	Ga	In	Sc	2.526	0.850	Be	Sr	Ti	Zr	Al	Ga	Sc	Sc	2.928	0.858	
Mg	Ba	Ge	Sn	Al	Ga	Ga	Y	0.981	0.000	Mg	Ca	Sn	HF	Ga	Ga	In	Sc	2.088	0.893	Be	Ca	Ba	Ti	Ga	Ga	In	Sc	2.526	1.049	Zn	Cd	Ti	Ti	Al	Ga	Sc	Y	2.928	0.855	
Ba	Cd	Ge	Sn	Al	Ga	In	Y	0.981	0.110	Mg	Ba	Si	Zr	In	In	Sc	Y	2.088	0.508	Mg	Ca	Ge	Zr	Al	Ga	Ga	Sc	2.526	1.445	Mg	Sr	Zn	Cd	Sn	Ti	Ti	HF	2.928	1.221	
Sr	Zn	Ge	Sn	Ga	In	Y	Y	0.983	0.098	Be	Ca	Ge	Zr	In	In	Sc	Y	2.088	0.364	Zn	Cd	Zr	HF	Al	Al	In	Y	2.526	1.466	Ca	Zn	Ti	Ti	Al	Ga	Sc	Y	2.928	1.089	
Ca	Zn	Sn	Sn	Al	Ga	In	Y	0.984	0.097	Mg	Ba	Ge	HF	Al	Ga	Ga	In	2.089	0.285	Be	Cd	Ge	Zr	Al	Al	Ga	In	2.526	1.366	Sr	Ba	Si	Zr	Al	Ga	Sc	Sc	Y	2.928	0.970
Ca	Sr	Si	Sn	Ga	In	In	Y	0.987	0.008	Ca	Cd	Si	Ge	Al	Ga	Ga	Sc	2.089	0.211	Mg	Ca	Si	Sn	Al	Ga	Sc	Y	2.527	0.844	Mg	Cd	Si	Ge	Al	Al	Sc	Y	2.928	0.768	
Mg	Ba	Si	Sn	Al	Ga	In	Y	0.987	0.000	Mg	Zn	Si	Ge	Ga	In	Y	Y	2.089	0.206	Be	Mg	Sn	Ti	Al	In	Y	Y	2.527	1.283	Be	Zn	Zr	HF	Al	Sc	Sc	Y	2.928	0.794	
Ba	Cd	Si	Sn	Ga	Ga	In	Y	0.988	0.087	Ba	Zn	Ti	HF	In	In	Sc	Y	2.089	0.137	Ca	Zn	Si	Si	Al	In	Sc	Y	2.527	1.188	Be	Be	Zn	Cd	Si	Sn	Ti	HF	2.928	0.873	
Sr	Zn	Ge	Sn	Al	In	In	Sc	0																																

Be	Ba	Ge	Sn	Al	Ga	Ga	Y	1.106	0.402	Sr	Cd	Ti	Hf	Ga	In	Y	Y	2.100	0.695	Be	Mg	Ge	Hf	In	In	Sc	Y	2.535	0.906	Ca	Ba	Si	Hf	Ga	Sc	Y	Y	2.939	0.684		
Sr	Cd	Ge	Sn	Al	Al	Ga	In	1.108	0.498	Be	Sr	Cd	Zr	Al	Al	Ga	Y	2.100	0.758	Mg	Ba	Ge	Hf	In	In	Sc	Y	2.536	0.994	Be	Mg	Ba	Cd	Si	Ti	Zr	Hf	2.939	0.930		
Ca	Zn	Ge	Sn	Ga	Ga	In	Y	1.109	0.727	Ba	Cd	Zr	Zr	Ga	In	In	Sc	2.100	1.050	Mg	Ba	Ge	Hf	Ga	In	Zr	Hf	2.536	0.937	Be	Mg	Ge	Hf	Ga	In	Sc	Sc	2.939	0.900		
Ca	Ba	Ge	Sn	Al	Ga	Ga	Sc	1.109	0.656	Mg	Sr	Cd	Ge	Hf	Al	Al	In	Y	2.100	0.910	Sr	Ba	Ti	Hf	Ga	Ga	Sc	Y	2.536	0.944	Mg	Cd	Zr	Hf	Ga	Ga	Sc	Y	2.939	0.805	
Mg	Ba	Sn	Sn	Al	Ga	Sc	Y	1.110	0.643	Mg	Cd	Sn	Ti	In	In	Sc	Y	2.100	0.771	Ba	Zn	Zr	Hf	Ga	In	In	Sc	Sc	2.536	0.903	Zn	Cd	Si	Zr	Ga	Sc	Y	Y	2.939	0.749	
Ba	Zn	Si	Sn	Ga	In	In	Sc	1.111	0.404	Mg	Ba	Si	Sn	Ga	In	In	Sc	Y	2.100	0.556	Mg	Ba	Zr	Hf	Ga	In	In	Sc	Sc	2.536	0.758	Be	Zn	Si	Zr	Al	In	In	Sc	2.939	0.724
Ba	Ba	Ge	Sn	Ga	In	Sc	Y	1.111	0.384	Sr	Ba	Sn	Hf	In	In	Sc	Y	2.100	0.664	Zn	Cd	Si	Zr	Al	Al	In	Y	2.536	0.920	Be	Ca	Ti	Hf	Al	In	In	Sc	2.939	0.758		
Ca	Ba	Si	Sn	Ga	In	In	Sc	1.113	0.339	Ca	Ba	Ge	Hf	Ga	Ga	Sc	Y	2.100	0.535	Be	Ba	Si	Hf	Al	Al	In	Sc	2.536	0.883	Be	Mg	Ca	Zn	Ge	Sn	Sn	Zr	2.939	0.698		
Ba	Zn	Si	Sn	Al	Ga	In	In	1.113	0.601	Ba	Ba	Si	Ge	Al	Ga	Sc	Y	2.100	0.777	Mg	Ca	Zr	Hf	Ga	In	Y	Y	2.536	0.765	Mg	Sr	Zn	Cd	Sn	Ti	Ti	Zr	2.940	0.851		
Ba	Cd	Si	Sn	Ga	In	Y	Y	1.113	0.582	Ba	Cd	Si	Hf	Al	Al	Ga	Y	2.101	0.739	Mg	Ca	Sn	Hf	Ga	Sc	Y	Y	2.536	0.987	Be	Sr	Zr	Hf	Al	Ga	Ga	Sc	2.940	0.861		
Be	Ba	Si	Sn	Al	Ga	In	In	1.113	0.540	Mg	Cd	Sn	Ti	Al	In	In	Sc	2.101	0.616	Zn	Cd	Ti	Ti	Al	Ga	In	Y	2.536	0.951	Mg	Ca	Ba	Zn	Si	Sn	Zr	Zr	2.940	0.797		
Ba	Zn	Sn	Hf	Al	In	In	Y	1.115	0.612	Ba	Cd	Si	Zr	Al	Al	Ga	In	2.101	0.659	Mg	Cd	Si	Hf	Al	Ga	Ga	In	2.536	0.869	Mg	Ca	Ti	Zr	Ga	Ga	Sc	Y	2.940	0.753		
Ba	Cd	Sn	Zr	Ga	In	In	Y	1.115	0.612	Mg	Sr	Si	Ti	Zr	Ga	In	In	Y	2.101	0.879	Be	Zn	Zr	Hf	Ga	In	Y	Y	2.536	1.014	Mg	Ca	Si	Ge	Al	Sc	Sc	Y	2.940	0.873	
Sr	Cd	Si	Sn	Al	In	In	Sc	1.115	0.593	Ba	Zn	Ti	Zr	Ga	In	Y	Y	2.101	0.654	Ca	Cd	Si	Ge	Al	Al	Sc	Y	2.536	0.851	Ca	Ba	Ba	Zn	Si	Ge	Sn	Ti	2.940	0.772		
Zn	Cd	Sn	Sn	Al	Ga	In	Sc	1.116	0.544	Zn	Cd	Ge	Hf	Ga	Ga	In	Sc	2.101	0.896	Ca	Cd	Si	Hf	Al	Sc	Sc	Y	2.536	0.889	Mg	Sr	Zn	Cd	Ge	Zr	Hf	Hf	2.940	0.892		
Zn	Cd	Si	Sn	Al	Ga	In	In	1.116	0.601	Zn	Zn	Sn	Ti	Al	Ga	In	Y	2.101	0.970	Be	Ba	Si	Hf	Al	Al	Ga	Y	2.537	1.100	Mg	Sr	Zn	Cd	Si	Si	Ge	Hf	2.940	0.993		
Mg	Ba	Si	Sn	Ga	Ga	In	Y	1.117	0.579	Cd	Cd	Si	Hf	Al	Ga	In	Y	2.101	0.732	Sr	Cd	Si	Ge	Al	Sc	Y	Y	2.537	0.917	Sr	Ba	Ba	Zn	Si	Ge	Ti	Hf	2.940	0.869		
Be	Sr	Si	Sn	Ga	In	In	Sc	1.117	0.872	Be	Sr	Si	Ge	In	Sc	Y	Y	2.102	0.645	Be	Mg	Ge	Zr	Ga	In	In	Y	2.537	0.791	Mg	Mg	Si	Hf	Al	In	In	Sc	Y	2.940	0.691	
Sr	Cd	Sn	Hf	Al	Ga	In	Y	1.118	0.817	Mg	Zn	Sn	Ti	Ga	In	In	Y	2.102	0.549	Be	Ca	Si	Si	Ga	In	Sc	Y	2.537	0.878	Ca	Cd	Ti	Zr	Al	Al	Ga	Sc	Y	2.940	0.682	
Be	Ca	Sn	Sn	Ga	In	In	Sc	1.121	0.806	Mg	Ba	Ge	Hf	Ga	Ga	Sc	Y	2.102	0.536	Mg	Mg	Sn	Hf	Al	Ga	Sc	Y	2.537	0.791	Mg	Ca	Ba	Cd	Si	Ge	Ti	2.941	0.767			
Ca	Cd	Si	Sn	Al	Ga	In	In	1.123	0.791	Ca	Ba	Si	Hf	Ga	In	Y	Y	2.102	0.804	Mg	Ca	Cd	Cd	Si	Sn	Ti	Zr	2.537	0.846	Ca	Cd	Ti	Zr	Al	Al	Ga	Sc	2.941	0.762		
Ba	Cd	Ge	Sn	Al	Ga	Y	Y	1.126	0.772	Ca	Ba	Ge	Ti	Ga	Ga	In	Sc	2.102	1.017	Sr	Sr	Ti	Zr	Al	Ga	In	Sc	2.537	0.972	Sr	Ba	Ti	Ti	In	Sc	Y	Y	2.941	0.873		
Sr	Ba	Sn	Sn	Al	Ga	Sc	Y	1.127	0.760	Be	Cd	Sn	Zr	In	In	Sc	Y	2.103	0.905	Zn	Cd	Hf	Hf	Ga	In	Sc	Y	2.537	0.826	Be	Ba	Zn	Cd	Si	Ge	Ge	Ti	2.941	0.816		
Sr	Ba	Si	Sn	Ga	In	In	Sc	1.127	0.940	Sr	Ba	Si	Si	Al	Ga	In	Y	2.103	1.025	Be	Cd	Ba	Cd	Ge	Ge	Sn	Zr	2.537	0.865	Be	Ca	Ti	Hf	Ga	Ga	In	Sc	2.941	0.891		
Zn	Cd	Ge	Sn	Ga	Ga	In	Y	1.127	0.922	Mg	Ca	Si	Ge	Al	Ga	Ga	In	2.103	1.102	Sr	Ba	Zr	Hf	Al	Cd	In	Sc	2.537	1.055	Be	Ba	Zn	Cd	Ge	Sn	Ti	Zr	2.941	0.982		
Ba	Cd	Sn	Hf	Ga	In	In	Y	1.129	0.909	Ca	Cd	Sn	Hf	Al	Al	Sc	Y	2.103	0.971	Mg	Sr	Zn	Cd	Si	Ge	Hf	Hf	2.537	0.889	Mg	Cd	Si	Ge	Al	Sc	Y	Y	2.942	0.905		
Zn	Cd	Ge	Sn	Al	Ga	Ga	In	1.130	0.772	Ba	Cd	Si	Hf	Al	In	In	Sc	2.103	0.801	Mg	Ca	Sr	Cd	Si	Sn	Hf	Hf	2.537	0.802	Be	Mg	Ge	Hf	Ga	Sc	Y	Y	2.942	0.703		
Be	Ba	Si	Sn	Ga	Ga	In	Y	1.131	1.076	Sr	Cd	Si	Hf	Ga	Ga	Sc	Y	2.104	0.712	Be	Mg	Ge	Hf	Al	In	In	Y	2.538	0.887	Be	Zn	Ge	Hf	Al	Sc	Y	Y	2.942	0.695		
Sr	Cd	Ge	Ge	Al	Ga	In	Y	1.131	1.059	Ba	Cd	Sn	Hf	Ga	Ga	Sc	Y	2.104	0.779	Sr	Cd	Si	Zr	Al	Al	In	Sc	Y	2.538	0.773	Be	Mg	Sr	Cd	Si	Sn	Ti	Ti	2.942	0.801	
Mg	Ba	Ge	Sn	Al	Al	Ga	In	1.131	1.036	Ba	Ba	Zn	Cd	Ge	Sn	Ti	Zr	2.104	0.857	Cd	Cd	Ti	Zr	Al	In	Sc	Y	2.538	0.830	Be	Cd	Ti	Hf	In	In	Sc	Y	2.942	0.743		
Ca	Ca	Ge	Sn	Al	Ga	In	Y	1.131	0.885	Ca	Ba	Ba	Zn	Cd	Si	Ge	Zr	2.104	0.788	Be	Ca	Sn	Ti	Zr	Al	Al	In	Sc	2.538	0.931	Mg	Sr	Zn	Zn	Si	Ge	Sn	Ti	2.942	0.750	
Ca	Zn	Ge	Sn	Ga	In	In	Sc	1.132	0.984	Ba	Cd	Ti	Zr	Al	In	In	Sc	2.104	1.032	Be	Ca	Ti	Hf	Ga	In	In	Y	2.538	1.013	Be	Sr	Zn	Cd	Si	Ge	Ge	Hf	2.942	0.963		
Be	Ba	Sn	Sn	Al	Ga	Sc	Y	1.134	0.428	Be	Ba	Sn	Hf	Ga	Sc	Sc	Y	2.105	0.615	Sr	Ba	Ti	Zr	Al	Al	Ga	Sc	2.538	1.604	Be	Mg	Ba	Zn	Zn	Si	Si	Sn	Hf	2.942	0.908	
Sr	Cd	Si	Sn	In	In	Sc	Y	1.138	0.378	Zn	Cd	Ge	Ti	Al	Ga	Ga	In	2.105	0.476	Mg	Mg	Cd	Zr	Ti	Ga	In	Sc	Y	2.538	1.630	Ca	Zn	Ge	Ti	Ga	Sc	Sc	Y	2.943	0.816	
Sr	Zn	Ge	Sn	Al	In	Y	Y	1.140	0.368	Mg	Ba	Ge	Ge	Hf	Ga	In	Y	2.105	0.380	Be	Cd	Zr	Hf	Ga	In	In	Y	2.538	1.510	Mg	Cd	Zr	Hf	Ga	Sc	Y	Y	2.943	0.763		
Sr	Cd	Sn	Hf	Ga	In	In	Y	1.140	0.392	Ca	Sr	Si	Ti	Al	In	In	Sc	2.105	0.338	Ca	Sr	Zr	Hf	Ga	Ga	In	Y	2.538	1.015	Be	Mg	Ti	Hf	Ga	In	In	Y	2.943	0.746		
Mg	Ba	Si	Sn	Al	Ga	Ga	In	1.142	0.374	Ca	Zn	Si	Hf	Al	Ga	In	In	2.105	0.322	Mg	Sr	Hf	Hf	Al	In	Sc	Y	2.538	1.452	Mg	Mg	Ba	Zn	Si	Ge	Sn	Hf	2.943	0.776		
Ca	Zn	Sn	Sn	Ga	In	Sc	Y	1.143	0.388	Be	Ba	Sn	Hf	Al	Al	Sc	Y	2.105	0.235	Ca	Sr	Ti	Zr	Al	Ga	Ga	Y	2.538	1.335	Mg	Ca	Ba	Cd	Ge	Ti	Ti	Hf	2.944	0.719		
Mg	Cd	Sn	Sn	Al	Ga	In	Y	1.144	0.550	Ba	Cd	Zr	Hf	Ga	In	Y	Y	2.106	0.600	Be	Ba	Ba	Zn	Cd	Ge	Ge	Sn	Hf	2.538	0.926	Ca	Cd	Si	Hf	Ga	Sc	Sc	Y	2.944	0.870	
Mg	Ba	Ge	Sn	Ga	In	Sc	Sc	1.144	0.533	Mg	Sr	Ge	Ti	Ga	In	Y	Y	2.106	0.426	Ca	Cd	Si	Zr	Al	In	Sc	Sc	2.538	1.478	Mg	Zn	Sn	Ti	In	Ga	Sc	Sc	2.944	0.879		
Mg	Ba	Ge	Sn	Al	Ga	Ga	Sc	1.145	0.545	Sr	Cd	Si	Ti	Ga	Ga	In	Sc	2.106	0.345	Be	Ca	Sn	Zr	Ga	Ga	Sc	Y	2.538	1.362	Zn	Cd	Ti	Zr	Al	In	Sc	Sc	Y	2.944	0.819	
Ca	Ba	Sn	Sn	Al	Ga	Sc	Y	1.146	0.422	Mg	Sr	Sn	Ti	Al	Al	Ga	Y	2.106	0.413	Sr	Zn	Ge	Zr	Ga	Sc	Sc	Y	2.539	1.152	Be	Ca	Si	Hf	Al	Al	In	Sc	2.944	0.772		
Ba	Cd	Si	Sn	Ga	Ga	In	Sc	1.146	0.680	Mg	Ba	Si	Ti	Al	In	In	Y	2.106	0.511	Mg	Zn	Ge	Sn	Al	Sc	Y	Y	2.539	1.545	Be	Zn	Zr	Hf	Ga	In	In	Sc	2.944	0.887		
Mg	Ba	Si	Sn	Al	In	In	Sc	1.147	0.663	Ba	Cd	Si	Zr	Ga	Ga	In	Sc	2.106	0.352	Zn	Cd	Si	Si	Al	Ga	In	Sc	2.539	1.283	Zn	Cd	Si	Hf	Al	Al	Sc	Y	2.944	0.791		
Zn	Cd	Sn	Sn	Al	Ga	In	Sc	1.148	0.664	Ba	Ba	Zn	Cd	Si	Sn	Ti	Zr	2.106	0.690	Be	Cd	Sn	Hf	Ga	Ga	Sc	Y	2.539	1.077	Ca	Sr	Ba	Zn	Sn	Sn	Ti	Hf	2.945	0.908		
Ba	Cd	Sn																																							

Ba	Cd	Ge	Sn	Al	In	Sc	Sc	1.214	0.147	Be	Ca	Sn	Hf	Al	Ga	Y	Y	2.122	0.378	Be	Ca	Ge	Ti	Al	Ga	Ga	In	2.546	0.988	Sr	Ba	Ge	Ti	Al	Sc	Y	Y	2.957	0.812	
Ba	Cd	Si	Ge	Al	Ga	In	In	1.215	0.439	Ca	Zn	Ge	Sn	Ga	Sc	Sc	Y	2.122	0.772	Mg	Sr	Ba	Cd	Si	Ge	Zr	Zr	2.546	0.887	Sr	Cd	Ti	Hf	Al	Sc	Sc	Y	2.957	0.960	
Sr	Zn	Sn	Hf	Al	In	In	Y	1.215	0.426	Sr	Cd	Sn	Ti	Al	Al	Sc	Y	2.122	0.572	Mg	Ca	Ti	Zr	Ga	In	Y	2.546	1.120	Be	Sr	Zn	Cd	Si	Ge	Sc	Y	2.957	0.999		
Sr	Cd	Si	Sn	Ga	Ga	In	Sc	1.216	0.411	Ba	Zn	Cd	Cd	Si	Ge	Zr	Hf	2.122	0.479	Mg	Cd	Ge	Hf	Al	In	Sc	Sc	2.546	1.061	Mg	Cd	Si	Zr	Al	In	Sc	Sc	2.957	0.918	
Be	Ca	Ge	Sn	In	In	Sc	Y	1.217	0.272	Ba	Zn	Cd	Ti	Al	Al	Ga	Sc	2.122	0.574	Be	Sr	Sr	Cd	Si	Ge	Sn	Ti	2.546	0.984	Be	Zn	Ge	Zr	Al	In	Sc	Sc	2.957	0.860	
Be	Cd	Ge	Sn	Al	Ga	In	In	1.217	0.562	Be	Cd	Si	Sn	Al	Al	In	Y	2.123	0.655	Ca	Ba	Zr	Hf	Al	Ga	Ga	In	2.546	1.123	Be	Zn	Ba	Cd	Si	Ti	Zr	Sc	2.957	0.988	
Ba	Cd	Ge	Ge	Al	Ga	In	Sc	1.217	0.549	Ba	Zn	Zn	Cd	Ge	Sn	Ti	Zr	2.123	0.500	Sr	Cd	Zr	Hf	Al	Al	Ga	Y	2.546	0.948	Mg	Mg	Ge	Ti	Al	Al	In	Sc	2.957	0.877	
Ba	Ba	Sn	Al	In	Sc	Y	1.218	0.529	Ca	Sr	Si	Ge	Al	Al	In	Sc	2.123	0.846	Ca	Sr	Ti	Zr	Al	In	Y	Y	2.547	0.999	Be	Ca	Sr	Cd	Si	Ti	Ti	Hf	2.957	0.991		
Sr	Ba	Si	Sn	Ga	Ga	Y	1.219	0.380	Ca	Sr	Ge	Hf	Ga	Ga	Sc	Y	2.123	0.766	Be	Ca	Si	Hf	Ga	Ga	In	Y	2.547	1.215	Mg	Cd	Si	Ti	Al	Ga	Ga	Y	2.957	1.114		
Sr	Sr	Ge	Sn	Al	In	Sc	Y	1.219	0.439	Ba	Zn	Si	Hf	Al	Ga	Ga	Sc	2.123	0.597	Zn	Cd	Sn	Ti	Al	Al	Ga	Sc	2.547	1.020	Mg	Sr	Zr	Hf	Al	Al	Ga	Sc	2.957	0.980	
Ba	Zn	Sn	Hf	Ga	Ga	In	Y	1.221	0.713	Ba	Cd	Ti	Ti	Al	Ga	In	Y	2.123	0.623	Be	Sr	Si	Hf	Al	In	Sc	Sc	2.547	0.843	Zn	Cd	Ti	Zr	Al	Sc	Y	Y	2.958	0.743	
Ba	Cd	Sn	Hf	Ga	In	In	Sc	1.221	0.652	Ca	Ba	Ge	Zr	Al	Al	Ga	In	2.123	0.505	Mg	Ba	Si	Ge	Al	Sc	Sc	Y	2.547	0.939	Be	Ca	Sr	Cd	Si	Zr	Hf	Sc	2.958	0.748	
Be	Sr	Si	Sn	Al	Ga	In	In	1.222	0.642	Ca	Ba	Ge	Hf	Al	Al	In	Sc	2.123	0.544	Ca	Cd	Sn	Zr	Al	Sc	Y	Y	2.547	0.900	Mg	Cd	Zr	Hf	Al	Al	In	Sc	2.958	0.871	
Ca	Sr	Ge	Sn	Ga	In	Y	Y	1.223	0.450	Sr	Cd	Si	Hf	Al	Al	Ga	In	2.123	0.634	Be	Cd	Si	Ge	Ga	Sc	Y	Y	2.547	0.952	Be	Mg	Sr	Cd	Si	Ge	Hf	Hf	2.958	0.868	
Be	Ba	Ge	Sn	Ga	Ga	Sc	Y	1.224	0.434	Mg	Sr	Ge	Zr	Al	In	Y	Y	2.123	0.712	Sr	Zn	Zr	Zr	Al	Ga	In	Sc	2.548	1.072	Mg	Ba	Ti	Al	Sc	Sc	Sc	Y	2.958	0.986	
Mg	Ca	Ge	Sn	Al	Ga	Ga	In	1.224	0.432	Mg	Cd	Sn	Zr	Ga	Ga	In	Sc	2.124	0.638	Ca	Sr	Zr	Zr	Al	In	Sc	Y	2.548	0.938	Mg	Mg	Zn	Cd	Ge	Sn	Ti	Hf	2.958	0.938	
Ba	Zn	Ge	Sn	Ga	In	Sc	Sc	1.225	0.707	Be	Sr	Si	Zr	In	In	Sc	Y	2.124	0.890	Be	Ba	Ti	Hf	Al	Al	Ga	In	2.548	0.966	Be	Zn	Zr	Hf	Al	Al	In	Y	2.958	0.988	
Mg	Sr	Si	Sn	Al	Ga	Ga	In	1.227	0.693	Ca	Cd	Si	Zr	Al	In	In	Sc	2.124	0.815	Zn	Cd	Zr	Hf	Al	Al	Ga	In	2.548	1.161	Ca	Zn	Ti	Zr	Al	Ga	Ga	Sc	2.958	1.102	
Sr	Ba	Si	Sn	In	In	Al	Sc	1.227	0.702	Ca	Ba	Ge	Zr	Al	In	Y	Y	2.124	0.721	Be	Ca	Sn	Ti	Al	Al	Ga	Y	2.548	1.006	Mg	Sr	Si	Zr	Al	Al	Sc	Y	2.958	1.033	
Mg	Ba	Ge	Sn	Al	Al	Ga	Y	1.228	0.684	Ca	Ba	Ge	Hf	Al	Al	Ga	Sc	2.124	0.692	Ca	Zn	Ti	Zr	Ga	In	In	Sc	2.548	0.845	Be	Cd	Ti	Hf	Al	Al	In	Sc	2.958	0.753	
Sr	Zn	Sn	Hf	Ga	In	In	Y	1.229	0.704	Ca	Cd	Si	Si	Al	Ga	In	Y	2.125	0.581	Be	Ba	Zr	Hf	Al	In	In	Sc	Sc	2.548	0.939	Sr	Ba	Ti	Hf	Al	Sc	Y	Y	2.958	0.758
Ca	Zn	Ge	Sn	Al	In	In	Sc	1.230	0.690	Mg	Sr	Ge	Ti	Al	Ga	Ga	In	2.125	0.664	Be	Ba	Zn	Cd	Ge	Ge	Sn	Zr	2.548	0.896	Be	Ba	Zn	Zn	Si	Sn	Ti	Zr	2.959	0.922	
Sr	Cd	Sn	Zr	Al	Ga	In	In	1.231	0.697	Sr	Zn	Ge	Zr	Al	Ga	Sc	Sc	2.125	0.722	Mg	Cd	Sn	Ti	Al	In	Sc	Sc	2.548	0.872	Ca	Ba	Si	Ti	In	Sc	Y	Y	2.959	0.796	
Ca	Sr	Ge	Sn	Al	Al	In	Y	1.235	0.670	Be	Mg	Sn	Sn	Al	Ga	In	Sc	2.125	0.632	Mg	Cd	Si	Zr	Al	Al	Ga	Y	2.548	0.982	Mg	Zn	Sn	Ti	Al	Al	Sc	Y	2.959	0.817	
Be	Sr	Ge	Sn	Ga	In	Sc	Sc	1.235	0.618	Mg	Ba	Ge	Zr	Al	Ga	Ga	Sc	2.125	0.851	Be	Ca	Zr	Hf	Al	In	Y	Y	2.548	1.123	Mg	Cd	Ge	Hf	Ga	Sc	Sc	Y	2.960	1.078	
Mg	Ba	Si	Sn	Al	Ga	Ga	In	1.237	0.900	Ca	Sr	Sn	Ti	Al	Al	Ga	Sc	2.125	0.767	Be	Mg	Sn	Hf	Ga	In	In	Sc	2.548	1.278	Mg	Ca	Ba	Cd	Si	Ti	Ti	Zr	2.960	1.029	
Ca	Cd	Ge	Sn	Al	In	Y	Y	1.237	0.855	Sr	Sr	Si	Ge	Al	Ga	Sc	Y	2.125	0.632	Mg	Sr	Ba	Cd	Ge	Ge	Zr	Hf	2.548	1.288	Be	Ca	Ba	Cd	Si	Si	Ti	Zr	2.960	0.945	
Ba	Cd	Sn	Hf	In	In	Sc	Y	1.237	0.845	Mg	Ca	Sn	Zr	Al	Al	In	Y	2.126	0.560	Zn	Zn	Ge	Ti	Al	Ga	In	Sc	2.549	1.181	Sr	Zn	Si	Zr	Al	Sc	Sc	Y	2.960	0.876	
Sr	Cd	Sn	Hf	Ga	Ga	In	Y	1.238	0.883	Be	Cd	Sn	Zr	Ga	Ga	In	Y	2.126	0.651	Zn	Cd	Si	Zr	Al	Ga	Y	Y	2.549	0.942	Mg	Mg	Ca	Cd	Si	Sn	Zr	Hf	2.960	0.861	
Ca	Cd	Ge	Sn	Al	Ga	Ga	Y	1.239	0.865	Be	Ca	Si	Sn	Zr	Ga	Sc	Y	2.126	0.540	Mg	Cd	Si	Sn	Al	Al	Sc	Y	2.549	1.192	Ca	Zn	Si	Zr	Ga	Sc	Y	Y	2.960	0.906	
Mg	Sr	Ge	Sn	Al	Ga	Ga	In	1.241	0.873	Ca	Ba	Si	Zr	In	In	Sc	Y	2.126	0.479	Ca	Sr	Sr	Cd	Si	Sn	Ti	Zr	2.549	1.087	Mg	Ca	Si	Ge	Al	Sc	Y	Y	2.960	0.831	
Ca	Sr	Ge	Sn	Al	Al	Ga	In	1.241	1.023	Be	Zn	Sn	Zr	Ga	In	Y	Y	2.126	0.906	Be	Sr	Zr	Hf	Ga	In	In	Sc	Sc	2.549	0.914	Be	Zn	Si	Ti	Ga	In	In	Sc	2.960	0.976
Cd	Cd	Ge	Sn	Al	Ga	In	Sc	Y	1.241	1.007	Sr	Cd	Sn	Hf	In	Sc	Sc	Y	2.126	0.641	Be	Sr	Zr	Hf	Al	In	In	Sc	2.549	1.242	Mg	Sr	Zn	Cd	Si	Si	Ge	Zr	2.960	1.015
Ca	Ca	Ge	Sn	Ga	In	Sc	Y	1.242	1.013	Mg	Zn	Sn	Hf	In	In	Sc	Y	2.127	0.586	Mg	Zn	Ge	Zr	Al	Al	In	Y	2.549	1.138	Mg	Ca	Hf	Al	Ga	Ga	Sc	Y	2.960	0.937	
Mg	Ca	Sn	Sn	Al	In	Sc	Y	1.242	0.853	Ca	Cd	Si	Zr	Ga	In	Y	Y	2.127	0.688	Sr	Cd	Zr	Zr	Al	Ga	Sc	Y	2.549	1.046	Be	Zn	Si	Ti	Ga	Ga	In	Y	2.961	0.877	
Mg	Ca	Ge	Sn	Al	In	In	Sc	1.242	1.179	Sr	Ba	Si	Zr	Al	In	In	Sc	2.127	0.692	Be	Sr	Ti	Zr	Ga	Ga	In	Y	2.550	1.275	Mg	Ca	Ti	Hf	Al	In	Sc	Sc	2.961	0.999	
Mg	Ba	Ge	Sn	Ga	Ga	Sc	Y	1.243	1.163	Ca	Sr	Zn	Cd	Si	Ge	Hf	Hf	2.127	0.594	Sr	Zn	Si	Ti	Zr	Al	Al	Ga	Y	2.550	1.052	Mg	Ca	Sr	Zn	Ge	Sn	Sn	Zr	2.961	0.894
Sr	Zn	Ge	Sn	Al	Al	In	Y	1.244	1.158	Be	Mg	Si	Sn	In	In	Sc	Y	2.127	0.958	Be	Ba	Ti	Zr	Al	Al	Ga	Y	2.550	1.031	Mg	Mg	Zn	Cd	Si	Ge	Zr	Hf	2.961	1.004	
Ca	Cd	Si	Sn	Ga	Ga	In	Y	1.244	0.984	Mg	Cd	Sn	Ti	Al	Ga	Ga	In	2.127	0.808	Mg	Sr	Ge	Ti	Al	Al	Ga	Sc	2.550	1.343	Mg	Mg	Zn	Sn	Zr	Ga	Sc	Sc	Y	2.961	1.126
Ca	Sr	Si	Sn	Ga	Ga	In	Y	1.245	1.104	Be	Ba	Ge	Zr	Al	Al	Ga	In	2.127	0.696	Be	Ba	Zn	Cd	Si	Si	Ge	Sn	2.550	1.101	Mg	Sr	Si	Zr	Ga	Sc	Y	Y	2.961	0.997	
Sr	Ba	Ge	Sn	Ga	In	Y	Y	1.245	0.771	Sr	Ba	Sn	Ti	Al	Ga	Ga	Y	2.127	0.797	Sr	Ba	Zn	Cd	Si	Zr	Hf	Hf	2.550	0.780	Mg	Sr	Zn	Cd	Si	Ti	Zr	Zr	2.961	0.762	
Sr	Cd	Ge	Sn	Al	In	In	Sc	1.246	0.727	Ca	Sr	Si	Ti	Al	In	In	Y	2.128	0.681	Ba	Zn	Ti	Zr	Al	Ga	Ga	Sc	2.550	0.887	Ca	Sr	Zr	Hf	Al	Sc	Y	Y	2.961	0.770	
Mg	Ba	Ge	Sn	Al	In	Y	Y	1.246	0.718	Ca	Cd	Ge	Zr	Ga	In	Sc	Sc	2.128	0.722	Be	Sr	Sr	Cd	Si	Ge	Sn	Hf	2.550	0.889	Be	Mg	Sr	Cd	Ge	Sn	Ti	Ti	2.961	0.894	
Ca	Sr	Si	Sn	In	In	Sc	Sc	1.246	0.768	Mg	Cd	Ge	Hf	In	In	Sc	Y	2.128	0.716	Mg	Sr	Ba	Cd	Ge	Ge	Sn	Zr	2.550	1.045	Mg	Mg	Sr	Cd	Ge	Sn	Ti	Hf	2.961	0.881	
Mg	Sr	Ge	Sn	Al	In	Sc	Sc	1.248	0.750	Be	Zn	Sn	Hf	Al	In	Y	Y	2.128	0.720	Sr	Ba	Ge	Hf	Al	Al	Sc	Sc	Y	2.550	1.252	Mg	Ca	Ti	Zr	Al	Ga	Ga	Y	2.961	0.994
Be	Sr	Ge	Sn	Al	Ga	Ga	Y</																																	

Sr	Cd	Ge	Sn	Al	Al	Ga	Y	1.297	0.849	Mg	Cd	Si	Ge	Al	In	Y	Y	2.142	0.804	Zn	Cd	Ti	Hf	Al	Al	Ga	In	2.560	0.936	Sr	Ba	Si	Zr	Ga	Sc	Y	Y	2.973	1.101	
Sr	Cd	Ge	Hf	Ga	In	In	Y	1.297	0.667	Ca	Zn	Ge	Zr	Ga	Ga	Sc	Y	2.142	0.643	Be	Mg	Si	Sn	Ga	In	Sc	Sc	2.560	1.095	Be	Mg	Cd	Cd	Si	Sn	Ti	Zr	2.973	1.241	
Ca	Ba	Si	Sn	Al	Ga	Ga	Y	1.300	0.771	Ba	Cd	Ti	Zr	Al	In	Y	Y	2.142	0.575	Ca	Sr	Ge	Ti	Al	Ga	Sc	Sc	2.560	0.933	Mg	Ca	Sr	Zn	Ge	Sn	Hf	Hf	2.973	1.115	
Ca	Sr	Si	Sn	Al	Ga	In	In	1.300	0.642	Mg	Sr	Ge	Hf	Ga	In	Sc	Sc	2.142	0.755	Mg	Ba	Ge	Ti	In	Sc	Y	Y	2.561	0.851	Mg	Zn	Ti	Zr	Al	In	In	Sc	2.973	0.835	
Ba	Cd	Sn	Zr	In	In	Sc	Y	1.300	0.591	Cd	Cd	Sn	Ti	Al	Ga	Sc	Y	2.143	0.619	Ba	Cd	Ti	Zr	Al	Ga	Sc	Sc	2.561	0.903	Be	Ca	Ti	Zr	Al	Ga	Ga	In	2.973	0.850	
Ba	Zn	Sn	Hf	Ga	In	In	Y	1.301	0.583	Be	Cd	Sn	Zr	Ga	In	In	Sc	2.143	0.592	Mg	Ba	Zr	Hf	Al	Ga	Ga	In	2.561	0.823	Be	Ca	Zn	Cd	Si	Si	Sn	Hf	2.973	1.001	
Sr	Cd	Ge	Sn	Al	In	Sc	Y	1.301	0.568	Be	Cd	Sn	Ti	Al	In	Y	Y	2.143	0.573	Sr	Cd	Si	Hf	In	Sc	Y	Y	2.561	0.909	Mg	Sr	Ba	Zn	Ge	Sn	Hf	2.973	0.988		
Mg	Ca	Ge	Sn	Al	In	Y	Y	1.301	0.553	Be	Cd	Ge	Ti	Al	Ga	In	In	2.143	0.584	Be	Ba	Ge	Zr	Al	Sc	Y	Y	2.562	1.017	Be	Mg	Ge	Zr	Ga	Ga	In	Sc	2.974	1.112	
Sr	Cd	Sn	Zr	Ga	Ga	In	Y	1.301	0.521	Ba	Cd	Si	Zr	Al	Al	In	Sc	2.143	0.524	Ca	Sr	Ti	Hf	Al	Al	In	Y	2.562	0.882	Mg	Ca	Sr	Zn	Si	Sn	Hf	Hf	2.974	1.075	
Ba	Zn	Sn	Hf	In	In	Sc	Y	1.303	0.809	Ca	Sr	Zn	Cd	Ge	Ge	Zr	Hf	2.143	0.814	Be	Zn	Sn	Zr	Ga	Ga	In	Sc	2.562	0.921	Mg	Ca	Zr	Hf	Al	In	Sc	Sc	2.974	1.085	
Ca	Cd	Ge	Sn	Al	Al	In	Y	1.304	0.796	Be	Cd	Ge	Sn	Al	Ga	Sc	Sc	2.143	0.659	Ca	Sr	Zn	Zn	Si	Sn	Ti	Zr	2.562	1.057	Be	Mg	Ge	Ti	Al	Ga	Y	Y	2.974	1.216	
Ca	Cd	Ge	Sn	Al	Al	Ga	In	1.306	0.769	Mg	Zn	Sn	Zr	Ga	Ga	In	Y	2.143	0.579	Sr	Ba	Ge	Ti	Al	Al	Sc	Y	2.562	0.902	Ca	Ca	Sr	Zn	Si	Ge	Sn	Zr	2.974	1.159	
Ba	Zn	Ge	Ge	Ga	In	Sc	Y	1.307	0.601	Ca	Cd	Si	Hf	Al	Ga	Ga	In	2.143	0.789	Sr	Ba	Zr	Hf	Ga	Ga	Sc	Y	2.562	0.873	Be	Be	Ba	Zn	Ge	Sn	Ti	Hf	2.974	0.832	
Mg	Ba	Si	Sn	Ga	In	Y	Y	1.307	0.955	Ba	Cd	Si	Ti	Al	Al	In	Y	2.144	0.660	Ca	Sr	Zn	Zn	Si	Ge	Zr	Hf	2.562	0.922	Be	Mg	Si	Hf	Ga	Ga	In	Y	2.975	0.846	
Be	Sr	Si	Sn	Al	In	In	Sc	1.308	0.943	Be	Zn	Ge	Sn	Al	Al	In	Y	2.144	0.585	Be	Ca	Ba	Cd	Si	Sn	Ti	Ti	2.562	0.804	Be	Ca	Ge	Ti	Al	Ga	Sc	Sc	2.975	1.042	
Ba	Zn	Sn	Hf	Al	In	In	Sc	1.308	0.911	Ca	Cd	Ge	Sn	Al	Sc	Y	Y	2.144	0.789	Be	Ba	Ti	Zr	Ga	Ga	Sc	Y	2.563	0.869	Be	Mg	Sn	Zr	Ga	In	Sc	Sc	2.975	0.863	
Ca	Ba	Ge	Ge	Al	Ga	In	Y	1.308	0.735	Mg	Zn	Sn	Al	Ga	Ga	In	In	2.144	0.678	Mg	Ca	Sr	Cd	Ge	Sn	Zr	Zr	2.563	0.933	Be	Zn	Ti	Zr	Ga	Ga	In	Y	2.975	0.892	
Ba	Zn	Sn	Ti	Al	In	In	Y	1.308	0.817	Ca	Zn	Zn	Cd	Si	Ge	Sn	Zr	2.144	0.726	Be	Ba	Ba	Cd	Cd	Si	Ti	Zr	Hf	2.563	1.001	Mg	Sr	Ti	Zr	Al	Al	Ga	Sc	2.975	1.172
Sr	Cd	Sn	Hf	Ga	In	In	Sc	1.308	0.966	Sr	Ba	Si	Zr	Ga	In	In	Sc	2.144	0.691	Sr	Sr	Ti	Hf	Al	Ga	Sc	Y	2.563	1.009	Be	Cd	Ti	Zr	Ga	Ga	Sc	Y	2.975	0.956	
Be	Sr	Si	Ge	Ga	In	In	Y	1.310	0.898	Zn	Zn	Si	Ge	Al	Ga	In	Y	2.145	0.527	Mg	Zn	Sn	Zr	Ga	In	Sc	Sc	2.563	0.980	Be	Ca	Ba	Zn	Zn	Si	Ti	Ti	2.975	0.839	
Mg	Ba	Ge	Sn	Al	Al	In	Sc	1.311	0.886	Sr	Zn	Si	Zr	Al	Ga	Y	Y	2.145	0.506	Ca	Ba	Zr	Hf	Ga	In	Sc	Sc	2.563	0.948	Ca	Cd	Si	Ti	Al	Al	Sc	Y	2.975	0.801	
Sr	Ba	Ge	Sn	Al	Al	In	Sc	1.314	0.658	Zn	Cd	Si	Ge	Al	Al	In	Y	2.145	0.554	Mg	Ba	Ti	Zr	Ga	In	Sc	Sc	2.563	0.843	Zn	Cd	Ge	Ti	Ga	Sc	Sc	Y	2.976	0.747	
Mg	Sr	Ge	Sn	Al	In	Y	Y	1.315	0.641	Ca	Ba	Cd	Cd	Si	Ge	Ti	Zr	2.145	0.428	Mg	Sr	Sn	Zr	Al	Sc	Y	Y	2.563	0.940	Mg	Ca	Zn	Cd	Si	Si	Zr	Hf	2.976	0.772	
Ba	Cd	Sn	Hf	Al	In	Y	Y	1.315	0.607	Ba	Zn	Sn	Zr	In	In	Sc	Y	2.146	0.423	Be	Zn	Sn	Zr	In	Sc	Y	Y	2.563	0.914	Mg	Ba	Zn	Zn	Ge	Sn	Ti	Ti	2.976	0.734	
Ba	Cd	Sn	Hf	Ga	Ga	In	Sc	1.315	0.901	Be	Ba	Ti	Hf	Ga	In	Y	Y	2.146	0.777	Sr	Ba	Ge	Zr	In	Sc	Y	Y	2.563	0.845	Be	Mg	Mg	Cd	Ge	Sn	Zr	Hf	2.976	0.843	
Ca	Zn	Ge	Sn	Ga	Ga	In	Sc	1.316	0.886	Mg	Mg	Si	Sn	Al	Ga	In	Y	2.146	0.472	Mg	Ba	Zn	Cd	Ge	Ge	Ti	Hf	2.564	0.966	Ca	Zn	Si	Ti	In	Sc	Y	Y	2.976	0.829	
Ca	Cd	Si	Sn	Al	In	In	Sc	1.317	0.864	Ca	Zn	Si	Sn	In	Sc	Y	Y	2.146	0.476	Be	Cd	Si	Hf	Ga	In	In	Sc	2.564	0.943	Mg	Sr	Zn	Cd	Si	Si	Ti	Hf	2.976	0.791	
Ba	Cd	Sn	Ti	Ga	Ga	In	Y	1.317	0.824	Sr	Ba	Ti	Hf	Al	In	In	Y	2.146	0.591	Be	Mg	Si	Ge	Ga	In	In	Sc	2.564	0.941	Ca	Sr	Ti	Zr	Ga	Sc	Y	Y	2.977	0.773	
Be	Ba	Ge	Ge	Ga	In	Sc	Y	1.318	0.894	Be	Sr	Si	Ge	Al	Ga	Ga	Sc	2.146	0.604	Ca	Zn	Si	Hf	Al	Ga	Ga	Sc	2.564	1.058	Mg	Zn	Si	Hf	Ga	In	In	Sc	2.977	0.907	
Mg	Cd	Sn	Sn	Al	Ga	In	Sc	1.318	0.879	Mg	Cd	Si	Sn	Al	Al	Ga	Sc	2.147	0.567	Mg	Zn	Si	Sn	In	Sc	Sc	Y	2.564	0.920	Be	Cd	Si	Ti	Al	Al	In	Y	2.977	0.831	
Zn	Cd	Sn	Sn	Al	In	In	Y	1.318	0.856	Ca	Sr	Zn	Cd	Si	Si	Ge	Sn	2.147	0.827	Ca	Sr	Ge	Hf	Ga	Sc	Sc	Y	2.564	0.955	Be	Mg	Si	Ge	Al	Ga	Ga	In	2.977	0.881	
Ba	Cd	Ge	Hf	Ga	Ga	In	Y	1.319	0.809	Be	Cd	Ge	Hf	Al	In	In	Y	2.147	0.662	Mg	Cd	Ge	Ti	Al	Al	Ga	In	2.564	1.101	Mg	Mg	Ge	Ti	Al	Ga	In	Sc	2.977	0.980	
Sr	Cd	Si	Ti	Al	Ga	In	In	1.319	0.753	Ca	Zn	Sn	Hf	Al	Ga	Ga	Sc	2.147	0.615	Be	Sr	Si	Zr	Al	Al	Sc	Y	2.564	0.945	Be	Mg	Cd	Cd	Sn	Ti	Zr	Zr	2.977	0.884	
Ca	Cd	Si	Sn	In	In	Sc	Y	1.322	0.304	Be	Ba	Si	Si	Ge	Ga	Sc	Y	Y	2.147	0.801	Ca	Ba	Si	Ti	Al	Al	Ga	In	2.564	0.877	Ca	Zn	Ti	Hf	Al	Ga	Sc	Sc	2.977	0.732
Be	Sr	Ge	Sn	Al	Al	In	Y	1.323	0.292	Mg	Ba	Ge	Zr	Al	Al	Ga	In	2.147	0.658	Ca	Ba	Zr	Hf	Al	Al	In	Y	2.564	0.926	Mg	Mg	Si	Ge	Al	Ga	Sc	Y	2.977	0.709	
Ba	Zn	Si	Sn	Al	Ga	Ga	In	1.323	0.290	Sr	Ba	Ge	Zr	Al	Ga	In	Y	2.147	0.630	Ca	Ba	Zn	Cd	Si	Si	Ge	Ti	2.564	0.848	Ca	Zn	Si	Ti	Al	Ga	Sc	Sc	2.977	0.770	
Sr	Zn	Ge	Sn	Ga	Ga	In	Sc	1.323	0.328	Mg	Cd	Ge	Zr	Ga	Ga	In	Y	2.148	0.607	Ca	Sr	Zn	Zn	Si	Si	Ge	Sn	Ti	2.565	0.922	Be	Cd	Ti	Zr	Ga	In	Sc	Sc	2.978	0.763
Ca	Sr	Si	Ge	Ga	In	In	Y	1.324	0.320	Be	Sr	Sn	Al	In	In	Sc	Sc	2.148	0.617	Be	Sr	Si	Zr	Al	Ga	Ga	Y	2.565	1.017	Ca	Sr	Sr	Zn	Si	Ti	Ti	Hf	2.978	0.885	
Sr	Zn	Sn	Hf	Ga	Ga	In	Y	1.324	0.288	Zn	Cd	Ge	Sn	Al	Sc	Y	Y	2.148	0.567	Be	Sr	Cd	Cd	Si	Sn	Ti	Zr	2.565	0.885	Be	Ca	Ca	Zn	Cd	Ge	Ti	Zr	Hf	2.978	0.831
Ba	Zn	Si	Ge	Al	In	In	Y	1.325	0.591	Sr	Zn	Si	Sn	Ga	Sc	Sc	Y	2.148	0.830	Ca	Cd	Zr	Zr	Ga	In	Sc	Y	2.565	0.936	Be	Zn	Ge	Ti	Ga	Ga	Sc	Y	2.978	0.862	
Ca	Ba	Ge	Sn	Ga	Ga	Sc	Y	1.325	0.585	Mg	Zn	Si	Ge	Ga	In	In	Sc	2.148	0.669	Ba	Cd	Zr	Zr	In	Sc	Sc	Y	2.565	1.059	Be	Sr	Si	Zr	Al	Sc	Sc	Y	2.978	0.949	
Sr	Ba	Ge	Sn	Ga	Ga	Sc	Y	1.326	0.553	Sr	Ba	Si	Zr	Al	Ga	Ga	Y	2.148	0.599	Be	Ca	Sn	Ti	Ga	Sc	Y	Y	2.565	0.906	Be	Mg	Zr	Hf	Ga	Sc	Sc	Y	2.979	0.875	
Ba	Zn	Sn	Hf	Ga	In	In	Sc	1.327	0.387	Be	Mg	Sr	Cd	Si	Ge	Sn	Sn	2.148	0.828	Be	Ba	Ge	Zr	Al	Sc	Sc	Y	2.565	0.894	Be	Mg	Sn	Zr	Al	Al	Sc	Y	2.979	0.728	
Ba	Zn	Ge	Zr	Ga	In	In	Y	1.327	0.708	Ca	Sr	Ge	Hf	Al	In	In	Sc	2.148	0.692	Mg	Cd	Si	Ge	Al	Ga	Ga	Sc	2.565	0.941	Mg	Sr	Ti	Zr	Al	Ga	Sc	Sc	2.979	0.704	
Ba	Zn	Sn	Zr	Al	Ga	Ga	In	1.328	0.702	Sr	Ba	Zn	Cd	Si	Si	Zr	Hf	2.148	0.603	Ca	Zn	Si	Zr	Ga	In	Sc	Sc	2.565	0.820	Mg	Ba	Si	Ti	Ga	Sc	Y	Y	2.979	0.759	
Be	Ba	Ge	Sn	Al	Al	Ga	In	1.3																																

Mg	Cd	Ge	Sn	Al	Ga	Ga	In	1.370	0.423	Ca	Sr	Zn	Cd	Si	Ge	Zr	Zr	2.162	0.920	Mg	Ba	Zn	Cd	Ge	Ge	Ti	Zr	2.575	1.038	Be	Ba	Ba	Zn	Si	Ti	Zr	Hf	2.991	1.163	
Sr	Cd	Sn	Zr	Ga	In	In	Sc	1.370	0.455	Cd	Cd	Ge	Ti	Ga	In	In	Sc	2.163	0.778	Mg	Ca	Ge	Zr	Al	Al	In	Sc	2.575	0.938	Be	Mg	Sr	Cd	Si	Si	Ge	Hf	2.991	1.067	
Ba	Cd	Sn	Ti	Al	In	In	Sc	1.370	0.741	Zn	Cd	Sn	Hf	Al	In	In	Sc	2.163	0.824	Sr	Zn	Hf	Hf	Al	Ga	Sc	Y	2.575	0.953	Be	Mg	Sr	Cd	Si	Al	Ga	Sc	2.992	1.005	
Ba	Cd	Sn	Ti	Ga	In	In	Sc	1.370	0.729	Sr	Zn	Ge	Ti	Al	Al	Ga	In	2.163	1.012	Ca	Ca	Zr	Hf	Ga	In	Sc	Y	2.575	1.089	Be	Zn	Zn	Cd	Ge	Ge	Sn	Ti	2.992	1.225	
Ca	Cd	Ge	Sn	Ga	Ga	Sc	Y	1.370	0.767	Mg	Cd	Sn	Hf	Al	Ga	Ga	Y	2.163	0.850	Ba	Zn	Si	Ge	Al	Sc	Sc	Y	2.575	0.970	Be	Mg	Zn	Cd	Ge	Ge	Zr	Hf	2.992	1.112	
Mg	Cd	Ge	Sn	Al	In	In	Sc	1.371	0.727	Zn	Cd	Sn	Zr	Al	Ga	In	Sc	2.163	0.734	Ca	Sr	Ba	Cd	Si	Si	Sn	Hf	2.575	0.717	Sr	Sr	Ba	Zn	Si	Ge	Ti	Zr	2.992	0.745	
Ba	Zn	Ge	Hf	Ga	Ga	In	Y	1.372	0.816	Mg	Ba	Ge	Sn	Hf	Ga	In	Sc	2.163	0.748	Ca	Ba	Si	Ge	Al	Sc	Sc	Y	2.575	0.630	Mg	Zn	Si	Hf	Al	Al	Ga	In	2.992	0.726	
Ca	Ba	Si	Sn	Ga	Ga	In	Sc	1.372	0.804	Zn	Cd	Ge	Zr	Ga	Ga	In	Sc	2.163	0.654	Sr	Zn	Si	Hf	In	Sc	Sc	Y	2.575	0.724	Be	Zn	Si	Zr	In	Sc	Sc	Y	2.993	0.861	
Ca	Cd	Sn	Hf	Al	Ga	In	In	1.373	0.834	Ca	Zn	Ge	Ti	Ga	In	Sc	2.163	0.789	Zn	Cd	Sn	Ti	Al	Al	Sc	Y	2.575	0.785	Be	Mg	Sr	Cd	Ge	Ti	Zr	Zr	2.993	0.817		
Ca	Ba	Ge	Sn	Al	In	Y	Y	1.373	0.780	Ca	Sr	Si	Hf	Ga	In	In	Sc	2.164	0.822	Mg	Cd	Sn	Ti	Al	Al	Ga	Y	2.575	0.718	Be	Sr	Si	Ti	Al	Ga	Sc	Sc	2.993	0.813	
Sr	Ba	Si	Sn	Ga	Ga	In	Sc	1.374	0.861	Be	Ba	Ge	Hf	Al	Al	Ga	Y	2.164	0.930	Sr	Cd	Ge	Zr	Al	Sc	Sc	Y	2.575	0.975	Mg	Zn	Sn	Hf	Al	Sc	Sc	Y	2.993	1.093	
Mg	Cd	Si	Sn	Al	Ga	In	In	1.374	0.394	Ca	Ba	Zn	Cd	Si	Sn	Ti	2.164	0.861	Be	Ca	Ge	Ti	Ga	In	Sc	Sc	2.575	0.676	Be	Ba	Zr	Hf	Al	Al	Ga	In	2.993	1.377		
Ba	Zn	Sn	Zr	Al	In	In	Sc	1.375	0.352	Sr	Cd	Si	Si	Al	In	In	Sc	2.164	0.805	Be	Mg	Ca	Cd	Ge	Sn	Sn	Zr	2.576	0.517	Be	Be	Mg	Cd	Si	Ge	Sn	Ti	2.993	1.265	
Mg	Sr	Si	Sn	Ga	In	Y	Y	1.376	0.346	Mg	Ba	Ge	Zr	Ga	Ga	Sc	Y	2.165	0.761	Sr	Cd	Si	Ti	Al	Ga	Sc	Sc	2.576	0.424	Be	Zn	Ti	Hf	Al	In	In	Sc	2.993	1.170	
Mg	Cd	Ge	Sn	In	In	Sc	Y	1.376	0.264	Mg	Sr	Ge	Zr	Al	Al	In	Y	2.165	0.669	Be	Mg	Si	Ge	Ga	Ga	In	Y	2.576	0.279	Be	Cd	Ti	Zr	In	Sc	Sc	Y	2.993	0.921	
Zn	Cd	Ge	Sn	Al	In	Y	Y	1.376	0.252	Ca	Zn	Si	Zr	Ga	Ga	In	Y	2.165	0.759	Ca	Ba	Si	Zr	Al	Al	Ga	Sc	2.576	0.322	Zn	Cd	Si	Ti	Al	Al	Ga	Y	2.993	1.073	
Mg	Ca	Ge	Sn	Al	Ga	Ga	In	1.377	0.298	Cd	Cd	Si	Zr	Al	Ga	In	Y	2.165	0.725	Ca	Sr	Sr	Cd	Ge	Sn	Ti	Zr	2.576	0.236	Be	Zn	Si	Hf	Ga	Ga	In	Sc	2.994	0.976	
Sr	Zn	Ge	Hf	Al	In	In	Y	1.377	0.574	Zn	Cd	Zr	Zr	Ga	In	In	Y	2.165	0.796	Be	Cd	Zr	Hf	In	Sc	Y	Y	2.576	0.483	Mg	Ca	Si	Zr	In	Sc	Sc	Y	2.994	1.011	
Ca	Cd	Ge	Sn	Ga	In	In	Sc	1.377	0.563	Mg	Zn	Sn	Hf	Ga	In	In	Sc	2.165	0.849	Mg	Mg	Zn	Cd	Si	Ge	Sn	Hf	2.576	0.392	Zn	Cd	Ti	Hf	Ga	Sc	Sc	Y	2.994	1.127	
Sr	Ba	Si	Ge	Al	In	In	Y	1.377	0.615	Ca	Cd	Si	Ge	Al	In	In	Sc	2.165	0.819	Be	Sr	Ti	Hf	Al	Ga	Y	Y	2.576	0.309	Mg	Sr	Ti	Zr	Al	Al	Sc	Y	2.994	1.029	
Be	Ca	Ge	Sn	Ga	In	In	Sc	1.379	0.604	Be	Ca	Si	Sn	Al	Ga	Ga	Sc	2.165	0.771	Ca	Ba	Ba	Cd	Si	Ge	Ti	Zr	2.577	0.339	Be	Mg	Ti	Zr	Ga	In	In	Y	2.994	0.986	
Ba	Cd	Si	Sn	Ga	In	In	Sc	1.379	0.648	Be	Sr	Si	Ge	Al	In	In	Sc	2.166	0.898	Sr	Ba	Si	Hf	Al	Ga	Sc	Sc	2.577	0.521	Be	Zn	Cd	Cd	Si	Sn	Zr	Hf	2.994	1.238	
Ba	Cd	Sn	Zr	Ga	Al	In	Sc	1.380	0.636	Mg	Sr	Sn	Ti	Al	In	In	Sc	2.166	0.758	Be	Sr	Ba	Cd	Ge	Zr	Zr	Hf	2.577	0.372	Ca	Zn	Zr	Hf	Al	Ga	Ga	Sc	2.995	1.068	
Ba	Cd	Sn	Zr	Al	In	Y	Y	1.380	0.679	Ca	Ba	Ge	Zr	Ga	Ga	Sc	Y	2.166	0.912	Sr	Cd	Ge	Ti	Ga	Sc	Y	Y	2.577	0.558	Mg	Sr	Zn	Cd	Ge	Ti	Ti	Hf	2.995	1.089	
Be	Ba	Si	Sn	Ga	In	In	Sc	1.381	0.655	Be	Ba	Ge	Hf	Al	Al	In	Sc	2.166	1.005	Mg	Cd	Sn	Hf	Ga	Al	In	Y	Y	2.577	0.606	Zn	Cd	Si	Zr	In	Sc	Sc	Y	2.995	1.309
Sr	Ba	Ge	Sn	Al	In	Y	Y	1.381	0.731	Be	Zn	Si	Ge	Ga	In	Y	Y	2.166	0.849	Ca	Ba	Ti	Zr	Al	Al	In	Y	2.577	0.441	Mg	Zn	Cd	Cd	Si	Sn	Ti	Zr	2.995	1.119	
Sr	Zn	Si	Sn	Ga	Ga	In	Sc	1.383	0.708	Mg	Ba	Si	Hf	Al	In	In	Sc	2.166	0.840	Mg	Sr	Sr	Cd	Ge	Sn	Ti	Hf	2.577	0.355	Be	Ba	Si	Ti	Al	Sc	Sc	Y	2.995	0.837	
Mg	Sr	Si	Sn	Ga	Ga	In	Sc	1.383	0.692	Ba	Cd	Sn	Zr	Ga	Sc	Y	Y	2.167	0.839	Be	Ca	Ge	Hf	Al	Al	In	Sc	2.577	0.258	Mg	Ca	Zn	Cd	Sn	Zr	Zr	Hf	2.995	0.827	
Ba	Cd	Ge	Zr	Ga	Ga	In	Y	1.384	0.690	Ba	Cd	Zr	Zr	Al	Ga	In	Y	2.167	0.745	Sr	Zn	Ge	Hf	Al	Ga	In	Y	2.577	0.288	Be	Mg	Mg	Ba	Si	Ge	Sn	Hf	2.995	0.883	
Ba	Zn	Ge	Ge	Al	Ga	In	Sc	1.384	0.640	Ca	Sr	Si	Hf	Al	In	In	Sc	2.167	0.801	Mg	Cd	Si	Ti	Ga	Ga	In	Y	2.577	0.397	Be	Cd	Ge	Zr	Al	Al	Ga	Sc	2.995	1.083	
Ba	Cd	Ge	Ti	Al	In	In	Y	1.384	0.631	Ca	Cd	Si	Ti	Ga	Ga	In	Y	2.167	0.919	Be	Mg	Ba	Cd	Si	Si	Sn	Hf	2.578	0.574	Be	Mg	Sn	Zr	Al	Al	Ga	Y	2.995	1.318	
Ba	Cd	Si	Sn	Ga	Ga	Sc	Y	1.385	0.712	Ca	Zn	Si	Zr	Ga	In	Y	Y	2.167	0.794	Sr	Cd	Zr	Hf	Al	Ga	Ga	Sc	2.578	0.495	Be	Zn	Si	Ge	Al	Al	In	Sc	2.995	1.230	
Ba	Cd	Sn	Hf	Al	Ga	Ga	Y	1.386	0.935	Ba	Zn	Si	Zr	Ga	In	In	Sc	2.167	0.933	Ca	Ba	Ti	Hf	Ga	Ga	In	Sc	2.578	0.600	Be	Ca	Sr	Zn	Sn	Sn	Ti	Hf	2.995	1.178	
Mg	Ba	Ge	Sn	Al	Al	Ga	Sc	1.386	0.928	Mg	Ba	Ge	Hf	Al	Al	In	Sc	2.167	1.021	Be	Be	Si	Sn	Ga	In	Sc	Y	2.578	0.649	Be	Ca	Ti	Zr	Al	In	Sc	Sc	2.996	1.380	
Ca	Ba	Ge	Sn	Al	In	In	Sc	1.387	1.016	Zn	Cd	Sn	Hf	Al	Ga	Ga	Sc	2.167	0.876	Ba	Ba	Zn	Zr	Hf	Al	Al	Ga	In	2.578	0.550	Mg	Sr	Ba	Zn	Ge	Ge	Zr	Hf	2.996	1.273
Ca	Zn	Si	Sn	Al	Ga	Ga	In	1.387	1.027	Be	Ca	Si	Ge	Ga	Ga	In	Sc	2.167	0.894	Sr	Zn	Ge	Ti	In	Sc	In	Y	2.578	0.417	Be	Ca	Zn	Cd	Ge	Ge	Ti	Zr	2.996	0.943	
Sr	Sr	Si	Sn	Ga	In	Sc	Y	1.388	0.980	Be	Ba	Ca	Sn	Ti	Al	In	In	Sc	2.167	0.896	Be	Cd	Ti	Zr	In	Ga	In	Y	2.578	0.326	Be	Mg	Ca	Ba	Si	Ge	Sn	Sn	2.996	0.932
Ca	Sr	Ge	Sn	Al	In	Y	Y	1.388	0.972	Ca	Ba	Sn	Ti	Al	Ga	Y	Y	2.167	0.772	Be	Ca	Ti	Zr	Ga	In	In	Y	2.578	0.391	Mg	Sr	Ti	Hf	Al	Sc	Sc	Y	2.997	1.049	
Cd	Cd	Ge	Sn	Al	In	Sc	Y	1.390	1.052	Zn	Cd	Zr	Hf	Al	Ga	In	In	2.167	0.945	Be	Ba	Ba	Cd	Si	Ge	Ti	Zr	2.578	0.473	Be	Mg	Sr	Cd	Si	Ti	Zr	Zr	2.997	1.015	
Sr	Zn	Sn	Zr	Ga	Ga	In	Y	1.390	1.049	Ca	Cd	Ti	Hf	Ga	In	In	Y	2.167	0.966	Ca	Sr	Zr	Hf	Al	Ga	Ga	Y	2.578	0.402	Mg	Cd	Ge	Ti	Ga	Sc	Sc	Y	2.997	1.020	
Sr	Zn	Sn	Ti	Ga	In	In	Y	1.390	1.072	Be	Cd	Ge	Zr	Ga	In	In	Y	2.168	1.025	Be	Cd	Ge	Ti	Al	Ga	Y	Y	2.578	0.608	Be	Cd	Sn	Ti	Al	Sc	Sc	Y	2.998	1.277	
Ca	Sr	Ge	Sn	Al	Al	In	Sc	1.391	0.752	Ca	Sr	Ge	Ti	Al	Ga	Ga	Sc	2.168	0.866	Be	Zn	Si	Zr	Ga	In	Y	Y	2.578	0.680	Be	Mg	Si	Sn	Al	Ga	Ga	Sc	2.998	0.925	
Mg	Sr	Ge	Ge	Al	Ga	Ga	Y	1.391	0.713	Mg	Ba	Zn	Cd	Ge	Sn	Sn	Hf	2.168	0.811	Be	Sr	Ti	Zr	Ga	In	In	Sc	Sc	2.578	0.534	Be	Ca	Ti	Hf	Al	Al	Ga	In	2.998	0.828
Ba	Zn	Sn	Zr	Ga	In	In	Sc	1.391	0.704	Sr	Ba	Si	Sn	Al	Ga	Sc	Sc	Y	2.168	0.771	Be	Ca	Ba	Zn	Si	Ge	Ge	Sn	2.579	0.475	Be	Ba	Zn	Cd	Si	Ti	Zr	Zr	2.998	0.754
Be	Ba	Ge	Sn	In	Sc	Y	Y	1.392	0.680	Ca	Sr	Ge	Ti	Ga	In	Y	Y	2.168	0.698	Sr	Ba	Zr	Hf	Al	Ga	In	Sc	2.579	0.414	Be	Ca	Si	Si	Al	Ga	In	Y	2.998	0.607	
Ba	Cd	Sn	Hf	Al	Ga	Ga	Y	1.393	0.6																															

Ba	Zn	Ge	Ti	Ga	In	In	Y	1.435	0.692	Ca	Sr	Ge	Hf	Al	Al	Ga	Sc	2.180	0.785	Be	Sr	Ge	Hf	Al	Sc	Y	Y	2.587	0.868	Mg	Ba	Zn	Cd	Si	Ti	Ti	Zr	3.009	0.758		
Mg	Zn	Ge	Sn	Al	Ga	In	In	1.435	0.624	Mg	Cd	Ge	Hf	Al	Ga	Ga	In	2.180	0.846	Be	Ca	Zn	Cd	Sn	Ti	Hf		2.588	0.861	Be	Cd	Ge	Ti	Al	Al	Ga	Y	3.009	0.709		
Ca	Ba	Sn	Hf	Ga	In	In	Y	1.435	0.602	Mg	Zn	Ti	Zr	Al	In	Y	Y	2.180	0.883	Be	Ba	Zn	Zr	Hf	Al	In	Sc	Sc	2.588	0.802	Mg	Cd	Si	Zr	Al	Al	Ga	Y	3.010	0.736	
Zn	Cd	Si	Sn	Al	Ga	Ga	In	1.435	0.648	Mg	Sr	Zn	Cd	Sn	Sn	Zr	Hf	2.180	1.047	Be	Ba	Cd	Cd	Si	Ge	Zr	Hf	2.588	1.110	Mg	Ca	Sr	Cd	Sn	Ti	Ti	Hf	3.010	0.928		
Sr	Sr	Si	Sn	Al	Ga	In	Sc	1.435	0.247	Ca	Cd	Si	Sn	Al	Al	Sc	Y	2.180	0.964	Mg	Mg	Si	Sn	Al	Ga	Sc	Y	2.588	0.782	Mg	Ca	Ti	Hf	Ga	Sc	Y	Y	3.010	1.531		
Ca	Sr	Ge	Sn	Al	In	In	Sc	1.436	0.229	Mg	Zn	Sn	Hf	Al	Ga	Y	Y	2.180	0.914	Zn	Zn	Ge	Zr	Al	Ga	Sc	Y	2.588	0.630	Be	Mg	Ge	Zr	In	In	Sc	Sc	3.010	1.426		
Ce	Ba	Sn	Hf	Ga	In	In	Y	1.436	0.226	Be	Cd	Ge	Sn	Al	Al	Ga	Y	2.180	0.851	Be	Mg	Sr	Cd	Ge	Sn	Hf		2.588	0.519	Be	Mg	Si	Ti	In	In	Sc	Y	3.010	1.315		
Ba	Cd	Sn	Ti	Ga	In	Y	Y	1.437	0.245	Ca	Sr	Sn	Ti	Al	Ga	Y	Y	2.181	0.789	Mg	Ba	Si	Ti	Al	Al	Ga	In	2.588	0.394	Be	Ca	Zn	Cd	Sn	Zr	Hf	Hf	3.010	1.074		
Mg	Ba	Si	Sn	Ga	In	Sc	Y	1.437	0.234	Mg	Sr	Ge	Hf	Ga	Ga	Sc	Y	2.181	0.870	Ca	Sr	Sr	Cd	Si	Ge	Sn	Ti	2.588	0.438	Ca	Sr	Sr	Zn	Si	Ge	Sn	Ti	3.010	1.238		
Ba	Cd	Ge	Ti	Al	Ga	In	In	1.438	0.190	Cd	Cd	Ge	Hf	Al	Ga	Sc	Y	2.181	0.816	Sr	Ba	Si	Ti	Al	In	Sc	Sc	2.589	0.333	Be	Mg	Zr	Hf	Al	Ga	Y	Y	3.011	1.123		
Ca	Sr	Si	Ge	Al	In	In	Y	1.438	0.479	Mg	Zn	Ge	Zr	Ga	In	In	Y	2.181	0.916	Ba	Cd	Ti	Zr	Al	Al	Ga	Sc	2.589	0.595	Mg	Sr	Sr	Zn	Si	Ge	Sn	Zr	3.011	1.156		
Be	Ba	Ge	Sn	Al	Ga	Ga	Y	1.438	0.471	Sr	Cd	Ge	Hf	Al	Ga	Y	Y	2.182	0.966	Ca	Cd	Zr	Hf	Ga	Ga	In	Sc	2.589	0.514	Ca	Sr	Sr	Zn	Ge	Sn	Ti	Hf	3.011	1.299		
Ce	Sr	Ge	Ge	Ga	In	Sc	Y	1.438	0.422	Be	Ba	Ge	Hf	In	Sc	Sc	Y	2.182	0.915	Ca	Sr	Ba	Cd	Si	Si	Sn	Zr	2.589	0.412	Be	Mg	Ti	Hf	Al	In	In	Y	3.011	1.182		
Ca	Ba	Ge	Ge	Ga	In	Sc	Y	1.438	0.245	Mg	Sr	Sn	Hf	In	Sc	Sc	Y	2.182	0.879	Be	Ba	Si	Hf	Ga	Ga	Sc	Y	Y	2.590	0.443	Mg	Zn	Zn	Cd	Si	Sn	Ti	Hf	3.011	1.129	
Sr	Ba	Ge	Ge	Ga	In	Sc	Y	1.439	0.538	Mg	Ba	Zn	Cd	Ge	Sn	Sn	Zr	2.182	0.993	Mg	Ba	Ti	Hf	Ga	Ga	Sc	Y	Y	2.590	0.619	Be	Mg	Mg	Cd	Si	Ge	Sn	Zr	3.011	1.386	
Ba	Zn	Ge	Zr	Ga	Ga	In	Y	1.440	0.529	Ba	Ba	Zn	Sn	Hf	Ga	Ga	Y	2.182	0.843	Be	Zn	Si	Sn	In	Al	Ga	Ga	Y	2.590	0.462	Ca	Cd	Si	Zr	Ga	Sc	Sc	Y	3.011	1.207	
Ba	Zn	Ge	Hf	In	In	Sc	Y	1.440	0.469	Sr	Cd	Si	Ge	In	Sc	Y	Y	2.182	1.020	Zn	Cd	Ti	Zr	Al	Ga	Sc	Y	Y	2.590	0.659	Be	Ca	Si	Zr	Al	Al	In	Sc	3.011	1.225	
Be	Cd	Ge	Sn	Ga	In	In	Sc	1.440	0.274	Be	Zn	Ge	Sn	Ga	In	Sc	Sc	2.182	1.105	Be	Zn	Sn	Hf	Ga	Ga	Sc	Y	Y	2.590	0.711	Zn	Cd	Ti	Zr	Al	Al	Sc	Y	3.011	1.464	
Sr	Cd	Si	Ge	In	In	In	Sc	1.440	0.315	Mg	Sr	Ge	Hf	Al	Al	Ga	In	2.182	0.939	Sr	Ba	Ti	Zr	Ga	Ga	Sc	Y	Y	2.590	0.537	Be	Mg	Ge	Zr	Ga	Sc	Y	Y	3.012	1.264	
Mg	Ca	Si	Sn	Al	In	In	Sc	1.440	0.320	Mg	Zn	Sn	Ti	Ga	In	Y	Y	2.182	0.894	Ba	Cd	Ti	Zr	Hf	In	Sc	Y	Y	2.590	0.406	Zn	Zn	Ti	Zr	Al	Ga	Sc	Y	3.012	0.924	
Sr	Ba	Ge	Ge	Al	Ga	In	Sc	1.441	0.276	Be	Zn	Ge	Sn	Ga	Ga	Sc	Y	2.182	0.898	Sr	Ba	Zr	Hf	In	In	Sc	Y	Y	2.590	0.318	Ca	Cd	Si	Hf	Al	Al	Sc	Y	Y	3.012	0.927
Be	Ba	Si	Sn	Al	Ga	Ga	Y	1.441	0.269	Be	Ba	Si	Ti	Ga	In	Y	Y	2.182	0.848	Ca	Ca	Ti	Hf	Al	In	In	Sc	Y	2.590	0.390	Mg	Ca	Sr	Zn	Si	Si	Ge	Sn	3.012	1.024	
Ba	Zn	Sn	Ti	Al	Ga	In	In	1.442	0.228	Be	Ca	Si	Sn	Al	Al	Ga	Y	2.182	0.900	Be	Be	Zn	Cd	Si	Ge	Sn	Hf		2.591	0.496	Mg	Cd	Ti	Zr	Ga	In	Sc	Sc	3.013	1.224	
Sr	Cd	Ge	Ge	Al	In	Sc	Y	1.443	0.214	Be	Zn	Ge	Sn	Sn	Al	Al	Ga	In	2.183	1.006	Mg	Sr	Zr	Hf	Ga	Ga	In	Y	2.591	0.668	Be	Ca	Zr	Zr	Al	Ga	Sc	Y	3.013	1.465	
Sr	Cd	Ge	Ti	Ga	In	In	Y	1.443	0.177	Be	Ca	Sn	Hf	Ga	In	In	Sc	2.183	0.891	Ca	Zn	Si	Hf	Al	Al	Ga	Sc	Y	2.591	0.599	Be	Mg	Hf	Hf	Ga	In	Sc	Y	3.013	1.386	
Ba	Cd	Si	Sn	Al	Ga	Ga	Y	1.443	0.482	Zn	Zn	Sn	Zr	Ga	In	In	Sc	Y	2.183	1.032	Ca	Ba	Ti	Hf	Ga	Ga	Sc	Y	2.591	0.695	Be	Mg	Ba	Zn	Ge	Ge	Sn	Ti	3.014	1.311	
Mg	Sr	Ge	Sn	Al	Al	Sc	Sc	1.444	0.470	Mg	Ba	Si	Ti	Ga	In	In	Sc	2.183	1.113	Ba	Zn	Ti	Hf	Al	Ga	Ga	Sc	Sc	2.591	0.750	Be	Zn	Ge	Zr	Al	Sc	Y	Y	3.014	1.534	
Sr	Cd	Ge	Sn	Al	Al	Ga	Sc	1.444	0.433	Sr	Ba	Si	Ge	In	Sc	Sc	Y	2.183	0.978	Sr	Ba	Zr	Hf	Ga	Ga	In	Sc	Sc	2.591	0.660	Be	Ba	Zn	Cd	Ge	Ti	Ti	Hf	3.014	1.436	
Ba	Cd	Sn	Ti	Al	Ga	Ga	In	1.444	0.254	Ca	Zn	Si	Ti	Al	In	In	Y	2.183	0.938	Be	Be	Ge	Sn	Al	In	Sc	Y	2.591	0.462	Be	Be	Mg	Cd	Ge	Sn	Ti	Hf	3.014	1.027		
Mg	Sr	Ge	Ge	Ga	In	Sc	Y	1.444	0.568	Mg	Sr	Si	Ge	Al	Al	In	Sc	2.183	0.945	Be	Ba	Ti	Zr	Al	Al	Ga	Sc	Y	2.591	0.380	Be	Ca	Sr	Zn	Ge	Ge	Sn	Hf	3.014	1.030	
Sr	Zn	Ge	Zr	Al	In	In	Y	1.445	0.555	Mg	Ba	Zn	Cd	Ge	Sn	Zr	Zr	2.183	0.888	Mg	Cd	Si	Ti	In	In	Sc	Y	2.592	0.598	Be	Mg	Ge	Ti	Al	In	In	Sc	3.014	1.207		
Ba	Cd	Ge	Hf	Ga	In	Y	Y	1.446	0.512	Be	Sr	Sn	Hf	Al	Al	Ga	Sc	2.184	0.988	Mg	Cd	Si	Hf	Al	In	Y	Y	2.592	0.520	Be	Be	Sr	Zn	Si	Sn	Ti	Hf	3.014	1.002		
Ca	Zn	Ge	Sn	Al	Ga	Ga	Y	1.448	0.323	Be	Ba	Sn	Cd	Zr	Ga	In	In	2.184	1.014	Be	Ba	Zr	Hf	Al	Al	In	Y	2.592	0.458	Be	Mg	Ba	Zn	Sn	Sn	Zr	Zr	3.014	1.121		
Ca	Zn	Si	Sn	Ga	In	Y	Y	1.448	0.348	Sr	Ba	Si	Ti	Ga	In	In	Sc	2.184	1.128	Be	Zn	Ge	Zr	Ga	In	In	Sc	2.592	0.715	Mg	Ca	Zn	Zn	Si	Sn	Ti	Hf	3.015	1.427		
Ba	Zn	Si	Ge	Ga	In	Y	Y	1.449	0.228	Be	Ba	Si	Hf	Ga	Ga	In	Y	2.185	0.968	Ca	Ba	Zn	Zr	Ga	In	In	Sc	2.593	0.773	Ca	Ba	Ba	Zn	Si	Ge	Ti	Zr	3.015	1.057		
Mg	Cd	Sn	Sn	Al	In	Sc	Y	1.449	0.180	Sr	Cd	Ti	Zr	Ga	In	In	Sc	2.185	0.917	Ca	Ca	Zn	Cd	Ge	Ti	Zr	Hf	2.593	0.635	Be	Mg	Si	Hf	Ga	In	In	Sc	3.015	0.969		
Sr	Zn	Sn	Hf	Al	In	In	Y	1.450	0.172	Ca	Ba	Zn	Cd	Si	Si	Sn	Hf	2.185	0.859	Ca	Cd	Ge	Zr	In	Sc	Sc	Y	2.593	0.558	Sr	Ba	Ti	Zr	Al	Sc	Y	Y	3.015	0.878		
Mg	Ba	Ge	Sn	In	Sc	Sc	Y	1.450	0.039	Ba	Ba	Zn	Sn	Zr	Ga	Sc	Y	Y	2.185	0.815	Mg	Zn	Ge	Hf	Al	Ga	Ga	Y	2.593	0.514	Ca	Sr	Ba	Zn	Si	Si	Sn	Zr	3.016	0.734	
Be	Ba	Si	Sn	Al	In	Y	Y	1.450	0.024	Mg	Ba	Si	Si	Al	Ga	In	Y	2.185	0.883	Ca	Zn	Si	Hf	Al	Ga	Ga	Y	Y	2.593	0.506	Mg	Zn	Ti	Ti	Ga	In	Sc	Y	3.016	0.851	
Mg	Sr	Si	Sn	Al	Ga	Ga	Y	1.451	0.005	Ba	Zn	Si	Hf	Al	Al	Ga	In	2.185	0.833	Sr	Ba	Zr	Hf	Al	Ga	Ga	Y	Y	2.593	0.434	Be	Cd	Ge	Ti	Al	Ga	Ga	Sc	3.016	0.756	
Ba	Zn	Ge	Hf	Ga	In	Y	Y	1.451	0.322	Sr	Zn	Zr	Hf	Al	In	In	Y	2.185	0.944	Sr	Sr	Zr	Hf	Al	Ga	Ga	Sc	Y	2.593	0.704	Be	Cd	Si	Hf	In	Sc	Sc	Y	3.016	0.827	
Ca	Cd	Si	Ge	Al	Ga	In	In	1.451	0.308	Mg	Sr	Sn	Ti	Al	Ga	Y	Y	2.186	0.979	Be	Ca	Ge	Hf	Al	Al	Ga	Y	2.593	0.587	Ca	Cd	Zr	Hf	Al	Sc	Y	Y	3.016	0.935		
Ba	Cd	Sn	Hf	Al	Ga	Ga	Sc	1.452	0.293	Ca	Cd	Ti	Hf	Al	In	In	Y	2.186	0.933	Be	Ba	Si	Zr	Al	Al	Ga	Y	2.593	0.518	Be	Ca	Si	Ti	In	Sc	Sc	Y	3.016	0.837		
Ca	Ba	Sn	Zr	Al	In	In	Y	1.452	0.196	Be	Ca	Si	Sn	Ga	Ga	Sc	Y	2.186	0.903	Sr	Zn	Ge	Zr	Al	Sc	Y	Y	2.594	0.542	Mg	Zn	Ge	Ti	In	Sc	Y	Y	3.016	0.772		
Ba	Cd	Ge	Hf	Al	Ga	Ga	In	1.453	0.362	Ca	Ba	Si	Hf	Ga	Ga	In	Y	2.186	1.003	Be	Mg	Ge	Zr	Al	Ga	Sc	Sc	Y	2.594	0.654	Ca										

Ba	Cd	Ge	Hf	Ga	Ga	In	Sc	1.480	0.709	Be	Be	Ba	Cd	Si	Ge	Sn	Hf	2.196	0.967	Ba	Ba	Si	Ti	Al	Ga	Sc	Y	2.602	0.647	Be	Ca	Ti	Hf	Al	Ga	Ga	Y	3.028	0.896	
Be	Sr	Ge	Sn	In	Sc	Sc	Y	1.480	0.687	Sr	Ba	Si	Ti	Al	In	In	Sc	2.196	1.006	Be	Ba	Ba	Zn	Ge	Sn	Zr	Hf	2.602	0.631	Mg	Cd	Ge	Zr	Ga	Sc	Sc	Y	3.028	1.019	
Sr	Cd	Sn	Hf	Al	Ga	Y	Y	1.480	0.613	Ba	Cd	Sn	Hf	Al	Sc	Y	Y	2.196	0.942	Be	Ba	Ca	Si	Al	In	In	Sc	2.602	0.550	Mg	Cd	Zr	Hf	In	Sc	Sc	Y	3.028	0.915	
Sr	Zn	Ge	Hf	Ga	Ga	In	Y	1.481	0.879	Be	Sr	Ge	Zr	Al	Al	In	Y	2.196	1.093	Sr	Cd	Ti	Hf	Al	Ga	Sc	Sc	2.602	0.825	Mg	Ca	Ca	Cd	Ti	Zr	Hf	Sc	3.028	0.970	
Zn	Ge	Ge	Al	Ga	In	Sc	Sc	1.481	0.859	Mg	Sr	Si	Ti	Al	In	In	Y	2.196	1.093	Mg	Sr	Si	Zr	Ga	Ga	Sc	Y	2.602	0.702	Mg	Cd	Ge	Ti	In	Sc	Sc	Y	3.029	1.091	
Ca	Zn	Sn	Hf	Ga	In	In	Y	1.481	0.780	Sr	Zn	Ti	Zr	Ga	In	Y	Y	2.196	1.033	Sr	Cd	Ge	Zr	Al	Sc	Sc	Y	2.602	0.623	Be	Mg	Sr	Zn	Si	Ge	Sn	Sc	3.029	0.984	
Be	Sr	Ge	Ge	Al	Ga	In	Y	1.483	0.763	Ca	Cd	Ge	Ti	Al	Al	Ga	In	2.196	1.038	Be	Zn	Si	Ge	Al	Ga	Ga	In	2.603	0.661	Be	Ba	Zn	Zn	Si	Ge	Sn	Ti	3.029	0.924	
Ca	Zn	Sn	Al	Al	In	Y	Y	1.485	0.960	Ca	Ba	Si	Sn	Al	Sc	Sc	Y	2.196	1.118	Be	Mg	Ge	Zr	In	In	Sc	Y	2.603	0.769	Be	Be	Mg	Cd	Si	Sn	Ti	Hf	3.029	1.129	
Sr	Ba	Sn	Ti	Ga	In	In	Y	1.485	0.940	Ca	Sr	Zn	Cd	Si	Sn	Ti	Zr	2.196	0.976	Ca	Sr	Zn	Cd	Si	Ti	Zr	Zr	2.603	0.669	Mg	Sr	Si	Ti	Ga	Sc	Sc	Y	3.029	0.984	
Ba	Zn	Ge	Zr	Al	Ga	In	In	1.486	0.851	Be	Ca	Ge	Ti	Al	In	In	Y	2.196	1.177	Be	Ca	Ge	Zr	Al	Al	Ga	In	2.603	0.853	Ca	Ca	Ba	Zr	Si	Ge	Zr	Hf	3.029	1.010	
Ba	Zn	Sn	Zr	Al	Ga	Y	Y	1.486	0.817	Ca	Sr	Zn	Zr	Al	Al	In	Y	2.197	1.221	Sr	Ba	Si	Zr	Al	Ga	Y	Y	2.603	0.856	Mg	Ca	Sr	Cd	Ge	Ti	Ti	Hf	3.029	1.218	
Be	Sr	Si	Ge	Ga	In	In	Sc	1.486	0.865	Sr	Zn	Sn	Zr	In	Sc	Y	Y	2.197	1.064	Sr	Cd	Si	Hf	In	Sc	Sc	Y	2.603	0.738	Be	Sr	Zn	Zn	Si	Ge	Sn	Hf	3.029	1.051	
Ba	Zn	Sn	Zr	Ga	Ga	In	Sc	1.487	0.358	Sr	Zn	Sn	Hf	In	Sc	Sc	Y	2.197	1.014	Ca	Sr	Zr	Hf	Al	Ga	Ga	In	2.603	0.622	Mg	Sr	Sr	Zn	Ge	Sn	Ti	Hf	3.029	0.713	
Ca	Ba	Sn	Zr	Ga	In	In	Y	1.487	0.336	Ba	Zn	Ge	Hf	In	Sc	Y	Y	2.197	1.009	Mg	Cd	Si	Hf	Ga	Ga	In	Sc	2.603	0.545	Sr	Ba	Si	Hf	Al	Sc	Y	Y	3.030	0.729	
Mg	Ba	Si	Ge	Ga	Ga	In	Y	1.487	0.332	Zn	Cd	Ge	Ti	Al	In	Y	Y	2.197	1.008	Be	Ba	Si	Ti	Al	In	Sc	Sc	2.604	0.660	Mg	Ba	Si	Ti	Al	Al	Sc	Y	3.030	0.865	
Ca	Ba	Si	Sn	Ga	In	In	Sc	1.487	0.360	Ca	Sr	Zn	Cd	Ge	Sn	Ti	Ti	2.197	1.045	Ca	Sr	Si	Ti	Ga	In	Sc	Sc	2.604	0.668	Mg	Mg	Zr	Hf	Ga	In	Sc	Y	3.030	0.936	
Ca	Ba	Si	Sn	Ga	In	Y	Y	1.488	0.349	Ca	Ca	Zn	Cd	Ge	Sn	Ti	Hf	2.197	1.116	Be	Sr	Ba	Zn	Si	Si	Ge	Sn	2.604	0.774	Mg	Ca	Zn	Cd	Si	Si	Ge	Hf	3.030	1.127	
Be	Ca	Si	Sn	Al	In	In	Y	1.489	0.286	Mg	Cd	Ge	Zr	Al	In	In	Sc	2.197	1.020	Mg	Ba	Si	Hf	In	Sc	Sc	Y	2.604	0.738	Be	Zn	Sn	Ti	Al	Al	Ga	Y	3.030	1.069	
Cd	Cd	Sn	Hf	Al	Ga	In	Y	1.490	0.578	Ca	Sr	Si	Si	Al	Ga	In	Y	2.198	1.176	Ba	Cd	Si	Ti	Al	Al	In	Sc	Y	2.604	0.844	Mg	Cd	Ti	Hf	Al	In	Sc	Sc	3.031	1.014
Sr	Ba	Si	Sn	Al	Al	Ga	Y	1.491	0.569	Mg	Cd	Si	Sn	Al	Ga	Ga	Sc	2.198	1.215	Mg	Ba	Ti	Hf	Al	In	In	Sc	Sc	2.604	0.850	Mg	Cd	Ti	Hf	Ga	Sc	Y	Y	3.031	1.206
Ba	Zn	Sn	Zr	Al	Al	In	Y	1.491	0.501	Ca	Ba	Sn	Zr	In	Sc	Sc	Y	2.198	1.099	Ca	Zn	Sn	Zr	Ga	Sc	Sc	Y	2.604	0.793	Mg	Mg	Si	Ti	Ga	In	Sc	Y	3.031	1.129	
Ba	Cd	Sn	Hf	Al	Al	Ga	In	1.491	0.305	Sr	Sr	Si	Hf	Ga	In	Sc	Y	2.198	1.044	Sr	Zn	Ti	Hf	Al	Ga	Ga	Sc	2.604	0.631	Be	Ca	Ca	Cd	Si	Ti	Zr	Hf	3.031	0.733	
Sr	Ba	Sn	Hf	Al	Al	In	Sc	1.491	0.641	Mg	Sr	Cd	Cd	Ge	Sn	Zr	Hf	2.198	1.042	Sr	Zn	Ge	Ti	Ga	Sc	Y	Y	2.604	0.559	Sr	Ba	Ba	Zn	Sn	Ti	Zr	Hf	3.032	0.748	
Ba	Zn	Sn	Ti	In	In	Sc	Y	1.492	0.631	Be	Ca	Ge	Hf	Ga	Ga	In	Y	2.198	1.043	Ca	Ca	Ba	Cd	Si	Sn	Ti	Hf	2.604	0.703	Sr	Ba	Ba	Zn	Ga	Ti	Zr	Hf	3.032	0.948	
Ba	Cd	Sn	Ti	Ga	Ga	In	Sc	1.492	0.552	Mg	Ca	Sn	Ti	Al	Ga	Ga	Y	2.199	1.079	Mg	Mg	Ge	Hf	Al	In	Sc	Sc	Y	2.604	0.667	Ca	Sr	Si	Ti	Ga	Sc	Sc	Y	3.032	0.779
Mg	Ba	Sn	Hf	In	In	Sc	Y	1.493	0.338	Be	Sr	Si	Hf	Ga	In	In	Sc	2.199	1.095	Mg	Ba	Ge	Zr	Ga	Sc	Sc	Y	Y	2.605	0.615	Mg	Ba	Zn	Zn	Si	Ge	Ti	Hf	3.033	0.810
Sr	Zn	Si	Ge	Al	Ga	In	In	1.493	0.384	Mg	Ca	Ge	Ge	Al	Ga	Sc	Y	2.199	1.247	Ca	Ba	Hf	Hf	Al	Ga	In	Sc	2.605	0.854	Mg	Ca	Si	Hf	Al	Al	Ga	Sc	3.033	1.116	
Be	Cd	Si	Sn	Al	Ga	In	In	1.494	0.693	Ba	Zn	Cd	Cd	Si	Ge	Ti	Zr	2.199	0.928	Be	Mg	Sn	Hf	Al	Al	In	Y	2.605	0.909	Be	Ca	Zn	Cd	Ge	Ti	Hf	Hf	3.033	1.188	
Be	Ba	Si	Ge	Al	Ga	In	In	1.494	0.652	Sr	Cd	Si	Zr	Al	Ga	Ga	Sc	2.199	0.844	Ca	Ba	Zr	Hf	Al	In	Sc	Sc	2.605	0.769	Mg	Mg	Ba	Cd	Ge	Ti	Zr	Hf	3.033	1.132	
Zn	Cd	Si	Ge	Ga	In	In	Y	1.494	0.645	Mg	Ba	Ge	Zr	Al	In	Sc	Sc	2.199	0.804	Ca	Ba	Ti	Zr	Al	Al	Ga	Sc	Y	2.605	0.688	Mg	Sr	Sr	Zn	Si	Sn	Ti	Hf	3.033	1.016
Sr	Zn	Si	Ge	Ga	Ga	In	Y	1.494	0.610	Mg	Cd	Sn	Zr	Al	Al	Ga	In	2.199	0.751	Ca	Sr	Zr	Hf	Al	Al	In	Y	2.605	0.669	Mg	Ca	Si	Ti	Al	Al	Ga	In	3.033	0.947	
Ba	Cd	Sn	Hf	Al	Al	In	Sc	1.494	0.596	Sr	Zn	Ge	Ti	Al	In	Sc	Sc	2.199	0.786	Be	Mg	Si	Sn	Al	Ga	Ga	In	2.605	0.647	Be	Zn	Ge	Zr	In	Sc	Sc	Y	3.034	1.041	
Sr	Zn	Zn	Zr	Ga	In	In	Sc	1.494	0.547	Ca	Zn	Si	Zr	In	In	Sc	Y	2.199	0.759	Zn	Zn	Ge	Ti	Al	In	Sc	Y	2.606	0.571	Mg	Sr	Si	Hf	Al	Sc	Sc	Y	3.034	0.960	
Mg	Sr	Sn	Hf	Ga	In	In	Y	1.495	0.853	Be	Cd	Ge	Ge	Al	In	Sc	Y	2.200	0.872	Be	Mg	Ge	Zr	Al	In	In	Y	2.606	0.845	Be	Mg	Ca	Cd	Ge	Zr	Hf	Hf	3.034	1.007	
Ba	Cd	Ge	Ti	Ga	Ga	In	Y	1.495	0.840	Sr	Ba	Ge	Ti	Ga	In	Sc	Sc	2.200	0.839	Ca	Zn	Cd	Cd	Si	Ge	Ti	Hf	2.606	0.718	Mg	Ca	Zn	Zn	Si	Sn	Ti	Zr	3.034	1.117	
Sr	Cd	Ge	Hf	In	In	Sc	Y	1.496	0.791	Ba	Cd	Si	Ge	Al	Al	Sc	Y	2.200	0.818	Ca	Cd	Ti	Zr	Al	Al	In	Sc	Y	2.606	0.644	Be	Mg	Ba	Zn	Ge	Sn	Zr	Zr	3.034	1.034
Be	Ba	Si	Ge	Ga	Ga	In	Y	1.496	0.584	Zn	Zn	Si	Ge	Ga	In	Sc	Y	2.200	0.835	Be	Cd	Sn	Zr	Ga	Ga	Sc	Y	2.606	0.680	Be	Mg	Sr	Cd	Sn	Ti	Ti	Hf	3.034	0.960	
Sr	Zn	Si	Ge	Ga	Ga	In	Sc	1.496	0.962	Mg	Cd	Si	Sn	Al	In	Sc	Sc	2.200	0.935	Mg	Zn	Sn	Hf	In	Sc	Y	Y	2.606	0.779	Be	Sr	Ba	Zn	Zr	Hf	Hf	3.035	1.123		
Be	Sr	Ge	Sn	In	Sc	Y	Y	1.496	0.950	Ca	Zn	Sn	Hf	Al	Al	Sc	Y	2.200	0.821	Ca	Ba	Zr	Hf	Al	Al	Ga	Y	Y	2.606	0.687	Mg	Sr	Sr	Zn	Ge	Sn	Ti	Zr	3.035	1.014
Ca	Cd	Sn	Ti	Ga	In	In	Y	1.496	0.894	Be	Sr	Sn	Zr	Al	Al	Ga	Y	2.200	0.969	Ca	Ca	Si	Hf	Al	Ga	Sc	Y	2.606	0.870	Ca	Sr	Si	Zr	Ga	Sc	Y	Y	3.035	1.033	
Sr	Cd	Si	Sn	Al	Ga	Ga	Sc	1.497	0.678	Be	Sr	Ba	Cd	Si	Si	Ge	Sn	2.200	1.004	Mg	Ba	Zn	Cd	Si	Si	Sn	Hf	2.606	0.866	Mg	Zn	Zn	Cd	Si	Sn	Ti	Zr	3.035	1.217	
Ca	Cd	Ge	Sn	Al	In	Sc	Y	1.498	0.724	Zn	Cd	Si	Zr	Al	In	In	Y	2.201	0.877	Ca	Zn	Ge	Hf	In	Sc	Sc	Y	2.606	0.757	Ca	Sr	Si	Ti	Al	Al	Sc	Y	3.035	1.085	
Ba	Cd	Si	Sn	Al	Al	In	Sc	1.499	0.518	Sr	Zn	Zn	Cd	Si	Sn	Ti	Hf	2.201	0.904	Ca	Cd	Si	Si	Al	Ga	Sc	Y	2.607	0.647	Be	Ca	Zn	Cd	Sn	Zr	Hf	3.035	0.773		
Ba	Cd	Sn	Ti	Al	Ga	Ga	Y	1.499	0.463	Ba	Zn	Hf	Hf	Al	Ga	In	Y	2.201	0.871	Mg	Ca	Cd	Cd	Si	Ge	Zr	Hf	2.607	0.572	Be	Zn	Si	Hf	Ga	In	Sc	Y	3.035	0.803	
Cd	Cd	Si	Sn	Al	Ga	In	Sc	1.499	0.454	Mg	Ba	Ge	Ti	Ga	In	Sc	Sc	2.201	0.799	Ba	Zn	Ti	Hf	Al	Al	Sc	Y	2.607	0.687	Be	Ca	Ba	Zn	Si	Ge	Hf	Hf	3.036	0.942	
Zn	Zn	Ge	Sn	Al	Ga																																			

Sr	Zn	Sn	Hf	Ga	In	Sc	1.526	1.163	Ca	Cd	Si	Ge	Al	Al	Ga	Y	2.217	1.363	Ba	Cd	Ti	Zr	Al	Al	Sc	Y	2.616	0.659	Be	Mg	Ba	Cd	Si	Si	Ge	Ti	3.049	0.924		
Mg	Cd	Si	Sn	Ga	In	Sc	1.526	1.151	Mg	Cd	Sn	Hf	Ga	Ga	Sc	Y	2.217	1.088	Ca	Zn	Hf	Hf	Ga	In	Sc	Y	2.616	0.622	Be	Zn	Ti	Zr	Al	In	In	Sc	3.049	0.855		
Ca	Sr	Si	Sn	Al	Ga	Sc	1.527	1.095	Ca	Ba	Cd	Si	Hf	Al	Ga	Sc	2.217	1.088	Ca	Ba	Ge	Hf	Al	Sc	Sc	Y	2.617	0.712	Mg	Zn	Ti	Zr	Hf	Al	Sc	Y	3.049	0.846		
Ba	Zn	Ge	Zr	Al	In	Sc	1.528	0.873	Mg	Ba	Si	Hf	Ga	In	Y	Y	2.217	1.405	Ca	Zn	Zr	Hf	Al	In	In	Sc	2.617	0.684	Mg	Ca	Ti	Hf	Al	Al	In	Sc	3.049	0.888		
Ca	Cd	Ge	Sn	Al	Al	Ga	Y	1.529	0.922	Ba	Cd	Sn	Ti	In	Sc	Sc	Y	2.217	1.117	Be	Ba	Zr	Hf	Ga	In	Sc	2.617	0.634	Be	Ca	Ti	Zr	Al	Al	Ga	In	3.049	0.978		
Be	Ba	Si	Sn	Al	Al	In	Y	1.529	0.634	Sr	Cd	Si	Zr	Ga	In	Sc	2.217	0.681	Ca	Sr	Ti	Hf	Ga	Ga	In	Sc	2.617	0.642	Be	Cd	Ti	Hf	Ga	Sc	Sc	Y	3.050	0.718		
Ba	Zn	Sn	Zr	Al	Ga	In	Y	1.529	0.577	Ba	Zn	Cd	Si	Ge	Ge	Ti	2.217	0.774	Mg	Mg	Sn	Zr	Al	Ga	Sc	Y	2.617	0.532	Be	Be	Si	Ge	Al	Ga	In	Y	3.050	0.713		
Sr	Sr	Si	Sn	Al	In	Sc	Y	1.529	0.567	Be	Ba	Ti	Ti	Al	Ga	In	2.217	0.665	Be	Zn	Ti	Zr	Ga	In	Y	Y	2.617	0.553	Mg	Mg	Sr	Zn	Si	Ge	Sn	Zr	3.050	0.760		
Ca	Ba	Sn	Hf	In	In	Sc	Y	1.530	0.389	Mg	Cd	Ge	Zr	Al	In	Y	2.217	1.024	Be	Sr	Ba	Cd	Si	Ge	Ti	Ti	2.617	0.536	Be	Cd	Si	Hf	Al	Sc	Y	Y	3.051	0.744		
Be	Ca	Ge	Sn	Al	In	Y	Y	1.530	0.372	Be	Ba	Si	Si	Al	Ga	In	Y	2.217	1.470	Be	Sr	Hf	Hf	Al	Ga	In	Y	2.617	0.641	Mg	Mg	Ti	Hf	Al	Ga	In	Y	3.051	0.879	
Mg	Cd	Ge	Sn	Al	In	Y	Y	1.530	0.323	Be	Zn	Sn	Zr	Ga	In	Y	2.218	1.298	Be	Mg	Si	Sn	Al	Al	In	Y	2.617	0.601	Be	Sr	Zn	Zn	Si	Ge	Sn	Ti	3.051	0.821		
Ca	Ba	Si	Sn	Al	Al	In	Y	1.531	0.662	Sr	Cd	Zr	Hf	In	In	Sc	Y	2.218	1.013	Ca	Ba	Zr	Hf	Ga	Ga	Sc	Y	2.617	0.685	Mg	Ca	Ba	Zn	Ge	Ge	Sn	Zr	3.051	0.807	
Be	Sr	Ge	Sn	Al	Ga	Y	Y	1.531	0.647	Ca	Ca	Zn	Cd	Ge	Sn	Ti	Zr	2.218	1.510	Mg	Sr	Ba	Zn	Si	Ge	Ge	Sn	2.617	0.656	Mg	Zn	Zr	Zr	Al	In	Sc	Y	3.051	0.924	
Ca	Zn	Si	Sn	Al	In	In	Sc	1.532	0.603	Ba	Cd	Ti	Ti	Al	Al	Ga	In	2.218	1.321	Be	Ca	Sn	Hf	Al	Al	Sc	Y	2.617	0.597	Ca	Sr	Ti	Hf	Al	Sc	Y	Y	3.051	0.846	
Mg	Zn	Ge	Sn	Ga	In	Y	Y	1.532	0.486	Sr	Zn	Ti	Hf	Al	In	Y	Y	2.218	0.843	Mg	Ba	Ge	Hf	Al	Sc	Sc	Y	2.617	0.635	Be	Mg	Sn	Ti	Al	Ga	Ga	Y	3.052	0.695	
Ca	Cd	Sn	Zr	Ga	Ga	In	Y	1.532	0.708	Sr	Zn	Cd	Cd	Ge	Sn	Ti	Zr	2.218	0.938	Mg	Ca	Ba	Cd	Cd	Sn	Sn	Ti	Zr	2.617	0.530	Mg	Ca	Sr	Cd	Si	Ti	Ti	Zr	3.052	0.688
Mg	Ba	Si	Ge	Al	In	In	Sc	1.532	0.693	Mg	Sr	Zn	Cd	Ge	Sn	Sn	Hf	2.218	0.891	Mg	Ba	Ba	Cd	Si	Ge	Ti	Zr	2.617	0.506	Be	Be	Ba	Zn	Si	Ti	Zr	Hf	3.052	0.717	
Ca	Cd	Ge	Hf	Al	In	In	Y	1.533	0.645	Be	Ca	Sr	Zr	Al	Al	In	Y	2.218	0.908	Ca	Sr	Ti	Zr	Al	Al	In	Y	2.617	0.616	Ca	Ca	Ba	Zn	Si	Ti	Zr	Sc	3.052	0.703	
Ca	Cd	Si	Sn	Al	In	Y	Y	1.533	0.520	Be	Ca	Ge	Ti	Ga	In	Y	Y	2.218	1.020	Mg	Sr	Ge	Hf	Ga	Sc	Y	Y	2.617	0.528	Be	Mg	Sr	Cd	Ge	Ti	Ti	Hf	3.052	0.710	
Be	Sr	Si	Ge	In	In	Sc	Y	1.533	0.507	Be	Ca	Sn	Hf	Al	Ga	Ga	Y	2.218	1.205	Zn	Cd	Ge	Hf	Ga	Sc	Y	Y	2.617	0.604	Be	Ca	Ba	Zn	Ge	Ge	Zr	Hf	3.052	0.848	
Ca	Ca	Si	Sn	Ga	In	Sc	Y	1.533	0.619	Ca	Sr	Ge	Zr	Al	In	Sc	Sc	2.218	1.603	Mg	Cd	Sn	Hf	In	Sc	Sc	Y	2.617	1.129	Be	Mg	Si	Ti	Zr	In	In	Y	3.053	0.992	
Ca	Zn	Ge	Ge	Al	Ga	In	Y	1.533	0.581	Be	Ba	Zn	Sn	Hf	Al	Sc	Y	Y	2.218	1.584	Be	Ba	Zr	Hf	Al	Sc	Y	Y	2.618	0.972	Be	Mg	Sr	Zn	Si	Si	Sn	Hf	3.053	0.875
Be	Ba	Sn	Ge	Sn	Ga	Sc	Y	1.534	0.574	Ca	Sr	Ge	Ti	Al	Al	Ga	Y	2.219	1.476	Be	Zn	Sn	Hf	Ga	In	Sc	Sc	2.618	0.823	Mg	Sr	Sr	Zn	Si	Ge	Sn	Ti	3.053	0.862	
Be	Cd	Sn	Sn	Al	Ga	In	Sc	1.534	0.624	Ba	Cd	Si	Ti	Ga	In	Sc	Sc	2.219	0.960	Mg	Ca	Zr	Hf	Al	In	In	Y	2.618	0.405	Be	Mg	Ca	Cd	Ge	Zr	Zr	Hf	3.053	0.752	
Sr	Ba	Si	Ge	Al	In	In	Sc	1.535	0.610	Sr	Ba	Ti	Zr	Ga	In	In	Y	2.219	1.386	Mg	Zn	Sn	Zr	Al	In	Sc	Sc	2.618	0.638	Mg	Sr	Zn	Cd	Si	Zr	Hf	Hf	3.053	0.793	
Ba	Ba	Sn	Zr	Al	Ga	In	Y	1.535	0.535	Mg	Ba	Si	Ge	Al	Ga	Y	Y	2.219	1.287	Be	Ba	Si	Hf	Ga	Sc	Sc	Y	2.618	0.496	Mg	Sr	Ti	Zr	Al	Sc	Sc	Y	3.053	0.783	
Ca	Cd	Sn	Hf	Ga	In	In	Sc	1.536	0.828	Mg	Ca	Sn	Ti	Al	Ga	Ga	In	2.219	0.937	Ca	Ca	Ba	Cd	Si	Sn	Ti	Zr	2.618	0.536	Be	Mg	Sr	Cd	Sn	Ti	Ti	Zr	3.054	0.796	
Sr	Ba	Sn	Zr	Al	Ga	Ga	Sc	1.536	0.816	Ca	Cd	Si	Ti	Ga	In	Y	Y	2.219	1.411	Ba	Zn	Zr	Hf	Al	Ga	Ga	Sc	2.618	0.658	Be	Sr	Ba	Zn	Ge	Ge	Ti	Hf	3.054	0.806	
Sr	Cd	Si	Ge	Ga	Ga	In	Sc	1.536	0.736	Ca	Cd	Ti	In	In	In	Y	Y	2.219	1.317	Ca	Sr	Ba	Cd	Ge	Ge	Sn	Ti	2.618	0.519	Be	Sr	Ba	Zn	Ge	Ge	Ti	Zr	3.054	0.796	
Ca	Ba	Si	Sn	Al	Al	Ga	Y	1.537	0.525	Ca	Ca	Zn	Ti	Ti	Al	Ga	Sc	Y	2.219	1.110	Be	Zn	Zr	Hf	Al	In	Y	Y	2.618	0.507	Ca	Zn	Zr	Hf	Al	Ga	Sc	Sc	3.054	0.783
Be	Sr	Sn	Hf	Ga	In	In	Y	1.537	0.915	Be	Ba	Si	Zr	Al	In	In	Sc	2.219	1.530	Be	Sr	Ge	Ti	Ga	Sc	Sc	Y	2.618	0.872	Be	Sr	Zn	Cd	Si	Ti	Hf	Hf	3.054	0.833	
Sr	Zn	Ge	Ti	Ga	In	In	Y	1.537	0.903	Ba	Zn	Ti	Zr	Al	In	In	Sc	2.219	1.282	Be	Ca	Cd	Cd	Ge	Sn	Ti	Hf	2.618	0.631	Mg	Ca	Zr	Hf	Al	Al	Ga	Y	3.054	0.880	
Sr	Si	Ge	Ga	In	Y	Y	1.538	0.810	Ba	Zn	Zr	Hf	Al	In	Y	Y	2.219	1.102	Sr	Sr	Ba	Cd	Cd	Ge	Ti	Zr	Hf	2.618	0.653	Mg	Ca	Sr	Cd	Si	Si	Ge	Hf	3.054	0.838	
Be	Ca	Si	Sn	Ga	In	Y	Y	1.538	0.582	Zn	Zn	Sn	Zr	Al	In	Sc	Y	2.220	1.572	Ca	Ba	Ti	Ti	Al	Ga	In	Sc	2.618	0.907	Ca	Zn	Si	Ti	Al	Al	Ga	Sc	3.054	0.960	
Zn	Cd	Ge	Sn	Al	Ga	Ga	Y	1.538	0.654	Be	Ba	Ti	Zr	Ga	In	In	Y	2.220	1.311	Ca	Ba	Zr	Hf	Al	Al	Ga	In	2.618	0.651	Mg	Mg	Si	Ti	Al	Al	Ga	In	Y	3.055	0.889
Sr	Cd	Ge	Hf	Ga	In	Y	Y	1.539	0.872	Ba	Cd	Si	Ge	Ga	Sc	Y	Y	2.220	0.927	Zn	Cd	Sn	Hf	Al	Al	Sc	Y	2.618	0.369	Be	Be	Mg	Cd	Sn	Ti	Zr	Hf	3.055	0.757	
Sr	Cd	Ge	Hf	Al	Ga	Ga	In	1.539	0.819	Mg	Ca	Ge	Zr	Al	Ga	In	In	2.220	1.019	Be	Ba	Ti	Hf	Al	Al	Ga	Ga	Y	2.618	0.302	Be	Sr	Ba	Zn	Si	Zr	Zr	Hf	3.055	0.740
Sr	Sr	Sn	Zr	Al	Ga	In	Y	1.540	0.810	Mg	Zn	Ge	Zr	Al	In	In	Y	2.220	0.907	Mg	Ba	Ti	Hf	Al	Ga	Sc	Y	Y	2.619	0.311	Mg	Zn	Ge	Zr	In	Sc	Sc	Y	3.055	0.759
Ca	Sr	Sn	Ti	Al	In	In	Y	1.540	0.798	Sr	Zn	Cd	Cd	Si	Ge	Zr	Hf	2.220	1.233	Ca	Sr	Sn	Ti	Al	Sc	Sc	Y	2.619	0.627	Mg	Ca	Zn	Cd	Si	Si	Ge	Zr	3.056	0.744	
Ba	Cd	Ge	Sn	Al	Al	Sc	Y	1.540	0.782	Ca	Ba	Si	Ti	Ga	In	In	Sc	2.220	1.633	Mg	Sr	Si	Zr	Al	Al	Ga	In	2.619	0.981	Mg	Ca	Zn	Cd	Si	Ti	Zr	Zr	3.056	0.880	
Ca	Sr	Sn	Ti	Ga	In	In	Y	1.541	0.733	Ca	Ba	Ti	Hf	Ga	In	In	Y	2.220	1.467	Be	Mg	Si	Ge	Al	In	Y	Y	2.619	0.865	Be	Sr	Ba	Zn	Si	Ti	Zr	Zr	3.056	0.821	
Mg	Ca	Ge	Sn	Al	Al	In	Y	1.541	1.029	Sr	Zn	Ge	Zr	Al	Al	Sc	Y	2.220	1.221	Ca	Zn	Ge	Hf	Ga	Sc	Y	Y	2.619	0.760	Zn	Cd	Si	Hf	Ga	Sc	Sc	Y	3.056	0.794	
Ca	Ba	Si	Sn	Ga	In	Sc	Sc	1.541	1.014	Mg	Ca	Ge	Ti	Ga	In	In	Sc	2.220	1.674	Be	Be	Sr	Zn	Si	Ge	Sn	Zr	2.619	1.007	Be	Ca	Zn	Cd	Si	Ge	Ge	Zr	3.056	0.900	
Mg	Sr	Si	Sn	Ga	In	Sc	Sc	1.541	0.964	Sr	Zn	Sn	Hf	Ga	Sc	Y	Y	2.220	1.490	Sr	Ba	Ge	Zr	Al	Sc	Sc	Y	2.619	0.874	Ca	Sr	Si	Zr	Al	Al	Sc	Sc	Y	3.056	0.822
Mg	Ba	Si	Sn	Al	In	Y	Y	1.543	0.789	Ca	Sr	Zn	Cd	Ge	Sn	Ti	Ti	2.220	1.084	Be	Cd	Si	Hf	Al	In	In	Sc	2.619	0.501	Sr	Sr	Ba	Zn	Si	Ti	Zr	Hf	3.057	0.729	
Be	Sr	Si	Sn	Al	In	Y	Y	1.544	1.162	Be																														

Ca	Sr	Si	Sn	Al	Al	Ga	In	1.570	0.835	Zn	Cd	Sn	Zr	Al	In	Sc	Sc	2.230	0.961	Mg	Zn	Sn	Zr	Al	Al	Ga	Y	2.630	0.523	Be	Ca	Zn	Cd	Ge	Ti	Zr	Zr	3.070	0.740		
Mg	Ba	Sn	HF	Ga	In	In	Sc	1.570	0.819	Ba	Zn	Si	Ti	Ga	Ga	Sc	Y	2.230	1.020	Be	Ca	Cd	Cd	Ge	Sn	Ti	Zr	2.630	0.549	Be	Mg	Si	Zr	Al	Ga	In	In	3.071	0.795		
Ba	Zn	Ge	Ti	In	In	Y	1.572	0.804	Ca	Cd	Si	Ti	Al	In	In	Sc	Y	2.230	1.158	Ca	Zn	Sn	HF	Al	Sc	Sc	Y	2.630	0.702	Be	Mg	Ca	Cd	Si	Si	Sn	Ti	3.071	0.932		
Mg	Sr	Ge	Ge	Al	Ga	In	Sc	1.572	0.758	Ca	Sr	Ge	HF	Al	Ga	Y	Y	2.230	1.024	Ca	Sr	Ge	Zr	In	Ga	Sc	Sc	Y	2.630	0.635	Sr	Sr	Ba	Zn	Ge	Ti	Zr	HF	3.072	0.864	
Sr	Zn	Si	Sn	Ga	Ga	Sc	Y	1.573	0.906	Ca	Sr	Zn	Cd	Si	Si	Sn	Zr	2.231	1.102	Ca	Ba	Zr	HF	In	Sc	Sc	Y	2.630	0.692	Be	Mg	Ba	Zn	Sn	Ti	HF	3.072	0.940			
Ba	Cd	Ge	Ti	In	In	In	Sc	1.573	0.893	Sr	Ba	Sn	HF	Ga	Sc	Sc	Y	2.231	1.246	Ca	Ba	Cd	Si	Ge	Sn	Ti	2.630	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	3.072	1.043			
Mg	Ba	Sn	HF	Al	In	In	Sc	1.573	0.834	Ca	Zn	Ge	Ti	Al	Ga	Y	Y	2.231	1.093	Ca	Sr	Zn	Cd	Sn	Ti	Ti	Zr	2.630	0.671	Mg	Cd	Zr	HF	Al	Sc	Y	Y	3.072	0.955		
Ba	Cd	Ge	Zr	Al	In	Y	Y	1.573	0.732	Mg	Ba	Zr	HF	In	In	Sc	Y	2.231	1.079	Ca	Ca	Sr	Cd	Si	Ge	Zr	HF	2.630	0.570	Be	Mg	Sr	Cd	Ge	Ti	Ti	Zr	3.072	0.722		
Zn	Cd	Ge	Ge	Al	Ga	In	Y	1.574	1.015	Be	Sr	Si	Ge	Al	Ga	Y	Y	2.231	1.115	Zn	Cd	Ti	Ti	Ga	In	Sc	Y	2.630	0.514	Mg	Ba	Ba	Zn	Sn	Ti	Zr	HF	3.072	0.702		
Ba	Cd	Si	Ge	Al	In	Y	Y	1.574	1.001	Be	Sr	Si	Si	Ga	In	Sc	Y	2.231	0.969	Ca	Sr	Ti	HF	Ga	Ga	Sc	Y	2.631	0.535	Sr	Cd	Si	Ti	Al	Sc	Sc	Y	3.072	0.827		
Sr	Cd	Si	Sn	Al	Al	In	Sc	1.575	0.930	Mg	Cd	Sn	Zr	Al	Ga	Ga	Y	2.231	1.133	Be	Ba	Ba	Zn	Si	Sn	Zr	HF	2.631	0.627	Mg	Mg	Ca	Cd	Si	Sn	Ti	HF	3.072	0.769		
Be	Sr	Sn	HF	Al	In	In	Y	1.575	0.809	Sr	Cd	Ba	Zr	HF	In	In	Sc	Y	2.231	1.187	Ca	Ba	Zr	HF	Al	In	Sc	Y	2.631	0.591	Mg	Sr	Sr	Cd	Si	Si	Ge	Zr	3.072	0.764	
Sr	Zn	Ge	Zr	Al	Ga	In	In	1.575	0.908	Be	Mg	Sn	Sn	Al	Ga	Sc	Y	2.232	1.229	Be	Ca	Ge	Zr	In	Sc	Sc	Y	2.631	0.739	Be	Zn	Sn	Ti	Ga	Sc	Sc	Y	3.073	1.006		
Mg	Sr	Si	Sn	Al	Al	Ga	In	1.575	0.860	Ca	Ca	Zn	Cd	Si	Ge	Sn	Ti	2.232	1.742	Be	Sr	Ba	Cd	Si	Zr	Zr	HF	2.631	0.831	Mg	Ca	Zr	HF	Al	Al	In	Sc	3.073	0.953		
Mg	Ca	Si	Sn	Ga	In	Y	Y	1.576	0.845	Sr	Cd	Si	Sn	Al	Ga	Sc	Y	2.232	1.727	Ca	Zn	Sn	Ti	Ga	Sc	Y	Y	2.631	0.699	Ca	Zn	Si	Zr	Ge	Sc	Sc	Y	3.073	0.863		
Mg	Ba	Si	Sn	Al	Al	Ga	Y	1.576	0.838	Be	Ca	Sn	Zr	Ga	In	Sc	Y	2.232	1.600	Mg	Sr	Zr	HF	In	Sc	Y	Y	2.631	0.648	Be	Zn	Cd	Cd	Zn	Ge	Sn	Ti	HF	3.073	0.812	
Sr	Cd	Ge	HF	Ga	Ga	In	Sc	1.576	0.783	Mg	Ba	Ge	Zr	Al	Al	In	Sc	2.232	1.119	Ca	Zn	Cd	Cd	Si	Ge	Ti	Zr	2.631	0.527	Be	Ba	Zn	Zn	Si	Ge	Zr	HF	3.073	0.800		
Ba	Zn	Sn	Zr	Ga	Ga	Sc	Y	1.576	0.766	Be	Sr	Zr	HF	Ga	In	Y	Y	2.232	1.534	Mg	Ca	Zn	Cd	Ge	Ge	Sn	Ti	2.632	0.561	Be	Be	Ba	Zn	Sn	Ti	Zr	HF	3.073	0.828		
Ca	Ba	Ge	Sn	In	Sc	Sc	Y	1.576	0.707	Be	Ba	Si	Zr	Ga	Ga	In	Y	2.232	1.415	Sr	Ba	Ti	HF	In	Sc	Sc	Y	2.632	0.516	Be	Be	Ge	HF	Al	Ga	Sc	Y	3.073	0.772		
Ca	Sr	Si	Sn	Al	Al	In	Y	1.576	0.884	Mg	Cd	Ge	Ti	Ga	In	Y	Y	2.232	1.095	Ca	Ca	Si	Ti	In	Al	In	Sc	Y	2.632	0.668	Mg	Ca	Zr	Cd	Si	Si	Ti	HF	3.074	0.924	
Ca	Cd	Si	Sn	Al	Ga	Ga	Y	1.577	0.869	Be	Sr	Ba	Cd	Sn	Sn	Zr	HF	2.232	1.565	Mg	Cd	Si	HF	Al	Ga	Y	Y	2.632	0.613	Be	Mg	Ge	Zr	Al	Ga	Ga	In	3.074	0.936		
Mg	Sr	Sn	HF	In	In	Ga	Y	1.577	0.798	Mg	Ca	Si	Ge	Ga	In	Sc	Y	2.232	1.449	Ca	Zn	Ti	HF	Ga	Ga	In	Sc	2.632	0.570	Be	Ca	Zr	Sn	Si	Sn	Ti	Ti	3.074	0.976		
Sr	Zn	Ge	Ti	Al	In	In	Y	1.578	0.719	Mg	Sr	Ge	Zr	Al	Ga	Ga	Sc	2.233	1.258	Ca	Cd	Si	HF	Al	Al	Ga	Sc	2.632	0.568	Be	Ca	Zr	Zr	Al	Ga	In	Sc	3.074	0.826		
Be	Cd	Ge	Sn	Al	In	In	Sc	1.579	0.986	Be	Ba	Ge	Zr	In	Sc	Y	Y	2.233	1.663	Ca	Zn	Si	Ti	Al	Ga	Ga	Sc	Y	2.633	0.715	Be	Ca	Zr	HF	Al	Al	Sc	Y	3.074	0.938	
Be	Zn	Ge	Sn	Ga	Ga	In	Y	1.580	0.971	Ba	Cd	Ti	Zr	Ga	Ga	In	Sc	2.233	1.406	Mg	Sr	Si	Zr	Al	Ga	Ga	Sc	2.633	0.624	Mg	Zn	Si	HF	Al	In	Sc	Sc	3.075	0.841		
Mg	Sr	Si	Ge	Ga	Ga	In	Y	1.580	0.887	Mg	Zn	Si	Sn	Al	Al	In	Y	2.233	1.249	Ba	Cd	Ge	Ti	Al	Sc	Y	Y	2.633	0.724	Be	Be	Zn	Cd	Ge	Ti	Zr	HF	3.075	0.963		
Zn	Cd	Sn	HF	Al	In	In	Y	1.580	0.791	Sr	Ba	Si	Ti	Al	Ga	Ga	Y	2.233	1.711	Be	Cd	Ge	HF	Al	Ga	Ga	Y	2.633	0.782	Be	Ca	Cd	Si	Ge	Ti	Zr	Y	3.075	1.062		
Sr	Zn	Sn	Ti	Ga	In	Y	Y	1.580	0.878	Sr	Cd	Ge	Ti	Al	Al	Ga	Sc	2.233	1.439	Ca	Sr	Ba	Cd	Sn	Ti	HF	HF	2.633	0.674	Mg	Mg	Ge	Ti	Al	Ga	Sc	Sc	3.075	0.942		
Be	Sr	Sn	Ti	Ga	In	In	Y	1.580	0.862	Zn	Cd	Sn	Ti	Al	Al	Ga	Sc	2.233	1.019	Be	Zn	Ge	Ti	In	In	Sc	Y	2.633	0.588	Mg	Ca	Ti	HF	Ga	Al	Sc	Sc	3.075	0.765		
Ca	Sr	Sn	HF	Al	In	In	Sc	1.581	0.837	Mg	Sr	Zn	Cd	Ge	Ga	Sn	Zr	2.234	1.116	Sr	Zn	Ti	Zr	Zr	Al	Al	Ga	In	2.634	0.530	Be	Ca	Zr	HF	Al	Al	In	Sc	3.075	0.761	
Sr	Zn	Sn	Zr	Al	Ga	Ga	Y	1.581	0.832	Be	Ca	Ge	HF	Al	In	In	Sc	2.234	1.049	Be	Cd	Sn	Zr	Al	Al	Ga	Ga	Sc	2.634	0.556	Ca	Ca	Sr	Zn	Si	Sn	Ti	HF	3.075	0.849	
Be	Ca	Sn	Sn	Al	Ga	Sc	Y	1.581	0.856	Mg	Ba	Ti	Zr	In	Ga	Sc	Y	2.234	1.371	Be	Mg	Sn	HF	In	Sc	Y	Y	2.634	0.570	Mg	Sr	Zn	Cd	Si	Ti	Ti	HF	3.076	0.835		
Be	Sr	Sn	Zr	Ga	Ga	In	Y	1.581	0.844	Ca	Zn	Ge	Ti	Al	Ga	Ga	Y	2.234	1.758	Be	Be	Ba	Cd	Cd	Si	Sn	Ti	HF	2.634	0.713	Ca	Sr	Ba	Zn	Si	Si	Zr	HF	3.076	0.936	
Sr	Cd	Sn	Ti	Ga	In	In	Sc	1.581	0.736	Sr	Zn	Ti	Zr	Ga	Ga	In	Y	2.234	1.603	Be	Mg	Ba	Cd	Cd	Sn	Zr	HF	2.634	0.649	Mg	Mg	Si	HF	Al	Ga	In	Sc	3.076	0.880		
Sr	Ba	Ge	Sn	Al	Ga	Sc	Sc	1.582	0.985	Sr	Cd	Sn	HF	Ga	Ga	Sc	Y	2.235	1.359	Mg	Ba	Si	HF	Al	Al	Ga	Ga	Sc	2.635	0.711	Mg	Mg	Zn	Zr	HF	Al	Ga	Ga	In	3.076	0.962
Be	Ca	Si	Sn	Ga	Ga	In	Y	1.582	0.973	Zn	Cd	Si	HF	Ga	In	Y	Y	2.235	1.804	Mg	Sr	Zr	HF	Ga	Ga	Sc	Sc	2.635	0.770	Mg	Mg	Sr	Zn	Cd	Si	Zr	Zr	HF	3.076	1.050	
Ba	Cd	Ge	Sn	In	Sc	Y	Y	1.582	0.855	Sr	Zn	Zr	HF	Ga	In	Y	Y	2.235	1.630	Mg	Ca	Si	Ge	In	Ga	Sc	Sc	Y	2.635	0.685	Zn	Cd	Zr	Si	Zr	Al	Sc	Y	Y	3.076	0.974
Ca	Zn	Sn	HF	Al	Al	Ga	In	1.583	0.646	Mg	Ca	Sn	HF	Al	Al	Ga	In	2.235	1.167	Mg	Sr	Ge	Zr	Ga	Ga	Sc	Sc	Y	2.635	0.595	Be	Mg	Sr	Zn	Si	Si	Sn	Zr	3.077	0.776	
Be	Sr	Si	Sn	Al	Ga	Ga	Y	1.583	0.976	Be	Ba	Sn	HF	Al	Sc	Y	Y	2.235	1.266	Be	Mg	Ba	Zn	Si	Sn	Sn	Zr	2.635	0.541	Be	Ca	Zn	Zn	Ge	Sn	Ti	HF	3.077	0.772		
Ca	Cd	Sn	Zr	In	In	Ga	Sc	1.583	0.964	Mg	Sr	Zn	Cd	Ge	Sn	HF	HF	2.235	1.260	Cd	Cd	Zr	HF	Al	Al	Ga	Sc	Y	2.635	0.558	Mg	Ca	Ti	Zr	Al	Al	Ga	Y	3.077	0.879	
Ba	Cd	Si	Ge	Al	Ga	Ga	Y	1.583	0.834	Ca	Zn	Ge	HF	Al	In	Sc	Sc	2.236	1.232	Cd	Cd	Si	Ge	Ga	Sc	Sc	Y	2.635	0.652	Be	Ca	Zn	Sn	Si	Sn	Zr	HF	3.077	0.815		
Sr	Ba	Ge	Sn	In	Sc	Sc	Y	1.584	0.606	Ca	Cd	Si	Sn	Ga	Sc	Sc	Y	2.236	1.348	Be	Cd	Sn	Ti	In	Sc	Sc	Sc	Y	2.635	0.617	Be	Mg	Zr	Zr	Ga	In	Sc	Y	3.077	0.825	
Ca	Zn	Sn	HF	Ga	Ga	In	Y	1.585	0.611	Mg	Cd	Si	HF	Al	Ga	In	In	2.236	1.558	Sr	Ba	Ge	HF	Ga	Sc	Y	Y	2.635	0.758	Be	Zn	Zr	HF	Ga	Ga	Sc	Y	3.077	1.036		
Sr	Cd	Sn	HF	Al	Al	In	Sc	1.585	0.935	Mg	Ca	Si	Sn	Ga	Sc	Sc	Y	2.236	1.241	Ca	Sr	Zn	Cd	Sn	Zr	HF	HF	2.635	1.414	Be	Zn	Ge	HF	Ga	Sc	Sc	Y	3.077	0.961		
Mg	Ba	Sn	HF	Al	Ga	In	In	1.585	0.891	Mg	Mg	Sn	HF	Al	Ga	In	Y	2.236	1.216	Ca	Ba	Ti	Zr	Zr	Al	Al	Ga	In	2.635	1											

Sr	Zn	Si	Ge	Al	In	In	Sc	1.610	0.731	Be	Sr	Ge	Ti	Ga	In	Sc	Sc	2.248	1.118	Ca	Cd	Ti	Ti	Al	In	Sc	Y	2.645	0.594	Mg	Mg	Ca	Cd	Ge	Sn	Ti	Hf	3.092	0.786		
Ba	Zn	Ge	Hf	Al	Al	In	Y	1.611	1.080	Be	Sr	Si	Ge	Ga	Sc	Y	Y	2.248	1.159	Ca	Ba	Ti	Zr	Ga	Ga	Sc	Y	2.645	0.547	Ca	Sr	Ba	Zn	Si	Si	Sn	Ti	3.092	0.780		
Ca	Cd	Sn	Hf	Al	In	Y	Y	1.611	1.068	Be	Sr	Si	Ti	Al	Ga	In	Y	2.248	1.079	Be	Mg	Ba	Cd	Ge	Ge	Sn	Ti	2.645	0.632	Be	Cd	Mg	Sr	Si	Ge	Sn	Zr	3.093	0.963		
Ca	Sr	Si	Ge	Al	In	In	Sc	1.611	0.930	Sr	Ba	Si	Zr	Al	Ga	In	In	2.249	1.170	Mg	Cd	Si	Ti	Al	In	In	Sc	2.645	0.654	Be	Zn	Cd	Cd	Ge	Sn	Ti	Zr	3.093	0.837		
Ca	Ba	Ge	Hf	Al	In	In	Y	1.612	0.688	Ca	Sr	Ge	Zr	Al	Al	Ga	Sc	2.249	1.229	Ba	Cd	Si	Zr	Ga	Sc	Y	Y	2.645	0.627	Be	Ba	Zn	Cd	Si	Ge	Zr	Hf	3.093	0.846		
Be	Ba	Sn	Zr	Ga	In	In	Sc	1.612	0.687	Sr	Zn	Ti	Hf	Ga	In	In	Sc	2.249	1.326	Be	Mg	Si	Ge	Al	Ga	In	In	2.645	0.826	Ca	Ba	Ba	Zn	Ge	Sn	Ti	Zr	3.094	1.136		
Be	Sr	Sn	Zr	In	In	Sc	Y	1.613	1.083	Mg	Ba	Si	Sn	Al	Sc	Y	Y	2.249	1.394	Be	Cd	Ge	Hf	Al	In	Sc	Sc	2.645	0.918	Ca	Ba	Si	Sn	Al	Sc	Y	Y	3.094	1.078		
Sr	Zn	Ge	Sn	Al	Ga	Sc	Sc	1.613	1.041	Mg	Sr	Si	Sn	Al	Sc	Sc	Y	2.249	1.362	Be	Ba	Si	Zr	Ga	Sc	Y	Y	2.645	0.794	Be	Mg	Ba	Zn	Si	Ge	Ge	Hf	3.095	0.997		
Sr	Cd	Ge	Hf	Al	Ga	Sc	Y	1.614	1.032	Mg	Ba	Ti	Zr	Ga	In	In	Y	2.249	1.254	Be	Sr	Ti	Hf	Al	Al	In	Y	2.645	0.725	Mg	Cd	Si	Ge	Al	Sc	Sc	Y	3.095	0.929		
Mg	Ba	Ge	Hf	Ga	In	In	Y	1.614	0.983	Mg	Cd	Ge	Sn	Ga	Sc	Y	Y	2.249	1.046	Be	Sr	Ge	Ti	Al	Ga	Sc	Sc	2.645	0.620	Mg	Sr	Ba	Zn	Si	Si	Sn	Zr	3.095	0.918		
Mg	Sr	Si	Sn	Al	In	Y	Y	1.614	0.968	Ca	Zn	Si	Ge	Al	Al	Ga	In	2.249	1.258	Mg	Sr	Ge	Ti	In	Sc	Y	Y	2.645	0.657	Be	Mg	Ge	Zr	Al	Ga	Ga	Y	3.095	0.962		
Ba	Cd	Sn	Zr	Ga	In	Sc	Sc	1.614	0.893	Sr	Zn	Ti	Zr	Al	Ga	In	2.249	1.159	Be	Sr	Si	Hf	Al	Al	In	Sc	2.645	0.593	Be	Ca	Zn	Cd	Ge	Zr	Zr	Hf	3.096	0.888			
Ca	Ba	Ge	Sn	Al	Ga	In	Sc	1.614	1.192	Mg	Zn	Ge	Ge	Al	Ga	In	Sc	2.249	1.093	Zn	Zn	Zr	Hf	Al	Ga	In	Y	2.645	0.758	Be	Zn	Zr	Hf	Al	Al	Ga	In	3.096	1.033		
Sr	Zn	Sn	Ti	Al	In	In	Sc	1.614	1.179	Mg	Ba	Ge	Sn	Al	Al	Ga	Y	2.249	1.316	Ca	Sr	Ba	Cd	Si	Ti	Hf	Hf	2.646	0.715	Mg	Ca	Zn	Cd	Si	Si	Ti	Hf	3.096	1.076		
Be	Ba	Si	Sn	In	Sc	Y	Y	1.614	1.097	Ba	Zn	Sr	Zr	Ga	Sc	Sc	Y	2.249	1.221	Be	Ca	Ge	Zr	Al	Al	In	Sc	2.646	0.653	Ca	Cd	Ti	Zr	Ga	Sc	Sc	Y	3.096	0.938		
Sr	Cd	Ge	Ti	Ga	In	In	Sc	1.615	0.919	Mg	Sr	Ge	Hf	Al	Ga	Y	Y	2.250	1.148	Ca	Cd	Ti	Hf	Al	Al	In	Sc	2.646	0.650	Be	Ca	Sr	Cd	Si	Si	Ge	Ti	3.097	0.925		
Be	Sr	Si	Ge	Ga	Ga	In	Y	1.616	1.267	Be	Ca	Sn	Zr	Ga	Ga	Sc	Y	2.250	1.374	Sr	Ba	Zr	Hf	Al	Al	Ga	Sc	2.646	0.793	Mg	Zn	Ti	Zr	Al	Ga	Ga	In	3.097	1.054		
Ba	Zn	Sn	Hf	Al	Al	Ga	Y	1.616	1.253	Mg	Ba	Ba	Zn	Cd	Ge	Sn	Sn	Ti	2.250	1.167	Mg	Cd	Zr	Hf	Ga	Ga	In	Y	2.646	0.693	Sr	Ba	Si	Zr	Zr	Al	Sc	Y	Y	3.097	0.948
Ba	Cd	Ge	Ti	Ga	In	Y	Y	1.616	1.165	Sr	Cd	Zr	Hf	Al	In	In	Sc	2.250	1.209	Sr	Zn	Si	Hf	In	Sc	Sc	Y	2.646	0.803	Zn	Cd	Ti	Hf	Al	Sc	Sc	Y	3.097	1.062		
Ca	Ba	Si	Ge	Al	Ga	In	In	1.617	0.977	Ba	Cd	Ge	Ti	Al	Al	Sc	Y	2.250	1.448	Be	Zn	Ge	Hf	Al	Al	In	Y	2.646	0.867	Mg	Zn	Cd	Cd	Si	Ge	Zr	Hf	3.098	1.185		
Be	Ba	Sn	Ti	Ga	In	In	Sc	1.617	1.006	Sr	Cd	Zr	Hf	Ga	In	In	Sc	2.250	1.227	Be	Mg	Ge	Sn	Al	Al	Ga	Y	2.647	0.748	Mg	Mg	Ca	Cd	Si	Sn	Ti	Zr	3.098	1.055		
Ba	Zn	Ge	Hf	Al	Ga	Ga	In	1.617	0.935	Mg	Cd	Ge	Ti	Ga	In	In	Sc	2.250	0.990	Sr	Ba	Si	Zr	Al	Al	Ga	Sc	2.647	0.616	Be	Cd	Zr	Hf	Al	Al	Ga	Y	3.098	0.818		
Sr	Ba	Ge	Zr	Al	In	In	Y	1.617	0.886	Be	Ba	Si	Ti	Ga	Ga	In	Y	2.250	1.039	Zn	Cd	Ge	Ti	Al	Al	Ga	Sc	2.647	0.567	Be	Ca	Zn	Zn	Si	Ge	Sn	Hf	3.098	0.829		
Ca	Ba	Sn	Zr	Al	Ga	Ga	Y	1.617	0.877	Ca	Zn	Ge	Ti	Al	Al	In	Y	2.251	1.021	Be	Sr	Ti	Hf	Al	In	Sc	Sc	2.647	0.636	Be	Zn	Ti	Hf	Al	Ga	Sn	In	3.098	0.954		
Ca	Zn	Si	Sn	Ga	Ga	In	Sc	1.617	0.789	Sr	Zn	Si	Ge	In	Sc	Y	Y	2.251	1.181	Mg	Ca	Ge	Hf	In	Sc	Y	Y	2.647	0.647	Be	Sr	Ba	Ba	Zn	Si	Ge	Ge	Hf	3.098	0.942	
Mg	Ca	Ge	Sn	Al	Al	Ga	In	1.617	0.774	Sr	Sr	Si	Hf	Al	Ga	In	Sc	2.251	1.392	Ca	Sr	Ti	Hf	Al	Ga	Ga	Sc	2.647	0.786	Be	Mg	Ba	Zn	Ge	Sn	Sn	Ti	3.099	1.052		
Sr	Ba	Sn	Ti	Al	In	In	Sc	1.617	0.701	Ca	Zn	Ge	Sn	Al	Sc	Y	Y	2.251	1.266	Mg	Ba	Si	Ge	Al	Sc	Y	Y	2.647	0.733	Be	Sr	Zn	Cd	Si	Si	Zr	Hf	3.099	1.004		
Be	Ba	Ge	Hf	Ga	In	In	Y	1.618	1.022	Sr	Ba	Ge	Zr	Al	Ga	Y	Y	2.251	1.237	Mg	Sr	Ti	Hf	Al	Al	In	Y	2.647	0.785	Be	Zn	Si	Hf	Al	Al	Ga	In	3.099	1.059		
Ba	Ba	Zn	Ge	Ge	Al	Ga	Sc	Y	1.618	1.007	Ca	Cd	Ge	Ti	Al	Ga	Sc	2.251	1.464	Ca	Sr	Ti	Zr	Ga	In	Sc	Sc	2.648	0.850	Be	Mg	Si	Hf	Al	In	In	Sc	3.100	1.172		
Mg	Cd	Ge	Sn	Al	Al	Ga	In	1.619	0.929	Sr	Zn	Ti	Zr	In	In	Sc	Y	2.251	1.320	Ca	Cd	Ge	Zr	Ga	Sc	Y	Y	2.648	0.776	Be	Ca	Si	Si	Al	Ga	Sc	Y	3.100	1.105		
Sr	Cd	Sn	Hf	Al	Al	Ga	Y	1.619	0.779	Ba	Ba	Cd	Ge	Zr	In	Sc	Y	2.251	1.085	Mg	Sr	Ba	Cd	Si	Si	Sn	Hf	2.649	0.618	Be	Zn	Si	Zr	Ga	Sc	Y	Y	3.100	0.827		
Ca	Ca	Ge	Sn	Al	Ga	Sc	Y	1.619	1.092	Ba	Ba	Ge	Ti	Al	Ga	Sc	Y	2.252	1.105	Mg	Sr	Si	Zr	Al	Al	Ga	Y	2.649	0.573	Mg	Zn	Ge	Hf	Ga	Sc	Sc	Y	3.100	0.837		
Ba	Ba	Si	Ge	Al	Ga	In	Y	1.619	1.072	Cd	Cd	Ge	Zr	Al	Ga	Sc	Y	2.252	1.125	Ca	Ba	Zn	Cd	Si	Ti	Ti	Hf	2.649	0.653	Be	Cd	Ge	Ti	Ga	Sc	Sc	Y	3.100	1.002		
Sr	Ba	Sn	Zr	Ga	Ga	In	Y	1.620	0.988	Mg	Ba	Ba	Zn	Cd	Sn	Sn	Ti	Hf	2.252	1.098	Sr	Ba	Ge	Ti	Ga	Sc	Sc	Y	2.649	0.677	Ca	Sr	Sr	Zn	Si	Ge	Ti	Hf	3.100	0.870	
Mg	Zn	Ge	Sn	In	In	Sc	Y	1.620	0.827	Be	Sr	Zr	Hf	In	In	Sc	Y	2.252	1.166	Ca	Ba	Si	Si	Al	Ga	Sc	Y	2.649	0.651	Mg	Zn	Zr	Hf	Ga	Ga	Sc	Y	3.100	0.895		
Mg	Ba	Sn	Zr	Ga	In	In	Sc	1.620	0.846	Ca	Cd	Ge	Ti	Ga	In	Sc	Sc	2.253	1.366	Ca	Cd	Si	Ti	Al	Al	In	Sc	2.649	0.843	Be	Mg	Sr	Zn	Si	Sn	Zr	Zr	3.100	1.153		
Sr	Ba	Sn	Ti	Al	Ga	Ga	Y	1.620	0.974	Mg	Ca	Ge	Sn	Al	Sc	Sc	Y	2.253	1.322	Zn	Cd	Zr	Zr	Ti	Al	In	Sc	Y	2.649	1.078	Be	Cd	Si	Hf	Al	Al	Ga	Y	3.100	1.084	
Ba	Zn	Si	Hf	Al	In	In	Y	1.620	0.934	Sr	Zn	Si	Hf	Al	Ga	Ga	Sc	2.253	1.287	Ba	Zn	Si	Ti	Al	Al	Sc	Y	2.649	0.936	Be	Sr	Zn	Cd	Ge	Ti	Ti	Hf	3.101	1.005		
Ca	Sr	Sn	Zr	In	In	Sc	Y	1.620	0.926	Ba	Zn	Ti	Hf	Al	Al	In	Y	2.253	1.211	Ca	Cd	Ge	Hf	Ga	Sc	Sc	Y	2.649	0.818	Mg	Ca	Zn	Zn	Si	Ge	Zr	Hf	3.101	0.941		
Mg	Ba	Si	Ge	Al	Ga	Ga	In	1.620	0.967	Ca	Sr	Sn	Zr	In	Sc	Sc	Y	2.253	1.137	Mg	Ba	Ti	Zr	Al	Al	Ga	In	2.649	0.632	Be	Cd	Ge	Ti	Al	Al	Sc	Y	3.101	0.937		
Ca	Cd	Sn	Zr	In	In	Sc	Y	1.621	0.952	Mg	Ba	Si	Ge	Ga	Sc	Sc	Y	2.253	1.246	Be	Cd	Si	Hf	Al	Ga	Y	Y	2.650	0.723	Mg	Zn	Ti	Zr	Ga	Ga	In	Sc	3.101	0.978		
Ca	Sr	Sn	Hf	Ga	In	In	Sc	1.621	0.836	Ca	Cd	Ge	Hf	Al	Al	Ga	Sc	2.253	1.178	Mg	Sr	Sn	Ti	Al	Al	Sc	Sc	Y	2.650	0.610	Be	Sr	Sr	Zn	Sn	Ti	Zr	Hf	3.101	0.907	
Ba	Ba	Sn	Ti	Al	Ga	In	Y	1.621	1.084	Sr	Zn	Zn	Cd	Si	Ge	Zr	Hf	2.253	1.207	Be	Sr	Ti	Hf	Ga	Ga	In	Sc	2.650	0.768	Ca	Zn	Ge	Ti	Al	Sc	Sc	Y	3.101	1.049		
Ba	Ba	Sn	Hf	Al	Ga	In	Sc	1.621	1.070	Ba	Cd	Ti	Zr	Al	Ga	Ga	Y	2.253	1.316	Ca	Sr	Hf	Hf	Al	Ga	In	Sc	2.650	0.764	Be	Mg	Ge	Hf	Al	Sc	Y	Y	3.101	1.092		
Ba	Ba	Zn	Sn	Ti	Ga	Ga	In	Sc	1.621	0.944	Ca	Sr	Ti	Hf	Ga	In	In	Y	2.253	1.251	Be	Ba	Hf	Hf	Al	Ga	In	Sc	2.650	0.654	Zn	Cd	Zr	Ti	In	Sc	Sc	Y	3.101	1.017	
Ca	Cd	Si																																							

Sc	Cd	Ge	Ti	Al	In	In	Sc	1.641	1.150	Ca	Sr	Si	Zr	Ga	Ga	In	Y	2.264	1.080	Be	Ca	Ba	Cd	Si	Ge	Zr	Zr	2.658	0.728	Be	Ca	Zn	Zn	Si	Ge	Sn	Zr	3.117	1.150	
Ca	Cd	Sn	Hf	Ga	Ga	In	Sc	1.642	1.144	Cd	Sr	Si	Sn	Al	Sc	Sc	Y	2.264	1.046	Mg	Ba	Zr	Hf	Ga	Ga	In	Sc	2.658	0.686	Mg	Cd	Si	Ti	In	Sc	Y	Y	3.118	1.078	
Ca	Zn	Si	Sn	Ga	In	In	Y	1.642	1.177	Ca	Sr	Si	Hf	Al	Ga	In	In	2.264	0.968	Mg	Ca	Zn	Cd	Si	Ge	Hf	Hf	2.658	0.558	Be	Sr	Ba	Zn	Si	Ge	Ge	Hf	3.118	1.064	
Ca	Zn	Sn	Ti	Ga	In	In	Y	1.642	1.164	Ca	Sr	Ge	Ti	Al	Al	Ga	In	2.264	1.038	Mg	Zn	Si	Ge	Al	Ga	Ga	Y	2.658	0.572	Be	Mg	Sr	Zn	Zr	Al	Ge	Sn	Ti	3.118	1.116
Sc	Cd	Ge	Zr	Ga	Ga	In	Sc	1.643	1.037	Mg	Zn	Si	Sn	Ga	In	Sc	Sc	2.264	1.016	Mg	Zn	Zn	Cd	Si	Si	Sn	Hf	2.659	0.540	Be	Cd	Si	Zr	Al	Ge	Sc	Y	Y	3.118	1.039
Mg	Ba	Ge	Hf	Al	In	In	Sc	1.643	1.263	Sr	Cd	Sn	Ti	In	Sc	Y	Y	2.264	1.040	Sr	Zn	Zr	Hf	Al	Al	Al	Y	2.659	0.681	Ca	Cd	Ti	Zr	Al	Sc	Sc	Y	Y	3.118	1.155
Ca	Ba	Ge	Ga	In	Ga	In	Sc	1.643	1.251	Be	Zn	Sn	Hf	In	Sc	Y	Y	2.264	1.078	Be	Zn	Sn	Ti	Al	Al	In	Y	2.659	0.583	Mg	Mg	Ca	Cd	Ge	Sn	Ti	Zr	3.118	1.218	
Ca	Ba	Si	Ge	Al	Ga	In	Sc	1.644	1.112	Sr	Cd	Ti	Hf	Al	Al	In	Y	2.264	1.062	Mg	Ca	Si	Ge	Al	Al	Ga	Sc	2.659	0.557	Ca	Zn	Si	Zr	Al	Sc	Sc	Y	Y	3.118	1.136
Ca	Ba	Sn	Zr	Ga	In	Ga	In	1.644	0.891	Be	Ba	Si	Ti	Al	In	In	Sc	2.265	1.058	Be	Cd	Si	Ti	In	In	Sc	Y	2.659	0.580	Be	Sr	Si	Zr	Al	Sc	Sc	Y	3.118	1.069	
Ca	Cd	Si	Ge	Al	In	Y	Y	1.644	1.227	Ca	Sr	Si	Ge	Ga	Sc	Sc	Y	2.265	1.175	Ca	Sr	Zn	Cd	Ge	Ti	Ti	Hf	2.659	0.742	Be	Be	Si	Ge	Al	In	Sc	Y	3.119	1.197	
Ca	Zn	Ge	Hf	Al	In	In	Y	1.644	1.215	Ca	Ba	Si	Hf	Al	Ga	Ga	In	2.265	1.058	Ca	Sr	Sc	Cd	Si	Ge	Ti	Hf	2.659	0.675	Be	Mg	Zn	Cd	Sn	Zr	Hf	Hf	3.119	1.098	
Zn	Cd	Ge	Hf	Al	Ga	Ga	In	1.645	1.064	Be	Ca	Sn	Hf	In	Sc	Y	Y	2.265	1.144	Mg	Zn	Ti	Hf	Ga	In	In	Y	2.659	0.728	Mg	Sr	Ba	Zn	Sn	Ti	Hf	Hf	3.119	1.172	
Be	Ca	Si	Ge	Ga	In	In	Y	1.645	0.824	Ca	Zn	Ge	Zr	Al	Ga	Ga	Sc	2.265	1.230	Be	Sr	Si	Hf	Al	Al	Ga	Y	2.659	0.768	Be	Zn	Ti	Zr	Al	Sc	Sc	Y	3.119	1.315	
Ba	Cd	Sn	Hf	Al	Ga	Ga	Sc	1.645	0.811	Ca	Cd	Ti	Zr	Al	Ga	In	In	2.265	1.100	Be	Ba	Si	Ti	Al	Ga	Ga	Sc	2.659	0.687	Be	Sr	Zn	Zr	Ge	Ti	Zr	Hf	3.119	1.193	
Be	Zn	Ge	Sn	Ga	In	Y	Y	1.645	1.116	Ba	Cd	Zr	Hf	Al	Al	In	Y	2.266	1.090	Be	Ca	Si	Ti	Ga	Ga	In	Y	2.659	0.622	Be	Mg	Ge	Ti	Ga	Ga	Sc	Y	3.119	0.912	
Sr	Cd	Ge	Hf	Al	Al	In	Y	1.645	1.074	Sr	Cd	Ti	Hf	Ga	Ga	In	Sc	2.266	1.090	Mg	Sr	Ge	Ti	Al	Ga	Ga	Sc	2.659	0.542	Be	Mg	Ca	Cd	Sn	Ti	Zr	Zr	3.119	0.932	
Zn	Cd	Si	Ge	Al	In	In	Y	1.646	1.066	Be	Zn	Sn	Hf	In	In	Sc	Y	2.266	1.004	Mg	Zn	Sn	Hf	Al	Ga	Ga	Sc	2.660	0.565	Be	Zn	Ge	Ti	Al	Ga	Ga	Y	3.119	1.084	
Be	Ba	Si	Ge	Al	Ga	Ga	In	1.647	1.009	Ba	Zn	Sn	Hf	Al	Sc	Sc	Y	2.266	1.074	Sr	Zn	Zr	Hf	Al	Al	Ga	In	2.660	0.576	Be	Mg	Sr	Ba	Si	Ge	Ge	Sn	3.120	1.063	
Ca	Cd	Si	Ge	Al	In	Ga	Sc	1.647	0.995	Zn	Cd	Sn	Ti	Ga	Ga	Sc	Y	2.266	1.177	Be	Cd	Zr	Hf	Ga	Sc	Y	Y	2.660	0.721	Be	Zn	Ge	Ti	Al	Al	In	Sc	3.120	1.181	
Sr	Ba	Sn	Hf	Al	Al	Ga	Y	1.647	0.915	Sr	Ba	Sn	Ti	In	Sc	Sc	Y	2.266	1.062	Ca	Zn	Zr	Hf	Al	Al	In	Y	2.660	0.667	Be	Zn	Hf	Hf	Al	Ga	In	Sc	3.120	1.145	
Sr	Ba	Si	Sn	Al	Al	In	Sc	1.647	1.207	Ba	Ba	Zn	Cd	Sn	Ti	Zr	Hf	2.267	1.155	Ba	Cd	Ge	Ti	Al	Sc	Sc	Y	2.660	0.701	Be	Mg	Ca	Cd	Si	Ge	Hf	Hf	3.120	1.157	
Mg	Zn	Sn	Sn	Al	Al	In	Sc	1.647	1.194	Cd	Cd	Si	Ti	Al	Ga	In	Y	2.267	1.230	Be	Ca	Ge	Zr	Al	Al	Ga	Y	2.660	0.739	Be	Mg	Ge	Zr	Al	In	Sc	Sc	3.120	1.289	
Ca	Cd	Ge	Hf	Ga	Ga	In	Y	1.648	1.105	Mg	Ba	Ge	Ti	Ga	Ga	Sc	Y	2.268	1.096	Be	Ca	Ba	Cd	Si	Si	Sn	Hf	2.660	0.664	Be	Mg	Ba	Zn	Si	Ge	Ge	Zr	3.120	1.233	
Sr	Ba	Sn	Ti	In	In	Sc	Y	1.648	0.945	Be	Ca	Ba	Zn	Si	Ge	Sn	Sn	2.268	1.137	Ca	Zn	Ti	Zr	Al	Al	In	Y	2.660	0.617	Zn	Cd	Si	Zr	Ga	Sc	Sc	Y	3.120	0.908	
Ca	Zn	Ge	Sn	Al	Ga	Ga	Sc	1.648	1.265	Be	Cd	Si	Sn	Al	Ga	Ga	Y	2.268	1.138	Be	Ca	Sr	Cd	Ge	Ge	Sn	Ti	2.660	0.540	Be	Zn	Zr	Hf	Ga	Ga	In	Sc	3.120	0.928	
Ba	Zn	Ge	Sn	In	Ga	Sc	Y	1.648	1.251	Ca	Sr	Si	Si	Ga	In	Sc	Y	2.268	1.005	Ca	Ba	Ge	Hf	Ga	Sc	Y	Y	2.660	0.534	Be	Mg	Ba	Cd	Si	Si	Ti	Zr	3.120	1.122	
Sr	Ba	Sn	Ti	Ga	In	In	Sc	1.648	1.156	Be	Ba	Si	Zr	Al	In	Y	Y	2.268	1.159	Zn	Cd	Si	Hf	Ga	In	Sc	Sc	2.660	0.632	Ca	Zn	Ti	Hf	Al	Sc	Sc	Y	3.120	0.938	
Be	Ba	Sn	Hf	Al	In	Y	Y	1.648	0.986	Ca	Ba	Zr	Hf	In	In	Sc	Y	2.269	1.177	Mg	Sr	Si	Ge	In	Al	Sc	Sc	Y	2.660	0.573	Be	Mg	Zn	Cd	Sn	Ti	Hf	Hf	3.120	0.973
Ca	Zn	Sn	Zr	Al	Ga	In	In	1.648	1.010	Sr	Ba	Si	Hf	Al	Al	Ga	Y	2.269	1.215	Mg	Ca	Ge	Ti	Al	Ga	Ga	Sc	2.660	0.683	Be	Be	Zr	Hf	Ga	In	Sc	Y	3.121	1.248	
Sr	Zn	Ge	Sn	Al	Al	Ga	Sc	1.649	1.041	Ba	Ba	Zn	Cd	Sn	Ti	Zr	Hf	2.269	1.166	Mg	Ca	Ge	Hf	Al	Ga	Ga	Sc	2.660	0.889	Mg	Mg	Sr	Cd	Si	Ge	Ti	Hf	3.121	1.013	
Be	Sr	Si	Sn	Al	Al	In	Y	1.649	0.998	Sr	Zn	Si	Hf	Al	Al	In	Sc	2.269	1.088	Mg	Ba	Zn	Cd	Si	Ge	Ge	Zr	2.661	0.733	Be	Ca	Ti	Hf	Al	Sc	Sc	Y	3.121	0.900	
Ca	Cd	Sn	Hf	Al	Ga	In	Sc	1.649	0.990	Mg	Sr	Si	Hf	Ga	Ga	In	Y	2.269	1.061	Ca	Ba	Zn	Cd	Ti	Ti	Zr	Hf	2.661	0.696	Mg	Ca	Zr	Hf	Al	Al	Sc	Y	3.121	0.867	
Be	Sr	Si	Ge	Ga	In	Y	Y	1.649	0.919	Mg	Ba	Cd	Cd	Ge	Sn	Ti	Zr	2.269	1.002	Be	Cd	Ge	Ti	Al	In	Y	Y	2.661	0.581	Mg	Ca	Sr	Zn	Ge	Ge	Sn	Zr	3.121	0.824	
Sr	Sr	Sn	Hf	Ga	In	In	Sc	1.650	0.904	Be	Sr	Ti	Zr	Ga	In	Y	Y	2.269	1.042	Be	Ba	Ti	Zr	Al	Ga	Ga	Y	2.661	0.587	Be	Sr	Zn	Cd	Si	Zr	Hf	Hf	3.121	0.845	
Ca	Sr	Ge	Hf	Ga	In	In	Y	1.650	0.826	Be	Cd	Sn	Ti	Al	Ga	Ga	In	2.269	1.028	Be	Ba	Si	Hf	Al	Ga	Ga	Sc	2.661	0.560	Be	Ca	Zr	Hf	Al	Al	Ga	Y	3.121	0.811	
Mg	Sr	Si	Sn	Ga	Ga	Sc	Y	1.650	1.126	Be	Sr	Ba	Cd	Ge	Sn	Zr	Zr	2.269	1.071	Ca	Cd	Zr	Hf	Al	Al	Ga	In	2.661	0.702	Mg	Ca	Sr	Zn	Sn	Sn	Ti	Hf	3.122	0.917	
Zn	Cd	Si	Sn	Ga	Al	In	Y	1.650	1.112	Sr	Ba	Si	Si	Al	Ga	In	Sc	2.270	1.061	Be	Be	Ba	Cd	Si	Sn	Ti	Zr	2.661	0.599	Mg	Sr	Zn	Zn	Si	Ge	Ti	Hf	3.122	0.907	
Ca	Zn	Si	Ge	Al	In	In	Y	1.650	1.025	Be	Sr	Ge	Hf	In	Sc	Y	Y	2.270	1.054	Ca	Sr	Ba	Cd	Ge	Ge	Ti	Hf	2.661	0.577	Be	Zn	Zr	Hf	Ga	In	Sc	Sc	3.122	0.871	
Sr	Ba	Ge	Zr	Ga	In	In	Y	1.650	0.876	Be	Ca	Sn	Hf	Al	In	Sc	Sc	2.270	1.084	Ca	Zn	Ti	Ti	Ga	In	Sc	Y	2.661	0.610	Mg	Cd	Si	Zr	Al	Ga	Ga	Sc	3.122	0.849	
Sr	Cd	Ge	Sn	In	Sc	Y	Y	1.651	1.183	Mg	Ba	Ba	Cd	Ge	Sn	Zr	Hf	2.270	1.185	Be	Sr	Sr	Cd	Sn	Ti	Zr	Hf	2.661	0.752	Be	Ba	Zn	Cd	Si	Si	Ge	Hf	3.122	0.976	
Ba	Zn	Si	Sn	Al	In	Sc	Sc	1.651	1.169	Ca	Cd	Zr	Hf	Ga	Ga	In	Y	2.271	1.086	Be	Sr	Si	Hf	Al	Al	Ga	Ga	Sc	2.662	0.694	Zn	Cd	Ge	Ti	Al	Sc	Sc	Y	3.123	0.903
Zn	Cd	Sn	Zr	Ga	In	In	Y	1.651	1.076	Be	Cd	Ge	Hf	Ga	In	In	Sc	2.271	1.166	Mg	Zn	Si	Zr	In	In	Sc	Y	2.662	0.746	Mg	Mg	Zr	Hf	Al	In	Sc	Y	3.123	0.953	
Ca	Zn	Sn	Zr	Ga	Ga	In	Y	1.652	0.916	Sr	Zn	Si	Ge	Al	Ga	Ga	Sc	2.271	1.219	Sr	Ba	Zr	Hf	In	Sc	Y	Y	2.662	0.780	Mg	Zn	Si	Zr	In	Sc	Y	Y	3.123	1.053	
Ba	Zn	Sn	Ti	Al	Ga	Ga	In	1.652	0.941	Ca	Sr	Ti	Hf	In	In	Sc	Y	2.271	1.108	Be	Cd	Ge	Ti	Al	Al	Ga	In	2.662	0.705	Be	Be	Ca	Cd	Si	Ge	Ti	Zr	3.123	0.960	
Be	Ba	Ge	Hf	In	In	Sc	Y	1.652	1.123	Be	Sr	Ge	Ti	Al	Ga	Ga	Y	2.271	1.129	Mg	Ba	Ti	Zr	In	Sc	Sc	Y	2.662	0.648	Be	Zn	Zn	Cd	Ge	Sn	Ti	Zr			

Sr	Cd	Ge	Ti	In	In	Sc	Y	1.674	0.919	Sr	Ba	Cd	Cd	Sn	Ti	Zr	Hf	2.281	1.100	Ca	Sr	Ti	Ti	Al	Ga	In	Sc	2.671	0.944	Be	Ca	Si	Zr	Al	Ga	Sc	Sc	3.139	0.902	
Sr	Ba	Si	Sn	Al	In	Sc	Y	1.674	0.741	Be	Mg	Ba	Cd	Si	Sn	Sn	Zr	2.281	0.955	Ca	Zn	Si	Ge	Al	Al	Sc	Y	2.671	0.789	Mg	Sr	Ba	Zn	Ge	Zr	Hf	Hf	3.139	0.860	
Be	Sr	Sn	Ti	In	In	Sc	Y	1.674	1.041	Ca	Mg	Si	Hf	Al	Ga	In	Y	2.281	1.228	Zn	Cd	Ge	Zr	Al	Al	Sc	Y	2.671	1.079	Mg	Sr	Ba	Zn	Sn	Zr	Hf	Hf	3.140	1.121	
Be	Ba	Si	Sn	Al	Ga	In	Sc	1.674	1.027	Mg	Ba	Zn	Si	Hf	Al	Ga	Sc	2.281	1.028	Zn	Zn	Si	Hf	Al	Ga	In	Sc	2.671	0.868	Mg	Zn	Zn	Cd	Si	Ge	Zr	Hf	3.140	0.936	
Mg	Ba	Sn	Hf	Al	Ga	Y	Y	1.675	0.889	Mg	Ca	Ge	Zr	Al	In	Y	Y	2.281	0.996	Zn	Cd	Zr	Zr	Al	Ga	In	Sc	2.671	0.722	Ca	Sr	Ba	Zn	Ge	Zr	Hf	Hf	3.140	0.975	
Sr	Ca	Si	Sn	Al	In	Sc	Sc	1.675	0.691	Be	Sr	Ge	Hf	Al	Ga	Ga	Sc	2.281	1.304	Be	Zn	Ge	Hf	Al	Ga	Ga	In	2.671	1.122	Be	Sr	Ba	Zn	Sn	Ti	Zr	Zr	3.140	1.198	
Ca	Ca	Si	Sn	Al	Ga	In	Sc	1.675	0.704	Zn	Cd	Si	Hf	Ga	Ga	In	Y	2.281	1.090	Be	Zn	Si	Zr	Ga	In	In	Y	2.671	0.890	Be	Ca	Zn	Cd	Sn	Ti	Ti	Zr	3.140	0.993	
Mg	Ba	Sn	Zr	Al	In	In	Sc	1.676	0.704	Ca	Zn	Si	Ti	Ge	Ga	In	Y	2.281	0.886	Mg	Zn	Si	Ti	Al	In	In	Y	2.671	0.542	Mg	Cd	Ti	Al	Ga	Sc	Y	Y	3.141	0.706	
Be	Ba	Sn	Zr	Ga	Ga	In	Y	1.676	0.705	Be	Sr	Ba	Cd	Ge	Sn	Sn	Ti	2.282	0.955	Mg	Cd	Si	Ti	Al	In	Y	Y	2.671	0.675	Be	Ca	Ba	Zn	Si	Ti	Hf	Hf	3.141	0.689	
Ca	Sr	Sn	Zr	Ga	In	In	Sc	1.676	0.703	Ca	Zn	Si	Si	Al	Ga	In	Y	2.282	0.836	Be	Ca	Si	Ti	Al	Ga	In	In	2.671	0.612	Ca	Sr	Ba	Zn	Ge	Ti	Zr	Zr	3.141	0.748	
Ba	Zn	Ge	Zr	Al	Ga	Y	Y	1.676	0.655	Mg	Zn	Sn	Hf	Al	Ga	Ga	In	2.282	1.004	Be	Ca	Si	Si	Al	Ga	In	Y	2.671	0.845	Mg	Mg	Ba	Zn	Si	Ge	Sn	Ti	3.141	0.959	
Mg	Ba	Ge	Ti	Ga	In	In	Y	1.677	0.647	Sr	Ba	Si	Ge	Al	Ga	Sc	Sc	2.282	1.261	Mg	Ba	Ti	Zr	In	Sc	Y	Y	2.671	1.106	Be	Cd	Zr	Hf	Al	Ga	Sc	Sc	3.141	1.202	
Ca	Ba	Sn	Ti	Ga	In	In	Sc	1.677	0.632	Ca	Sr	Ge	Ti	Ga	In	Sc	Sc	2.282	1.104	Mg	Zn	Ge	Hf	Ga	In	Sc	Sc	2.672	0.952	Be	Zn	Si	Si	Al	In	Sc	Y	3.141	1.111	
Ca	Cd	Si	Sn	Ga	Ga	Sc	Y	1.677	0.859	Sr	Cd	Si	Zr	Al	Al	Ga	Y	2.282	1.043	Be	Ba	Zr	Zr	Al	Ga	Sc	Y	2.672	0.782	Be	Mg	Ca	Cd	Ge	Ti	Zr	Zr	3.142	1.067	
Ba	Zn	Sn	Zr	Al	Al	Al	Sc	1.677	0.851	Ca	Ba	Ge	Ti	Ga	Ga	Sc	Y	2.282	1.336	Mg	Ba	Si	Ti	Al	In	Sc	Sc	2.672	1.148	Mg	Zn	Ti	Ti	Al	In	Sc	Y	3.142	1.271	
Mg	Ca	Ge	Sn	Al	Al	Ga	Y	1.678	0.828	Be	Sr	Ba	Cd	Si	Sn	Hf	Hf	2.282	1.160	Mg	Ba	Ge	Ti	Al	Al	Sc	Y	2.672	0.973	Mg	Cd	Si	Ti	Al	Ga	Ga	Sc	3.142	1.162	
Mg	Ba	Si	Ge	Ga	In	Y	Y	1.678	0.832	Mg	Cd	Ge	Hf	Al	Ga	Y	Y	2.282	0.970	Mg	Zn	Sn	Zr	In	Sc	Y	Y	2.672	0.635	Mg	Zn	Si	Ge	Al	Al	Sc	Y	3.143	0.815	
Be	Sr	Sn	Hf	Ga	In	In	Sc	1.678	0.884	Be	Sr	Ti	Hf	Ga	In	In	Y	2.283	1.040	Be	Zn	Sn	Zr	Al	Al	In	Sc	2.672	0.762	Be	Be	Si	Hf	Al	Ga	In	Y	3.143	0.798	
Ca	Cd	Sn	Zr	Al	In	Y	Y	1.678	0.874	Ca	Ba	Ge	Hf	Al	Ga	Sc	Sc	2.283	0.918	Mg	Ca	Ge	Ti	Al	Al	Ga	In	2.672	0.723	Mg	Sr	Ba	Zn	Si	Si	Zr	Hf	3.143	0.930	
Sr	Zn	Ge	Hf	Ga	Ga	In	Sc	1.678	0.843	Ca	Cd	Si	Hf	Al	Ga	Y	Y	2.283	1.028	Mg	Ca	Sr	Cd	Ge	Ge	Sn	Hf	2.672	0.668	Mg	Zn	Ti	Hf	Al	Ga	Ga	In	3.143	0.885	
Ba	Cd	Sn	Ti	Al	Al	Ga	In	1.678	0.830	Sr	Cd	Ti	Zr	Al	Ga	Ga	In	2.283	1.116	Ca	Zn	Zn	Cd	Sn	Ti	Zr	Hf	2.672	0.809	Ca	Zn	Si	Hf	Al	Sc	Sc	Y	3.143	0.883	
Ba	Cd	Si	Hf	Ga	Ga	In	Y	1.678	0.915	Sr	Cd	Ti	Hf	Al	Ga	Y	Y	2.283	1.206	Ca	Cd	Si	Zr	Al	Ga	Sc	Sc	2.672	0.974	Be	Cd	Ti	Zr	Al	Ga	Ga	Y	3.143	1.155	
Ca	Zn	Ge	Sn	Al	Al	In	Sc	1.678	0.602	Be	Cd	Ge	Sn	Al	Ga	Sc	Sc	2.284	1.167	Ca	Ca	Sr	Cd	Ge	Sn	Ti	Hf	2.673	0.716	Ca	Sr	Ba	Zn	Sn	Zr	Hf	Hf	3.143	1.404	
Mg	Cd	Si	Sn	Al	Ga	Ga	In	1.679	0.604	Ba	Cd	Sn	Zr	Al	Sc	Sc	Y	2.284	1.146	Sr	Ba	Sn	Zr	Al	Sc	Y	Y	2.673	0.743	Be	Be	Sr	Zn	Si	Ti	Zr	Hf	3.143	1.296	
Ba	Cd	Ge	Hf	Al	Al	Ga	In	1.679	0.603	Mg	Ba	Ba	Cd	Si	Sn	Zr	Hf	2.284	1.105	Mg	Zn	Sn	Zr	Al	Ga	Ga	Sc	2.673	0.691	Mg	Zn	Ti	Zr	Ga	Ga	In	Y	3.143	1.209	
Ca	Ba	Si	Sn	Al	Al	In	Sc	1.679	0.571	Mg	Cd	Cd	Sn	Zr	Ga	Ga	Sc	Y	2.284	0.949	Be	Mg	Ge	Sn	Al	Sc	Y	Y	2.673	0.445	Be	Be	Ge	Ti	Al	Ga	In	Y	3.144	0.984
Mg	Ca	Ge	Ge	Al	Ga	In	Y	1.679	0.562	Be	Ca	Ge	Ti	Ga	In	In	Sc	2.284	1.115	Zn	Cd	Si	Zr	Al	Ga	Ga	Y	2.673	0.644	Mg	Ca	Ba	Ba	Zn	Ge	Zr	Hf	3.144	1.121	
Sr	Zn	Ge	Ti	Ga	In	In	Y	1.679	0.558	Zn	Cd	Ge	Sn	Al	Sc	Sc	Y	2.284	1.084	Ca	Ba	Ti	Hf	In	Ga	Sc	Y	2.673	0.591	Be	Zn	Ge	Ti	Al	In	Sc	Sc	3.144	1.030	
Ca	Cd	Sn	Ga	In	In	Sc	Sc	1.680	0.769	Ba	Zn	Zr	Hf	Ga	In	In	Sc	2.284	1.002	Ca	Zn	Zr	Zr	Ga	In	Sc	Y	2.673	0.415	Be	Mg	Ca	Cd	Ge	Ge	Zr	Hf	3.144	1.076	
Ba	Zn	Cd	Cd	Si	Ge	Sn	Hf	1.680	0.762	Ca	Zn	Zn	Ti	Al	Al	Ga	Y	2.284	1.188	Sr	Ba	Zr	Zr	In	Sc	Sc	Y	2.673	0.699	Ca	Sr	Si	Ti	Ga	Sc	Y	Y	3.144	1.181	
Sr	Cd	Ge	Sn	In	Sc	Sc	Y	1.680	0.750	Mg	Ca	Zn	Cd	Ge	Sn	Sn	Hf	2.284	1.160	Be	Ba	Si	Zr	In	Sc	Sc	Y	2.673	0.643	Mg	Mg	Sr	Cd	Si	Ge	Ti	Zr	3.144	1.088	
Mg	Sr	Ge	Hf	Ga	Ga	In	Y	1.680	0.774	Be	Cd	Sn	Zr	Al	Al	Ga	In	2.284	1.065	Be	Mg	Ge	Hf	Al	Ga	Y	Y	2.673	0.555	Be	Zn	Si	Zr	Ga	In	Sc	Sc	3.144	1.045	
Ba	Ba	Ge	Hf	Al	In	In	Y	1.680	0.787	Mg	Cd	Cd	Zn	Zr	Al	In	Sc	2.284	1.235	Ca	Sr	Ba	Cd	Si	Ge	Ti	Ti	2.673	0.723	Be	Mg	Zn	Cd	Sn	Zr	Zr	Hf	3.145	1.279	
Ba	Cd	Si	Ti	Ga	In	In	Y	1.680	0.778	Mg	Cd	Sn	Hf	Ga	In	In	Sc	2.285	1.081	Mg	Sr	Ba	Cd	Ge	Zr	Hf	Hf	2.674	0.541	Be	Cd	Ti	Hf	Al	Al	Ga	Y	3.145	1.119	
Ca	Sr	Sn	Zr	Ga	Ga	In	Y	1.680	0.757	Be	Mg	Ge	Sn	In	Sc	Y	Y	2.285	1.131	Mg	Zn	Ge	Hf	Al	Al	In	Sc	2.674	0.537	Mg	Sr	Ba	Zn	Sn	Ti	Zr	Zr	3.145	1.150	
Ca	Zn	Sn	Hf	Al	In	In	Sc	1.681	0.764	Sr	Cd	Sn	Hf	Al	Sc	Sc	Y	2.285	1.324	Ca	Sr	Ba	Cd	Ge	Ti	Zr	Zr	2.674	0.797	Mg	Zn	Zr	Hf	Al	Al	Ga	In	3.145	1.356	
Be	Sr	Sn	Zr	Ga	In	Y	Y	1.681	0.841	Ca	Sr	Sn	Ti	Al	Ga	Sc	Sc	2.285	1.155	Ca	Sr	Hf	Hf	Al	Al	Ga	Sc	Y	2.674	0.592	Be	Sr	Zn	Cd	Si	Zr	Zr	Hf	3.145	1.175
Ba	Ba	Sn	Zr	Al	Ga	In	Sc	1.682	1.173	Ca	Cd	Zr	Hf	Al	In	In	Y	2.285	1.069	Ca	Sr	Zr	Hf	Al	Ga	Y	Y	2.674	0.389	Be	Mg	Ti	Hf	Ga	Ga	In	Y	3.145	0.905	
Cd	Cd	Si	Sn	Al	In	Sc	Y	1.683	1.135	Ca	Sr	Si	Zr	Al	Ga	Ga	Y	2.285	1.121	Be	Cd	Sn	Hf	Al	Al	Ga	Sc	2.674	0.495	Mg	Ca	Si	Zr	Ga	Sc	Sc	Y	3.145	0.897	
Be	Cd	Si	Sn	Al	In	In	Y	1.683	1.127	Zn	Cd	Sn	Hf	Al	Ga	Sc	Sc	2.286	1.004	Mg	Ba	Ti	Zr	Al	Al	Ga	Y	Y	2.674	0.438	Be	Ca	Si	Hf	Al	Al	Ga	Sc	3.146	0.957
Cd	Cd	Si	Ge	Al	Ga	In	Y	1.684	1.173	Be	Mg	Si	Ge	Ga	In	In	Y	2.286	1.083	Ca	Sr	Ba	Cd	Si	Ti	Zr	Zr	2.674	0.529	Be	Zn	Ge	Zr	Ga	Sc	Sc	Y	3.146	1.140	
Ca	Ba	Ge	Zr	Ga	In	In	Y	1.684	1.158	Sr	Zn	Sn	Zr	Ga	Sc	Y	Y	2.286	1.240	Mg	Ca	Sn	Hf	Al	Al	Sc	Y	2.674	0.671	Be	Cd	Si	Hf	Ga	Sc	Sc	Y	3.146	1.357	
Mg	Ba	Sn	Hf	Al	Ga	Ga	In	1.684	1.030	Ba	Cd	Hf	Hf	Al	In	Sc	Y	2.286	1.099	Ba	Zn	Ti	Zr	Al	Al	Sc	Y	2.674	0.525	Ca	Ba	Si	Zr	Al	Sc	Y	Y	3.146	1.271	
Ba	Zn	Ge	Zr	Al	Ga	Ga	In	1.684	1.236	Be	Sr	Si	Hf	Ga	Ga	In	Y	2.286	1.145	Zn	Zn	Si	Ti	Al	Ga	In	Y	2.674	0.515	Mg	Ca	Ca	Zn	Si	Sn	Zr	Hf	3.146	1.236	
Be	Ca	Si	Sn	Al	In	In	Sc	1.684	1.223	Ca	Cd	Sn	Ti	Al	Al	Ga	Sc	2.286	1.327	Be	Ca	Zr	Zr	Ga	In	Sc	Y	2.674	0.742	Be	Ca	Ba	Zn	Si	Zr	Zr	Hf	3.146	1.424	
Ca	Cd	Ge	Sn	Al																																				

Mg	Ca	Ge	Ge	Ga	In	Sc	Y	1.705	0.466	Cd	Cd	Zr	Hf	Al	Ga	In	Y	2.296	0.951	Zn	Cd	Ge	Ge	Al	In	Sc	Y	Y	2.684	0.645	Be	Mg	Sn	Hf	Al	Al	Ga	Sc	3.164	0.735	
Mg	Zn	Sn	Sn	Al	In	In	Sc	1.705	0.630	Ca	Ba	Ge	Zr	Al	Ga	Y	Y	2.296	1.025	Mg	Sr	Zr	Hf	Al	Al	In	Y	Y	2.684	0.790	Be	Cd	Si	Ti	Al	Ga	Ga	Y	3.164	0.752	
Ca	Cd	Ge	Zr	Ga	Ga	Sc	Y	1.706	0.362	Ca	Sr	Ge	Zr	Zr	Al	In	In	Y	0.950	2.684	Be	Sr	Ba	Zn	Si	Sn	Sn	Zr	Y	2.684	0.774	Be	Sr	Sr	Zn	Si	Ti	Zr	Hf	0.826	0.864
Ba	Cd	Si	Hf	Al	In	In	Sc	1.706	0.440	Mg	Ca	Ge	Ti	Al	In	In	Sc	1.115	2.297	Be	Cd	Ti	Hf	In	Sc	Y	Y	Y	2.684	1.007	Be	Ca	Ba	Zn	Si	Ti	Zr	Zr	3.164	0.803	
Sr	Ba	Ge	Hf	Al	In	In	Sc	1.706	0.619	Be	Cd	Ge	Zr	In	In	Sc	Y	2.297	1.359	Be	Sr	Zn	Cd	Si	Sn	Ti	Ti	Y	2.684	1.270	Be	Ca	Sr	Zn	Si	Si	Sn	Hf	3.165	0.919	
Ca	Ba	Sn	Ti	Ga	Ga	In	Sc	1.707	0.349	Be	Sr	Ba	Cd	Si	Sn	Zr	Zr	2.297	1.213	Be	Sr	Sr	Cd	Ge	Ti	Zr	Hf	Y	2.684	1.126	Mg	Ca	Si	Zr	Al	Al	Sc	Y	3.165	0.859	
Ca	Sr	Sn	Ti	In	In	In	Sc	1.707	0.447	Be	Ba	Si	Hf	Al	Ga	In	In	2.297	1.153	Be	Ca	Sn	Zr	Al	Sc	Sc	Y	Y	2.684	0.936	Be	Mg	Si	Ge	Ga	Sc	Sc	Y	3.165	0.891	
Mg	Sr	Sn	Zr	Ga	In	In	Sc	1.707	0.455	Ba	Zn	Si	Ti	Ga	In	Sc	Sc	2.297	1.439	Mg	Ba	Ge	Zr	Al	Sc	Sc	Y	Y	2.684	1.318	Mg	Zn	Si	Hf	Al	Ga	Ga	Sc	3.165	1.013	
Ca	Cd	Sn	Zr	Ga	Ga	In	Sc	1.707	0.221	Sr	Zn	Si	Hf	Al	In	In	Sc	Sc	2.297	1.274	Mg	Cd	Sn	Hf	Al	Al	Sc	Y	Y	2.684	1.154	Ca	Sr	Ba	Zn	Ge	Zr	Zr	Hf	3.166	0.934
Ba	Cd	Ge	Zr	Ga	Ga	Sc	Y	1.707	0.427	Mg	Ba	Ti	Hf	Ga	In	Y	Y	2.297	1.024	Be	Cd	Ti	Hf	Ga	Sc	Y	Y	Y	2.685	0.730	Be	Sr	Zn	Ge	Ti	Zr	Hf	3.166	0.725		
Sr	Zn	Sn	Hf	Al	Al	Ga	Sc	1.707	0.440	Sr	Cd	Si	Ge	Ga	Sc	Y	Y	2.297	1.100	Sr	Ba	Ti	Zr	In	Sc	Y	Y	Y	2.685	0.870	Be	Ca	Ba	Zn	Si	Ge	Ge	Zr	3.166	0.740	
Sr	Cd	Ge	Ti	Al	Ga	Ga	In	1.707	0.200	Mg	Cd	Ge	Ti	In	In	Sc	Y	2.297	1.045	Be	Ca	Sr	Zn	Si	Si	Ge	Ge	Sn	Y	2.685	0.902	Mg	Ca	Zn	Cd	Si	Ti	Ti	Hf	3.166	0.824
Sr	Ba	Sn	Ti	Al	Ga	Ga	In	1.708	0.573	Be	Zn	Sn	Ti	Ga	In	In	Y	2.298	1.080	Zn	Zn	Ti	Zr	Al	Ga	In	Y	Y	2.685	0.764	Be	Cd	Ti	Zr	Al	Al	Sc	Y	3.166	0.769	
Ba	Zn	Cd	Cd	Si	Ge	Sn	Zr	1.709	0.573	Be	Ba	Si	Hf	Ga	In	In	Sc	2.298	1.173	Be	Ca	Ba	Cd	Sn	Zr	Zr	Hf	Y	2.685	0.918	Mg	Zn	Cd	Cd	Sn	Ti	Zr	Hf	3.167	0.799	
Mg	Ca	Sn	Hf	Ga	In	In	Y	1.709	0.178	Be	Mg	Ge	Sn	Ga	Ga	Sc	Y	2.298	1.319	Be	Ca	Ba	Cd	Ge	Zr	Zr	Hf	Y	2.685	1.142	Be	Zn	Si	Zr	Al	Al	Ga	In	3.167	0.989	
Sr	Cd	Ge	Ti	Ga	In	Y	Y	1.709	0.675	Be	Sr	Ge	Hf	In	In	Sc	Y	2.298	1.268	Mg	Cd	Ge	Hf	In	Sc	Sc	Y	Y	2.685	0.871	Mg	Zn	Si	Hf	Ga	Sc	Sc	Y	3.167	1.560	
Mg	Sr	Sn	Zr	Al	Al	In	In	1.709	0.757	Mg	Cd	Si	Zr	Al	Ga	In	In	2.298	1.253	Mg	Sr	Ba	Cd	Si	Ti	Hf	Hf	Y	2.685	0.906	Be	Cd	Si	Zr	Al	In	In	Sc	3.167	1.460	
Sr	Ba	Sn	Zr	Al	Al	Ga	Y	1.709	0.592	Ca	Cd	Ge	Zr	Al	Ga	Sc	Sc	2.298	1.193	Ca	Ba	Ge	Zr	Al	Sc	Sc	Y	Y	2.685	0.833	Be	Zn	Zn	Cd	Si	Sn	Ti	Zr	3.167	1.356	
Sr	Sr	Ge	Hf	Al	Ga	In	Sc	1.709	0.527	Ca	Sr	Zn	Cd	Si	Ge	Ge	Zr	2.298	1.065	Be	Ca	Ge	Ti	In	Sc	Y	Y	Y	2.686	0.599	Be	Be	Mg	Zn	Ge	Sn	Zr	Hf	3.167	1.138	
Ba	Cd	Ge	Hf	Ga	In	In	Sc	1.709	0.701	Ca	Sr	Ti	Zr	Ga	Ga	In	Y	2.298	1.224	Be	Mg	Ba	Zn	Ge	Sn	Sn	Zr	Y	2.686	0.809	Be	Zn	Ti	Zr	Ga	Ga	Sc	Y	3.167	1.287	
Sr	Zn	Sn	Hf	Al	Al	In	Sc	1.710	0.522	Ba	Cd	Si	Ti	Al	Al	In	Sc	2.298	1.172	Be	Ba	Si	Ti	Al	Al	Ga	Y	Y	2.686	0.733	Be	Ca	Zn	Cd	Si	Ge	Ge	Ti	3.168	1.179	
Mg	Sr	Ge	Sn	Ga	Sc	Sc	Y	1.710	0.498	Mg	Ca	Ge	Hf	Ga	Ga	In	Sc	2.298	1.119	Ca	Sr	Ti	Zr	Ga	Ga	Ga	Sc	Y	2.686	0.562	Be	Zn	Si	Ti	Al	Ga	Ga	In	3.168	1.221	
Sr	Ba	Ge	Hf	In	In	In	Sc	1.710	0.690	Ca	Ba	Si	Zr	Al	Ga	In	In	2.298	1.301	Mg	Ca	Ba	Cd	Si	Sn	Ti	Ti	Y	2.686	0.870	Mg	Cd	Si	Zr	In	In	Sc	Sc	Y	3.168	1.354
Ca	Ca	Si	Sn	Al	In	In	Sc	1.710	0.509	Ca	Sr	Si	Ge	Al	Ga	Y	Y	2.299	1.253	Be	Ca	Ge	Zr	Al	Ga	Sc	Y	Y	2.686	0.791	Be	Ca	Si	Ti	Ga	Sc	Sc	Y	3.168	1.243	
Sr	Sr	Sn	Zr	Ga	Ga	In	Sc	1.711	0.491	Mg	Ca	Sn	Zr	Al	In	In	Sc	2.299	1.171	Mg	Ca	Sr	Cd	Ge	Ge	Sn	Zr	Y	2.687	0.697	Mg	Ca	Zn	Cd	Ti	Ti	Zr	Hf	3.168	1.189	
Ca	Cd	Ge	Ti	Al	In	In	Y	1.711	0.509	Sr	Zn	Si	Zr	Al	Sc	Sc	Y	2.299	1.329	Be	Zn	Si	Ti	Ge	Ga	In	Y	Y	2.687	0.868	Mg	Cd	Ti	Hf	Al	Al	Sc	Y	3.168	1.429	
Sr	Cd	Si	Hf	Al	Ga	In	In	1.711	0.372	Be	Zn	Sn	Hf	Ga	Ga	In	Y	2.299	1.164	Ba	Cd	Si	Zr	Ga	Sc	Sc	Y	Y	2.687	0.674	Ca	Sr	Ba	Zn	Sn	Zr	Zr	Hf	3.169	1.260	
Ba	Cd	Ge	Ti	Al	In	Y	Y	1.712	0.469	Ca	Cd	Si	Ti	Al	Ga	Ga	In	2.299	1.236	Zn	Cd	Sn	Zr	Al	Sc	Sc	Y	Y	2.687	0.672	Be	Mg	Si	Zr	Al	In	In	Sc	3.169	1.285	
Mg	Ba	Ge	Sn	Ga	Sc	Sc	Y	1.712	0.494	Ca	Ba	Sn	Ti	In	Sc	Sc	Y	2.299	1.423	Be	Zn	Sn	Ti	Ga	Ga	In	Sc	Y	2.687	0.949	Be	Sr	Zn	Zn	Si	Ge	Zr	Hf	3.169	1.512	
Ca	Sr	Sn	Ti	Al	In	In	Sc	1.712	0.351	Zn	Cd	Si	Hf	Al	In	In	Sc	2.299	1.243	Mg	Cd	Hf	Hf	Al	Ga	In	Sc	Y	2.687	0.731	Mg	Cd	Ti	Hf	Al	Sc	Y	Y	3.169	1.322	
Mg	Ca	Si	Sn	Al	Ga	Ga	In	1.712	0.611	Ca	Ba	Zn	Cd	Si	Ge	Ti	Ti	2.299	1.120	Mg	Cd	Ti	Hf	Al	In	In	Sc	Y	2.687	0.465	Be	Cd	Si	Zr	Al	Al	Ga	Y	3.169	0.993	
Ca	Cd	Ge	Zr	Ga	Ga	In	Y	1.713	0.612	Zn	Cd	Ge	Zr	Al	Al	Ga	Y	2.299	1.177	Ca	Ca	Sr	Cd	Ge	Sn	Ti	Zr	Y	2.687	0.584	Be	Mg	Zn	Cd	Sn	Ti	Zr	Zr	3.169	0.999	
Ca	Zn	Si	Ge	Al	Ga	In	In	1.713	0.313	Be	Sr	Zn	Cd	Sn	Zr	Zr	Hf	2.299	1.104	Be	Ca	Ti	Ti	Ga	In	Sc	Y	Y	2.687	0.575	Be	Mg	Si	Hf	Ga	Ga	Sc	Y	3.170	1.098	
Ca	Zn	Ge	Zr	Al	In	In	Y	1.713	0.530	Ca	Sr	Si	Ti	Al	In	In	Sc	2.299	1.179	Be	Sr	Cd	Cd	Si	Ge	Zr	Hf	Y	2.687	0.665	Mg	Mg	Ti	Zr	Al	In	Sc	Y	3.171	1.282	
Cd	Cd	Sn	Zr	Al	Ga	Ga	Sc	1.713	0.546	Zn	Cd	Si	Sn	Ga	Sc	Sc	Y	2.299	1.325	Ca	Zn	Ge	Zr	Ga	Sc	Y	Y	2.688	0.811	Be	Mg	Ti	Ti	Ga	In	Sc	Y	3.171	1.505		
Ca	Ba	Sn	Hf	Al	Ga	Ga	Sc	1.714	0.644	Mg	Ca	Ge	Sn	Al	Sc	Y	Y	2.299	1.193	Be	Ba	Zn	Zn	Ge	Sn	Zr	Hf	Y	2.688	0.674	Be	Ca	Si	Hf	Al	Sc	Sc	Y	3.171	1.429	
Ca	Zn	Ge	Sn	Al	In	In	Sc	1.714	0.509	Sr	Cd	Si	Ti	Ga	Ga	Sc	Y	2.299	1.241	Mg	Cd	Zn	Ti	Ti	Al	Ga	Ga	In	Y	2.688	0.643	Mg	Cd	Ti	Zr	In	Sc	Sc	Y	3.171	1.370
Be	Sr	Sn	Hf	Al	In	In	Sc	1.714	0.531	Mg	Ca	Sn	Zr	Al	Al	Ga	In	2.299	1.416	Be	Zn	Si	Zr	Ga	Sc	Sc	Y	Y	2.688	0.888	Be	Mg	Sr	Cd	Si	Ge	Ti	Ti	3.171	1.579	
Be	Zn	Sn	Sn	Ga	In	In	Sc	1.714	0.624	Sr	Ba	Si	Ti	Al	Ga	In	In	2.300	1.265	Zn	Cd	Zr	Hf	Al	Al	In	Sc	Y	2.688	0.731	Be	Mg	Ge	Hf	Ga	Sc	Sc	Y	3.171	1.485	
Be	Sr	Si	Sn	In	In	In	Sc	1.714	0.632	Mg	Ba	Si	Hf	Al	Ga	Ga	In	2.300	1.159	Be	Sr	Ba	Zn	Ge	Sn	Sn	Ti	Y	2.688	0.467	Be	Ca	Zn	Zn	Si	Sn	Ti	Zr	3.171	1.094	
Sr	Ba	Sn	Hf	Ga	Ga	In	Sc	1.715	0.634	Mg	Ca	Si	Ge	Ga	Ga	Sc	Y	2.300	1.218	Be	Be	Sr	Cd	Si	Sn	Zr	Hf	Y	2.688	0.581	Mg	Zn	Ge	Zr	Ga	Sc	Sc	Y	3.172	1.099	
Mg	Sr	Sn	Zr	Al	In	In	Sc	1.715	0.589	Sr	Cd	Sn	Ti	Ga	Sc	Sc	Y	2.300	1.133	Be	Ca	Cd	Cd	Si	Sn	Ti	Hf	Y	2.688	0.595	Mg	Zn	Ti	Hf	Al	Al	In	Sc	3.172	1.273	
Be	Ca	Ge	Sn	Al	Al	Ga	In	1.716	0.514	Zn	Cd	Sn	Ti	Ga	In	Sc	Sc	2.300	1.212	Ca	Zn	Ti	Hf	Ga	Ga	Sc	Y	Y	2.688	0.480	Be	Cd	Ti	Hf	Al	Sc	Sc	Y	3.172	1.168	
Ca	Sr	Sn	Zr	Al	Ga	In	In	1.716	0.510	Sr	Cd	Si	Ge	Al	Al	Sc	Y	2.300	1.287	Mg	Zn	Si	Sn	Ga	Sc	Sc	Y	Y	2.689	0.608	Mg	Ca	Ti	Hf	Al	Ga	Sc	Sc	3.172	1.188	
Sr	Ba	Si	Ge	Ga	Ga	In	Sc	1.717																																	

Ca	Sr	Sn	Ti	Ga	Ga	In	Y	1.735	0.319	Ca	Sr	Ge	Ti	Ga	Ga	Sc	Y	2.312	1.508	Mg	Ca	Zn	Cd	Si	Ge	Zr	Zr	2.699	1.063	Ca	Sr	Sr	Zn	Si	Ti	Zr	Hf	3.189	1.130	
Ba	Zn	Sn	Zr	Al	In	Sc	Sc	1.735	-0.010	Ca	Cd	Si	Zr	Al	Ga	Ga	Y	2.313	1.373	Mg	Sr	Zr	Hf	Ga	Ga	Sc	Y	2.699	0.918	Be	Be	Sn	Ti	Al	Ga	Sc	Y	3.190	1.060	
Mg	Cd	Ge	Sn	Al	Ga	Y	Y	1.735	0.310	Sr	Cd	Si	Ti	In	Sc	Sc	Y	2.313	1.237	Be	Cd	Ge	Zr	Al	Ga	Ga	Y	2.699	0.610	Be	Mg	Sr	Ba	Si	Si	Ge	Sn	3.190	0.770	
Ba	Zn	Sn	Zr	Al	Al	Ga	In	1.735	0.309	Zn	Cd	Zr	Hf	Al	In	In	Y	2.313	1.286	Mg	Sr	Ti	Hf	Al	Ga	Ga	In	2.699	0.723	Be	Mg	Ti	Hf	Ga	In	In	Sc	3.190	0.799	
Mg	Ba	Si	Sn	Al	Al	Ga	Sc	1.736	-0.026	Mg	Cd	Ge	Ti	Al	In	In	Sc	2.313	1.265	Mg	Cd	Ti	Zr	Ga	Ga	In	Y	2.699	0.787	Mg	Cd	Ti	Hf	Al	Ga	Sc	Sc	3.190	0.941	
Mg	Ba	Sn	Zr	Al	Al	Ga	In	1.736	0.509	Zn	Zn	Sn	Ti	Al	Ga	In	Sc	2.314	1.276	Ca	Ba	Zn	Cd	Si	Zr	Hf	Hf	2.699	0.610	Be	Be	Mg	Zn	Si	Sn	Zr	Hf	3.190	0.817	
Ca	Ba	Ge	Ti	Al	In	In	Y	1.737	0.506	Sr	Cd	Sn	Hf	Al	Ga	Sc	Y	2.314	1.342	Be	Cd	Ti	Hf	Ga	Ga	In	In	Sc	2.699	0.737	Ca	Sr	Sr	Zn	Ge	Ti	Zr	Hf	3.191	0.861
Ba	Zn	Sn	Hf	Al	Ga	Sc	Sc	1.738	-0.045	Ba	Zn	Sn	Hf	Al	Ga	Sc	Y	2.314	1.489	Mg	Zn	Ti	Hf	Al	In	In	Y	2.700	0.971	Be	Mg	Ti	Zr	Al	Ga	In	In	3.191	1.100	
Mg	Ba	Ge	Sn	Al	Al	Sc	Y	1.739	0.557	Mg	Sr	Zn	Cd	Ge	Sn	Ti	2.314	1.392	Be	Ca	Cd	Cd	Si	Sn	Ti	Zr	2.700	1.044	Mg	Mg	Ca	Zn	Si	Ge	Sn	Sc	3.192	1.274		
Be	Sr	Sn	Ti	Ga	In	In	Sc	1.739	0.610	Ba	Cd	Si	Ti	Al	In	Sc	Sc	2.314	1.368	Mg	Zn	Sn	Hf	Ga	Sc	Y	Y	2.700	1.072	Mg	Zn	Cd	Cd	Si	Ge	Ti	Hf	3.192	1.189	
Ca	Cd	Si	Sn	Al	Ga	Sc	Sc	1.739	0.379	Zn	Cd	Sn	Hf	Al	Al	Ga	Sc	2.314	1.297	Ca	Sr	Zn	Zn	Si	Ge	Ti	Zr	2.700	1.009	Be	Mg	Sn	Ti	Ga	Sc	Sc	Y	3.193	1.096	
Ca	Ba	Ge	Hf	In	In	Sc	Y	1.739	0.454	Ca	Sr	Sn	Hf	In	Sc	Y	2.314	1.234	Mg	Zn	Sn	Ti	Ga	In	Sc	Sc	2.700	0.900	Be	Ba	Zn	Cd	Si	Si	Ge	Ti	3.194	0.965		
Zn	Cd	Sn	Hf	Al	In	In	Sc	1.740	0.563	Ca	Ba	Ge	Ti	Al	Al	In	Sc	2.314	1.346	Mg	Ca	Si	Hf	Al	Al	In	Y	2.700	1.022	Mg	Mg	Ba	Zn	Ge	Sn	Zr	Hf	3.194	1.079	
Mg	Ca	Si	Ge	Al	In	In	Y	1.740	0.316	Be	Cd	Si	Sn	Al	In	Sc	Sc	2.314	1.283	Be	Mg	Ge	Sn	Al	Ga	Ga	Sc	2.700	0.955	Be	Mg	Ba	Zn	Ge	Zr	Zr	Hf	3.194	0.981	
Ca	Ba	Sn	Ti	Al	Ga	In	In	1.740	0.437	Sr	Ba	Ge	Hf	Al	Al	Sc	Y	2.314	1.289	Mg	Sr	Ti	Zr	Al	Al	In	Y	2.700	0.861	Be	Cd	Si	Ti	In	Sc	Sc	Y	3.194	1.037	
Be	Ba	Si	Sn	Al	Ga	Y	Y	1.740	0.555	Be	Cd	Sn	Ti	Al	Ga	Y	Y	2.315	1.415	Be	Sr	Ba	Zn	Si	Sn	Zr	Zr	2.700	1.079	Be	Sr	Zn	Cd	Si	Si	Ge	Hf	3.195	1.157	
Mg	Ca	Ge	Sn	Al	Al	In	Sc	1.741	0.306	Ba	Ba	Zn	Cd	Si	Ti	Zr	Hf	2.315	1.356	Mg	Ba	Ge	Hf	Al	Al	Sc	Y	2.701	1.008	Be	Ca	Ba	Zn	Si	Ge	Ti	Ti	3.195	1.055	
Ba	Zn	Ge	Zr	Ga	Ga	Sc	Y	1.741	0.366	Ba	Zn	Ge	Zr	In	Sc	Sc	Y	2.315	1.320	Ca	Zn	Ge	Ti	Al	Al	Ga	Sc	2.701	0.972	Be	Zn	Zr	Hf	Al	In	Sc	Sc	3.195	0.991	
Ba	Zn	Ge	Ti	Al	In	Y	Y	1.741	0.368	Mg	Ba	Ge	Hf	In	Sc	Sc	Y	2.315	1.441	Be	Mg	Sn	Zr	In	Sc	Y	Y	2.701	1.065	Be	Mg	Zn	Cd	Ge	Ti	Hf	Hf	3.195	1.184	
Ba	Cd	Si	Zr	Ga	Ga	In	Y	1.742	0.184	Ca	Ba	Si	Hf	Ga	In	Y	Y	2.315	1.283	Mg	Cd	Sn	Ti	Al	Al	Ga	Sc	Sc	2.701	0.903	Be	Mg	Ca	Cd	Sn	Ti	Ti	Hf	3.195	1.046
Mg	Sr	Ge	Zr	Ga	In	In	Y	1.742	0.354	Sr	Sr	Si	Zr	Al	Ga	In	Sc	2.315	1.388	Mg	Sr	Si	Ti	Ga	Ga	Sc	Y	2.701	0.944	Be	Ca	Ca	Zn	Si	Ge	Sn	Hf	3.196	1.075	
Ba	Cd	Si	Ge	Al	Ga	Ga	Sc	1.742	0.358	Ca	Ba	Ge	Ti	Al	In	Sc	Sc	2.315	1.527	Be	Ba	Ti	Hf	Al	Al	Ga	Y	2.701	1.141	Mg	Ba	Zn	Cd	Ti	Zr	Hf	Hf	3.198	1.278	
Be	Ba	Si	Sn	Ga	Sc	Sc	Y	1.742	0.168	Be	Ba	Ti	Hf	Ga	In	In	Sc	2.315	1.354	Ca	Sr	Ti	Zr	Al	In	Sc	Sc	2.701	0.955	Be	Zn	Si	Hf	In	Sc	Sc	Y	3.196	1.117	
Sr	Zn	Sn	Ti	Al	Ga	Ga	Y	1.742	0.552	Zn	Cd	Sn	Hf	Al	Al	Sc	Y	2.316	1.232	Mg	Ca	Ba	Cd	Si	Si	Sn	Hf	2.701	0.734	Be	Mg	Si	Ge	Al	Ga	Ga	In	3.197	0.785	
Ba	Cd	Sn	Zr	Al	Al	Ga	Sc	1.743	0.551	Mg	Sr	Cd	Cd	Si	Ge	Sn	Hf	2.316	1.277	Mg	Mg	Ge	Ti	Al	Ga	In	Y	2.701	0.846	Mg	Sr	Ba	Zn	Si	Ge	Ge	Zr	3.197	0.806	
Sr	Cd	Sn	Zr	Al	Al	Ga	Sc	1.743	0.148	Mg	Cd	Sn	Zr	Al	Al	In	Sc	2.316	1.253	Ca	Sr	Ba	Zn	Si	Ge	Ge	Sn	2.702	0.878	Mg	Cd	Zr	Hf	Al	Ga	Ga	Sc	3.197	0.942	
Ca	Cd	Ge	Hf	Ga	In	Y	Y	1.743	0.368	Mg	Zn	Sn	Zr	Al	Al	In	Y	2.316	1.317	Mg	Sr	Ba	Cd	Ge	Ge	Ti	Zr	2.702	0.898	Mg	Mg	Si	Ti	Al	In	Sc	Y	3.198	1.002	
Ca	Zn	Si	Ge	Ga	In	Y	Y	1.743	0.364	Be	Ca	Si	Hf	Ga	In	In	Y	2.316	1.425	Ca	Sr	Ba	Cd	Sn	Zr	Zr	Hf	2.702	0.969	Be	Mg	Ba	Zn	Sn	Zr	Zr	Hf	3.198	1.181	
Mg	Ba	Sn	Hf	Al	In	Y	Y	1.744	0.506	Zn	Cd	Si	Ge	Al	Al	In	Sc	2.316	1.312	Be	Ca	Sn	Ti	Al	Al	Ga	Sc	2.702	0.856	Mg	Zn	Sr	Zn	Sn	Ti	Hf	Y	3.198	1.125	
Ca	Zn	Ge	Ge	Al	Ga	In	Sc	1.744	0.357	Ba	Ba	Ti	Hf	Ga	In	Sc	Y	2.316	1.381	Mg	Ca	Ba	Cd	Ge	Ge	Zr	Hf	2.702	0.874	Mg	Zn	Zr	Hf	Al	Sc	Y	Y	3.198	1.078	
Sr	Cd	Ge	Hf	Al	Ga	In	Sc	1.745	0.354	Ca	Zn	Si	Ti	In	In	Sc	Sc	2.316	1.508	Mg	Sr	Ti	Zr	Al	Al	Ga	Y	2.702	1.040	Be	Ca	Zn	Cd	Si	Zr	Hf	Hf	3.198	1.265	
Ca	Cd	Si	Ge	Ga	Ga	In	Sc	1.745	0.491	Cd	Cd	Ti	Zr	Al	Ga	In	Y	2.316	1.376	Ca	Sr	Ti	Zr	Al	Ga	Ga	Sc	2.702	0.907	Mg	Mg	Zn	Cd	Si	Ti	Zr	Hf	3.199	1.190	
Sr	Zn	Ge	Ti	Ga	In	In	Sc	1.745	0.540	Mg	Zn	Si	Ge	Al	In	In	Sc	2.317	1.259	Be	Cd	Zr	Hf	Ga	In	Ga	Sc	2.702	0.693	Mg	Ca	Ge	Ti	Al	Sc	Y	Y	3.199	0.804	
Ba	Ba	Si	Sn	Al	Ga	Sc	Y	1.745	0.537	Ba	Zn	Ti	Zr	Al	Al	In	Y	2.317	1.306	Sr	Ba	Zr	Hf	Ga	Sc	Sc	Y	2.702	0.799	Be	Mg	Si	Sn	Al	Al	Ga	Sc	3.199	0.823	
Ba	Cd	Ge	Zr	Al	Al	Ga	In	1.745	0.487	Ca	Zn	Si	Sn	Al	Al	Sc	Y	2.317	1.281	Be	Sr	Ti	Zr	Al	Al	Ga	In	2.702	0.845	Be	Mg	Mg	Cd	Si	Ge	Sn	Ti	3.200	1.020	
Be	Sr	Ba	Cd	Si	Ge	Sn	Sn	1.745	0.335	Zn	Ge	Ge	Hf	Al	Ga	In	Sc	2.318	1.298	Be	Zn	Si	Sn	Al	Sc	Y	Y	2.702	0.685	Mg	Sr	Ba	Zn	Si	Zr	Zr	Hf	3.200	0.849	
Sr	Zn	Ge	Ti	Ga	In	In	Y	1.745	0.328	Be	Sr	Ti	Zr	Ga	In	In	Y	2.318	1.362	Be	Ba	Ti	Hf	Al	Al	Sc	Y	Y	2.702	0.804	Be	Mg	Ca	Cd	Ti	Zr	Zr	Hf	3.200	0.884
Ba	Zn	Ge	Sn	Ga	Sc	Y	Y	1.745	0.171	Zn	Zn	Ge	Hf	Ga	In	In	Sc	Y	2.318	1.502	Be	Cd	Si	Sn	Al	Sc	Sc	Y	2.703	1.006	Be	Mg	Ti	Zr	Ga	Ga	In	Y	3.200	1.183
Sr	Zn	Ge	Sn	Al	Al	Sc	Y	1.746	0.713	Ca	Sr	Si	Ti	Ga	Ga	In	Y	2.318	1.215	Be	Ba	Zr	Hf	Al	Al	Sc	Sc	Y	2.703	1.047	Be	Mg	Ca	Cd	Ti	Ti	Zr	Hf	3.200	1.232
Zn	Cd	Ge	Ge	Al	Ga	In	Sc	1.747	0.652	Ca	Sr	Ge	Hf	Al	Ga	Sc	Sc	2.318	1.164	Mg	Ca	Sn	Ti	Al	Al	Sc	Y	2.703	1.075	Be	Mg	Mg	Cd	Si	Sn	Ti	Zr	3.201	1.161	
Mg	Sr	Si	Ge	Ga	In	Y	Y	1.747	0.566	Be	Ba	Cd	Cd	Si	Sn	Zr	Hf	2.318	1.126	Be	Mg	Sr	Cd	Sn	Sn	Zr	Hf	2.703	1.015	Be	Zn	Ge	Hf	Al	Al	Sc	Y	3.201	1.091	
Be	Sr	Si	Sn	Al	Ga	Ga	Sc	1.747	0.706	Zn	Cd	Si	Hf	Al	In	Y	Y	2.318	1.022	Be	Mg	Zn	Cd	Ge	Sn	Sn	Ti	2.703	0.921	Ca	Sr	Si	Ti	Al	Sc	Sc	Y	3.201	1.013	
Sr	Zn	Si	Sn	Al	Al	In	Sc	1.747	0.781	Mg	Ba	Cd	Cd	Si	Sn	Ti	Zr	2.318	1.123	Be	Be	Mg	Cd	Si	Ge	Sn	Hf	2.704	1.033	Be	Zn	Ge	Hf	Al	Al	Ga	Sc	3.201	1.102	
Ca	Zn	Ge	Hf	Ga	Ga	In	Y	1.747	0.686	Zn	Cd	Ge	Hf	Ga	Ga	Sc	Y	2.318	1.097	Ca	Sr	Zr	Zr	Al	Ga	In	Sc	2.704	0.969	Be	Be	Sr	Zn	Si	Ge	Zr	Hf	3.202	1.026	
Sr	Zn	Sn	Ti	Al	Ga	Ga	In	1.747	0.523	Ca	Sr	Zr	Hf	In	In	Sc	Y	2.318	1.076	Ca	Zn	Sn	Zr	Al	Al	Sc	Sc	Y	2.704	0.884	Be	Mg	Ba	Zn	Si	Zr	Zr	Hf	3.202	1.071
Ca	Sr																																							

Sr	Cd	Ge	Zr	Al	Ga	Y	Y	1.765	-0.032	Sr	Zn	Ti	Hf	Al	Ga	Y	Y	2.329	1.284	Mg	Ca	Ge	Zr	Al	Al	Ga	Sc	2.713	0.775	Be	Be	Ge	Ti	Al	In	Sc	Y	3.219	0.905	
Mg	Cd	Si	Sn	Ga	Al	In	Sc	1.765	0.554	Mg	Ba	Zr	Hf	Al	In	In	Y	2.329	0.985	Sr	Zn	Ti	Hf	In	Sc	Y	Y	2.713	0.880	Ca	Cd	Ti	Zr	Al	Sc	Sc	Y	3.220	1.021	
Mg	Ba	Sn	Hf	Al	Al	In	Y	1.765	0.640	Ca	Ba	Cd	Ge	Zr	Al	Al	Ga	Sc	2.329	0.796	Be	Sr	Hf	Hf	Al	Ga	Sc	Y	2.713	0.847	Be	Ca	Sn	Cd	Si	Si	Zr	Hf	3.220	0.921
Be	Ba	Ge	Hf	Ga	In	Y	Y	1.765	0.421	Mg	Ba	Ge	Si	Al	In	Sc	Sc	2.329	0.652	Mg	Ca	Si	Hf	Ga	In	Al	Ga	Sc	2.713	0.848	Be	Zn	Zr	Hf	Al	Sc	Sc	Y	3.220	0.897
Be	Sr	Sn	Zr	Al	In	In	Sc	1.766	0.455	Ba	Ba	Si	Ti	Ga	In	Sc	Y	2.329	0.319	Be	Zn	Ge	Sn	Al	Al	Ga	Sc	2.713	0.756	Mg	Zn	Ti	Ti	Al	Ga	In	Sc	3.220	0.812	
Sr	Zn	Si	Ti	Al	Ga	Y	Y	1.766	0.608	Mg	Zn	Sn	Ti	Ga	In	In	Sc	2.329	0.442	Mg	Ba	Cd	Cd	Ge	Ti	Zr	Hf	2.714	0.782	Be	Sr	Zn	Cd	Si	Ti	Ti	Zr	3.220	0.857	
Sr	Cd	Si	Ge	Al	Al	In	Y	1.766	0.373	Mg	Sr	Ti	Zr	Ga	In	In	Y	2.329	0.310	Be	Cd	Hf	Hf	Al	Ga	In	Y	2.714	0.786	Be	Mg	Ca	Cd	Ge	Ti	Ti	Hf	3.220	0.833	
Ba	Ba	Ge	Zr	Al	Ga	In	Y	1.766	0.439	Be	Mg	Ba	Cd	Ge	Sn	Sn	Zr	2.329	0.545	Mg	Cd	Si	Hf	Al	Al	Ga	In	2.714	0.724	Be	Zn	Sn	Ti	Al	Sc	Sc	Y	3.220	0.868	
Sr	Ba	Ge	Zr	Al	In	In	Sc	1.767	0.602	Mg	Zn	Ge	Zr	Ga	Ga	In	Y	2.329	0.472	Mg	Ca	Ge	Zr	In	Sc	Y	Y	2.714	0.773	Ca	Ca	Sr	Zn	Si	Al	Ge	Ti	Zr	3.221	0.900
Sr	Ba	Cd	Cd	Ge	Sn	Zr	Hf	1.767	0.365	Be	Cd	Sn	Hf	In	Sc	Y	Y	2.330	0.347	Be	Cd	Ti	Hf	Ga	Ga	In	Y	2.714	0.778	Be	Mg	Sr	Ba	Ge	Sn	Hf	3.221	0.874		
Be	Ba	Sn	Hf	Ga	In	In	Sc	1.767	0.316	Mg	Sr	Si	Zr	Al	Ga	In	In	2.330	0.428	Sr	Zn	Si	Zr	In	Sc	Sc	Y	2.714	0.843	Ca	Ca	Ba	Zn	Si	Ti	Zr	Hf	3.221	0.839	
Ba	Cd	Si	Zr	Ga	In	In	Sc	1.767	0.329	Be	Ba	Ba	Cd	Si	Sn	Hf	2.330	0.710	Be	Sr	Zr	Hf	Ga	Ga	In	Sc	2.714	0.900	Mg	Zn	Ge	Ti	Al	Al	Sc	Y	3.221	0.979		
Sr	Ba	Zn	Cd	Si	Sn	Sn	Hf	1.767	0.208	Be	Cd	Si	Ti	Al	Al	Ga	Y	2.330	0.480	Be	Cd	Ge	Zr	In	Al	Ga	Sc	2.714	0.798	Ca	Sr	Ba	Zn	Si	Si	Ti	Zr	3.221	0.913	
Ca	Ba	Sn	Ti	Al	Ga	Ga	In	1.767	0.306	Be	Mg	Ge	Sn	Al	Al	In	Y	2.330	0.669	Be	Ca	Ti	Hf	Ga	In	In	Sc	2.714	0.821	Be	Mg	Cd	Cd	Si	Ge	Ti	Hf	3.222	0.907	
Ba	Cd	Si	Hf	Ga	In	Y	Y	1.767	0.322	Be	Ca	Ge	Ti	Al	Ga	In	In	2.330	0.754	Mg	Ba	Ti	Zr	Al	Al	Ga	Y	2.715	0.909	Be	Sr	Ba	Zn	Ti	Zr	Zr	Hf	3.223	1.037	
Ca	Sr	Ge	Hf	In	In	Sc	Y	1.767	0.194	Be	Cd	Sn	Hf	Al	Al	In	Sc	2.330	0.514	Mg	Mg	Ca	Ti	Hf	In	In	Sc	Y	2.715	0.787	Mg	Mg	Ca	Zn	Si	Ge	Sn	Zr	3.223	0.950
Ca	Ba	Sn	Hf	Ga	In	Y	Y	1.767	0.483	Mg	Sr	Cd	Cd	Si	Ge	Sn	Zr	2.330	0.440	Be	Ba	Ti	Zr	Al	Ti	Ga	Sc	Y	2.715	0.789	Be	Ca	Sr	Zn	Si	Si	Sn	Ti	3.223	0.783
Ca	Cd	Sn	Zr	Al	Ga	Y	Y	1.767	0.482	Mg	Sr	Zr	Zr	Ga	In	Sc	Y	2.330	0.296	Mg	Ca	Ge	Hf	Al	Al	Sc	Y	2.715	0.830	Be	Mg	Ge	Hf	Al	Ga	Sc	Sc	3.223	0.783	
Mg	Ba	Ge	Hf	Ga	In	In	Sc	1.768	0.162	Ba	Cd	Ti	Ti	Al	In	Sc	Y	2.330	0.259	Mg	Ca	Ba	Cd	Si	Si	Sn	Zr	2.715	0.746	Be	Ba	Ba	Zn	Zn	Si	Ge	Ti	Hf	3.223	0.831
Be	Sr	Ge	Zr	Ga	In	In	Y	1.768	0.301	Ba	Cd	Zr	Zr	Al	Ga	In	Sc	2.330	0.562	Mg	Sr	Ge	Hf	Al	Al	Sc	Y	2.715	0.784	Be	Mg	Si	Hf	Ga	Ga	In	Sc	3.223	0.807	
Sr	Ba	Zn	Cd	Sn	Sn	Zr	Hf	1.768	0.306	Sr	Sr	Ti	Hf	Al	Ga	In	Y	2.331	0.839	Zn	Cd	Si	Zr	Ga	Ga	Sc	Y	2.715	0.817	Be	Ca	Zn	Cd	Si	Zr	Zr	Hf	3.223	0.932	
Ca	Zn	Sn	Al	Ga	Y	Y	Y	1.768	0.495	Mg	Ca	Cd	Cd	Ge	Sn	Zr	Hf	2.331	0.725	Mg	Sr	Ti	Hf	In	In	Sc	Sc	Y	2.715	0.692	Be	Ca	Ti	Zr	Al	Ga	Ga	Sc	3.223	0.874
Be	Cd	Sn	Hf	Al	Ga	In	In	1.768	0.292	Ca	Sr	Zr	Hf	Al	In	In	Y	2.331	0.787	Sr	Ba	Ba	Zn	Ge	Sn	Zr	Hf	2.715	0.767	Be	Mg	Si	Hf	Ga	In	Sc	Sc	3.224	0.868	
Sr	Cd	Si	Ti	Ga	In	In	Y	1.769	0.298	Mg	Ca	Sr	Ti	Ti	Ga	Ga	Sc	Y	2.331	0.875	Zn	Cd	Ti	Ti	Ti	Ga	In	Sc	2.715	0.823	Be	Zn	Ti	Hf	Ga	Sc	Sc	Y	3.224	0.982
Sr	Zn	Sn	Ti	Al	Al	In	Y	1.769	0.483	Mg	Cd	Si	Sn	Ga	Ga	Sc	Y	Y	2.331	0.744	Mg	Sr	Ba	Cd	Si	Zr	Hf	Hf	2.716	0.679	Zn	Cd	Si	Ti	Al	Sc	Y	Y	3.224	0.905
Mg	Sr	Si	Ge	Ga	Ga	In	Sc	1.769	0.455	Ca	Ba	Si	Si	Al	Ga	In	Sc	2.331	0.581	Ca	Ba	Si	Zr	In	In	Sc	Sc	Y	2.716	0.765	Be	Ca	Sr	Zn	Sn	Ti	Zr	Zr	3.224	0.759
Mg	Sr	Sn	Ti	Al	Ga	Ga	In	Y	0.453	Mg	Sr	Ge	Ti	Al	Al	Ga	In	2.331	0.446	Ba	Zn	Zr	Hf	Ga	Ga	Sc	Y	2.716	0.800	Mg	Sr	Sr	Zn	Sn	Ti	Zr	Hf	3.224	0.757	
Be	Cd	Si	Sn	Ga	Ga	In	Y	1.769	0.469	Zn	Cd	Ge	Ti	Al	Al	In	Y	2.331	0.492	Be	Cd	Zr	Hf	Hf	Ga	Ga	In	Y	2.716	0.652	Be	Mg	Sr	Zn	Si	Si	Sn	Ti	3.225	0.785
Ba	Ba	Si	Hf	Al	Ga	In	In	1.769	0.254	Sr	Ba	Cd	Zn	Si	Ge	Zr	Hf	2.332	0.646	Ba	Cd	Si	Hf	Al	Al	Sc	Y	2.716	0.719	Be	Mg	Sr	Ba	Ge	Sn	Sr	Zr	3.225	0.767	
Mg	Sr	Sn	Hf	Al	Ga	Ga	Y	1.770	0.247	Be	Cd	Zn	Zr	Ga	Ga	In	Y	2.332	0.531	Sr	Ba	Zr	Hf	Al	Al	Ga	Sc	Y	2.716	0.766	Be	Mg	Sn	Ti	Al	Al	Sc	Y	3.225	0.778
Ca	Sr	Ge	Ti	Al	In	In	Y	1.770	0.111	Mg	Ba	Ge	Hf	Al	Ga	Sc	Sc	2.332	0.755	Sr	Cd	Ti	Zr	Al	Al	Sc	Y	2.716	0.787	Mg	Ca	Sr	Zn	Ge	Sn	Ti	Ti	3.225	0.912	
Ca	Sr	Sn	Ti	Al	Ga	In	In	1.770	0.665	Be	Sr	Ge	Ti	Al	Al	Ga	In	2.332	1.155	Be	Mg	Sr	Cd	Si	Sn	Hf	Hf	2.717	1.064	Mg	Ba	Ba	Zn	Ge	Ti	Zr	Hf	3.226	1.035	
Mg	Zn	Ge	Sn	Ga	Ga	In	Sc	1.771	0.641	Sr	Ba	Zn	Cd	Ge	Ti	Hf	2.332	0.969	Mg	Ba	Ba	Zn	Ge	Sn	Zr	Hf	2.717	1.106	Mg	Cd	Si	Hf	Al	Sc	Sc	Y	3.226	0.923		
Ba	Cd	Ge	Zr	Al	Al	In	Y	1.771	0.523	Ca	Cd	Si	Zr	Al	Al	In	Y	2.332	0.563	Mg	Sr	Ti	Zr	Ga	Ga	In	Sc	2.717	1.022	Be	Sr	Ca	Ba	Zn	Si	Ge	Ge	Ti	3.226	0.914
Sr	Ba	Si	Ge	Al	Ga	Ga	Sc	1.771	0.510	Ca	Ba	Zn	Cd	Si	Si	Zr	Hf	2.332	0.850	Ba	Zn	Ti	Zr	Al	Al	Ga	Sc	2.717	0.528	Be	Sr	Zn	Cd	Si	Si	Ti	Hf	3.226	0.815	
Mg	Ba	Sn	Ti	Al	Ga	Ga	In	1.771	0.619	Ca	Sr	Ba	Cd	Sn	Sr	Zr	Hf	2.332	0.644	Be	Zn	Ge	Ge	Al	Ga	Sc	Y	2.717	0.907	Be	Sr	Zn	Cd	Ti	Ti	Zr	Hf	3.227	0.852	
Sr	Ba	Ge	Zr	In	In	Sc	Y	1.772	0.488	Sr	Ba	Si	Zr	Al	Al	Ga	Y	2.332	0.539	Sr	Ba	Zr	Hf	Al	Al	Sc	Y	2.717	0.822	Mg	Cd	Ti	Hf	Ga	Ga	Sc	Y	3.227	0.845	
Sr	Cd	Sn	Ti	Al	Ga	Ga	Sc	1.772	0.355	Mg	Mg	Si	Sn	Al	In	Sc	Y	2.333	0.782	Be	Cd	Si	Zr	Al	Al	Ga	Y	2.717	0.431	Be	Mg	Zr	Hf	Al	Al	In	Y	3.227	0.857	
Be	Ba	Ge	Ti	In	In	Sc	Y	1.772	0.555	Be	Zn	Sn	Zr	Zr	Al	Ga	Y	2.333	0.672	Mg	Zn	Sn	Ti	Al	Al	In	Sc	2.718	0.925	Mg	Zn	Ge	Hf	Al	Sc	Sc	Y	3.227	0.869	
Be	Ba	Si	Ge	Ga	In	Sc	Sc	1.772	0.423	Sr	Sr	Ba	Cd	Ge	Sn	Zr	Hf	2.333	0.573	Ca	Zn	Ge	Hf	Ga	Sc	Sc	Y	2.718	0.839	Mg	Mg	Sr	Zn	Si	Ge	Sn	Ti	3.228	0.862	
Sr	Ba	Sn	Zr	Ga	Ga	In	Sc	1.773	0.331	Be	Ba	Zr	Hf	Al	In	In	Y	2.333	0.660	Ca	Cd	Ge	Zr	Ga	Sc	Sc	Y	2.718	0.661	Ca	Cd	Si	Ti	Al	Sc	Sc	Y	3.228	0.846	
Sr	Cd	Si	Zr	Al	Ga	In	In	1.773	0.544	Be	Ba	Zr	Hf	In	Sc	Y	Y	2.333	0.899	Mg	Zn	Ti	Hf	Al	In	Y	Y	2.718	0.987	Ca	Ca	Ba	Zn	Sn	Ti	Zr	Hf	3.228	0.987	
Mg	Ca	Si	Sn	Al	Ga	Ga	Y	1.773	0.413	Be	Sr	Si	Zr	Al	In	In	Sc	2.333	0.706	Be	Ca	Ba	Zn	Si	Sn	Sn	Hf	2.718	0.757	Mg	Cd	Ti	Zr	Zr	Al	Sc	Y	Y	3.229	0.937
Sr	Sr	Ge	Zr	Al	Ga	In	Y	1.773	0.751	Ca	Cd	Ti	Zr	Ga	In	Y	Y	2.333	0.896	Mg	Ca	Si	Zr	Al	Ga	Ga	Sc	Y	2.718	0.576	Be	Mg	Ge	Ti	Al	Ga	Ga	In	3.229	0.899
Mg	Sr	Sn	Ti	Al	In	In	Sc	1.773	0.847	Be	Cd	Ge	Hf	Al	Ga	Y	Y	2.333	0.941	Mg	Ca	Zr	Zr	Ga	In	Ga	Sc	Y	2.718	1.024	Ca	Zn	Zr	Hf	Al	Sc	Sc	Y		

Sr	Zn	Ge	Zr	Al	Ga	Y	Y	1.791	0.515	Zn	Cd	Si	Ge	In	Sc	Y	Y	2.343	0.860	Mg	Ba	Si	Zr	In	Sc	Y	Y	2.727	0.611	Be	Mg	Ca	Zn	Ge	Sn	Zr	Zr	3.249	0.588	
Ca	Zn	Ge	Hf	Ga	In	Al	Y	1.791	0.703	Be	Mg	Si	Ge	Ga	In	Y	Y	2.343	0.572	Ca	Ba	Si	Zr	Al	Ga	Sc	Sc	2.727	0.827	Mg	Sr	Zn	Zn	Sn	Ti	Zr	Hf	3.249	0.608	
Ba	Zn	Ge	Hf	Al	In	Y	Sc	1.791	0.474	Ca	Cd	Zr	Hf	Ga	In	Y	Y	2.343	0.560	Mg	Ca	Ti	Ti	Ga	In	Sc	Y	2.727	0.796	Be	Mg	Zr	Hf	Ga	Sc	Y	Y	3.249	0.517	
Zn	Cd	Sn	Hf	Al	Ga	Ga	In	1.792	0.392	Sr	Cd	Ti	Zr	Al	Ga	Y	Y	2.344	0.659	Mg	Ca	Ti	Hf	Al	Ga	In	In	2.727	0.745	Be	Mg	Ca	Zn	Si	Sn	Zr	Zr	3.250	0.545	
Be	Ba	Sn	Hf	Al	Al	In	Y	1.792	0.413	Be	Ba	Zr	Hf	Al	Ga	In	In	2.344	0.700	Mg	Sr	Ti	Zr	Ga	Ga	Sc	Y	2.727	0.832	Mg	Ca	Si	Hf	Al	Sc	Zr	Y	3.250	0.795	
Zn	Cd	Ge	Hf	Ga	In	In	Y	1.792	0.304	Mg	Cd	Si	Ge	Ga	In	Sc	Sc	2.344	0.644	Zn	Cd	Si	Ge	Al	Sc	Y	Y	2.728	0.682	Be	Zn	Si	Zr	Al	In	Sc	Sc	3.251	0.620	
Sr	Ba	Ge	Ge	Al	Ga	Sc	Y	1.792	0.379	Ca	Cd	Ge	Ti	Al	Al	Ga	Y	2.344	0.917	Be	Ca	Sr	Cd	Si	Ge	Hf	Hf	2.728	0.723	Be	Mg	Zr	Zr	Al	Ga	In	Y	3.251	0.682	
Ca	Ba	Sn	Zr	Al	Al	Ga	Y	1.793	0.405	Zn	Zn	Sn	Zr	Al	Ga	Sc	Y	2.344	0.775	Mg	Sr	Zn	Cd	Si	Ge	Ge	Zr	2.728	0.908	Mg	Zn	Si	Si	Al	Ga	Sc	Y	3.251	0.826	
Be	Sr	Si	Ge	Ga	Ga	In	Sc	1.793	0.289	Sr	Zn	Si	Zr	Al	Al	In	Sc	2.344	0.705	Be	Mg	Zn	Cd	Si	Sn	Ti	Ti	2.728	0.735	Mg	Zn	Si	Hf	Al	Al	Sc	Y	3.251	0.636	
Sr	Sr	Si	Ge	Al	Ga	In	Sc	1.793	0.550	Ca	Cd	Ge	Ti	Al	In	Sc	Sc	2.344	0.863	Be	Ca	Si	Ti	Al	In	In	Sc	2.728	0.618	Mg	Zn	Si	Ti	In	Sc	Y	Y	3.251	0.487	
Ca	Zn	Sn	Hf	Ga	Ga	In	Sc	1.793	0.550	Mg	Ba	Ti	Zr	Ga	In	Y	Y	2.344	0.720	Be	Ca	Ba	Cd	Si	Zr	Zr	Hf	2.728	0.726	Be	Mg	Zr	Hf	Al	Sc	Sc	Y	3.252	0.419	
Sr	Zn	Ge	Zr	Al	Al	In	Y	1.794	0.246	Sr	Cd	Ge	Zr	In	Sc	Y	Y	2.344	0.697	Be	Mg	Sr	Zn	Si	Sn	Zn	Zr	2.728	0.662	Be	Mg	Ti	Hf	Al	Sc	Y	Y	3.252	0.416	
Sr	Ba	Zn	Cd	Si	Ge	Ge	Sn	1.794	0.372	Ca	Cd	Ti	Hf	Ga	In	In	Sc	2.344	0.685	Be	Be	Si	Sn	Al	Ga	In	Y	2.728	0.677	Mg	Ca	Si	Ti	Ga	Sc	Y	Y	3.252	0.575	
Mg	Ba	Ge	Hf	Al	In	In	Sc	1.794	0.384	Ca	Cd	Si	Ge	In	Sc	Y	Y	2.344	0.730	Be	Cd	Ge	Zr	Ga	Sc	Y	Y	2.729	0.740	Mg	Ca	Ba	Zn	Ge	Zr	Hf	Hf	3.252	0.820	
Ca	Cd	Sn	Hf	Al	Al	Ga	In	1.794	0.576	Ca	Ca	Si	Hf	Ga	In	Sc	Y	2.344	0.674	Mg	Cd	Si	Zr	Al	Al	In	Y	2.729	0.600	Be	Mg	Sr	Ba	Ge	Sn	Ti	Ti	3.253	0.723	
Cd	Cd	Sn	Hf	Al	Ga	In	Sc	1.794	0.361	Ca	Zn	Si	Ge	Al	In	Sc	Sc	2.344	0.924	Mg	Ba	Zn	Cd	Sn	Ti	Zr	Zr	2.729	0.659	Mg	Ca	Ba	Zn	Si	Ge	Sn	Zr	3.253	0.698	
Sr	Zn	Ge	Hf	Ga	Ga	Sc	Y	1.794	0.376	Sr	Zn	Ge	Hf	Al	In	Y	Y	2.344	0.794	Ca	Zn	Hf	Hf	Al	Ga	In	Sc	2.729	0.814	Be	Mg	Si	Zr	Al	Al	In	Y	3.253	0.842	
Ba	Ba	Zn	Cd	Si	Ge	Sn	Zr	1.795	0.564	Be	Sr	Zn	Cd	Si	Ge	Ti	HF	2.345	0.719	Be	Sr	Ge	Ti	Al	Al	Sc	Y	2.729	0.653	Be	Ca	Ba	Zn	Sn	Ti	Ti	Zr	3.253	0.725	
Ca	Zn	Ge	Ti	Ga	In	In	Y	1.795	0.519	Mg	Sr	Ba	Cd	Si	Si	Ge	Sn	2.345	0.889	Be	Mg	Ba	Cd	Si	Si	Sn	Ti	2.730	0.585	Mg	Ca	Ba	Zn	Ge	Ti	Hf	HF	3.253	0.526	
Cd	Cd	Ge	Zr	Al	Ga	In	Y	1.795	0.518	Be	Ba	Ba	Cd	Ge	Sn	Ti	Zr	2.345	0.754	Be	Sr	Ba	Cd	Si	Si	Zr	HF	2.730	0.687	Mg	Sr	Zn	Cd	Ti	Zr	Hf	HF	3.253	0.463	
Sr	Zn	Si	Zr	Al	In	In	Y	1.795	0.540	Ca	Ba	Si	Ti	Al	Ga	In	In	2.345	0.694	Be	Cd	Sn	Zr	Ga	Sc	Sc	Y	2.730	0.597	Be	Be	Ti	Hf	Al	Ga	In	Y	3.253	0.500	
Sr	Zn	Ge	Sn	In	Sc	Sc	Y	1.795	0.312	Be	Cd	Ge	Sn	Al	Al	Ga	Sc	2.345	0.941	Zn	Cd	Ti	Ti	Al	In	Sc	Y	2.730	0.584	Mg	Ca	Ba	Zn	Si	Ge	Ge	HF	3.253	0.589	
Sr	Sr	Sn	Ti	Al	Ga	In	Sc	1.795	0.307	Mg	Ba	Si	Ti	Ga	In	Y	Y	2.345	0.826	Sr	Cd	Si	Ti	In	Sc	Y	Y	2.730	0.699	Be	Mg	Ca	Cd	Si	Ti	Ti	Zr	3.253	0.546	
Sr	Sr	Sn	Ti	Al	Ga	Sc	Y	1.795	0.176	Be	Ba	Ca	Si	Ge	Ga	Ga	Sc	Y	2.345	0.884	Be	Be	Ba	Zn	Si	Ge	Sn	Ti	2.730	0.792	Ca	Sr	Ba	Zn	Si	Si	Ge	Zr	3.254	0.741
Mg	Sr	Ge	Sn	Ga	Sc	Y	Y	1.795	0.776	Sr	Cd	Zr	Hf	Al	Ga	Ga	In	2.345	1.266	Sr	Cd	Ge	Ti	Al	Sc	Y	Y	2.730	0.786	Be	Ca	Sr	Zn	Si	Zr	Zr	HF	3.254	1.003	
Mg	Ca	Sn	Hf	In	In	Sc	Y	1.796	0.754	Mg	Sr	Zn	Cd	Sn	Sn	Ti	Zr	2.345	1.085	Ba	Zn	Si	Ti	In	Sc	Sc	Y	2.730	0.822	Mg	Mg	Ba	Zn	Si	Sn	Ti	HF	3.255	0.867	
Sr	Cd	Ge	Hf	Al	Al	In	Sc	1.796	0.637	Mg	Cd	Si	Sn	In	Sc	Sc	Y	2.345	0.950	Zn	Cd	Ge	Zr	In	Sc	Sc	Y	2.730	0.799	Mg	Mg	Sr	Zn	Ge	Al	Ga	Sc	3.255	0.797	
Mg	Ba	Sn	Ti	Al	Ga	Ga	Y	1.796	0.605	Ca	Ca	Zn	Cd	Si	Ge	Ti	HF	2.346	0.695	Mg	Cd	Zr	Hf	Al	In	In	Sc	2.730	0.674	Mg	Cd	Ti	Zr	Al	Ga	Sc	Sc	3.255	0.622	
Sr	Ba	Zn	Cd	Si	Sn	Hf	HF	1.796	0.732	Be	Ca	Ba	Cd	Ge	Sn	Sn	HF	2.346	0.765	Be	Ca	Si	Hf	Ga	Ga	In	Sc	2.730	0.787	Be	Mg	Ca	Zn	Sn	Ti	Zr	HF	3.256	0.684	
Ba	Cd	Ge	Zr	Al	Al	Ga	Y	1.796	0.603	Ba	Ba	Zr	Hf	Ga	In	Sc	Y	2.346	0.643	Ca	Zn	Si	Si	Al	Ga	Sc	Y	2.731	0.762	Be	Mg	Ti	Hf	Al	In	In	Sc	3.256	0.622	
Ca	Cd	Ge	Hf	Al	In	In	Sc	1.796	0.438	Be	Zn	Ge	Sn	Al	Al	In	Sc	2.346	0.915	Zn	Cd	Si	Hf	Al	In	Sc	Sc	2.731	0.642	Mg	Sr	Ba	Zn	Si	Ge	Ge	Ti	3.256	0.740	
Sr	Cd	Ge	Sn	Ga	Sc	Sc	Y	1.798	0.665	Ca	Cd	Si	Ti	Ga	Ga	In	Sc	2.346	0.799	Be	Sr	Si	Ti	Al	In	Sc	Sc	2.731	0.845	Be	Ca	Zr	Hf	Al	Ga	Ga	Sc	3.256	0.707	
Ca	Cd	Zn	Hf	Ga	Ga	Sc	Y	1.798	0.535	Ca	Sr	Zn	Cd	Si	Si	Sn	Ti	2.346	0.682	Be	Sr	Si	Hf	Ga	Ga	Sc	Y	2.731	0.817	Mg	Ba	Zn	Cd	Sn	Ti	Zr	HF	3.256	0.649	
Be	Ca	Ge	Sn	Al	Ga	Y	Y	1.799	0.412	Mg	Cd	Ge	Ti	Al	Ga	Ga	In	2.347	0.782	Be	Ba	Si	Hf	Al	Al	Ga	Sc	Y	2.731	0.771	Be	Zn	Si	Ti	Ga	Ga	Sc	Y	3.256	0.680
Ca	Sr	Ge	Sn	In	Sc	Y	Y	1.799	0.654	Be	Cd	Ge	Zr	Al	Al	Ga	Y	2.347	1.006	Be	Ba	Sn	Zr	Al	Al	Ga	Ga	Y	2.732	0.847	Mg	Ca	Ba	Zn	Sn	Zr	HF	HF	3.256	0.857
Zn	Cd	Ge	Hf	Al	In	In	Y	1.799	0.524	Mg	Zn	Ge	Sn	In	Sc	Sc	Y	2.347	0.805	Sr	Ba	Ti	Hf	Al	Al	Sc	Y	2.732	0.702	Be	Cd	Ti	Hf	Al	Ga	Ga	Sc	3.257	0.735	
Be	Cd	Sn	Sn	Al	Ga	Sc	Y	1.800	0.839	Sr	Ba	Si	Zr	Ga	Ga	Ga	In	Sc	2.347	1.018	Mg	Ca	Cd	Cd	Si	Ge	Ti	HF	2.732	0.751	Be	Mg	Ti	Hf	Al	Al	In	Y	3.257	0.813
Zn	Zn	Ge	Sn	Al	In	Sc	Y	1.800	0.951	Ca	Zn	Si	Hf	Al	Ga	Ga	In	2.347	1.054	Be	Mg	Si	Sn	Al	Ga	Ga	Y	2.732	0.925	Be	Ca	Ba	Zn	Ge	Ti	Ti	HF	3.257	0.894	
Ba	Cd	Si	Si	Al	Ga	In	Y	1.800	0.615	Mg	Ba	Sn	Zr	Ga	Sc	Y	Y	2.347	0.842	Mg	Ca	Si	Hf	Ga	Ga	Sc	Y	2.732	0.756	Mg	Ca	Si	Ti	Al	Al	Ga	Sc	3.258	0.756	
Sr	Cd	Si	HF	Ga	In	In	Sc	1.800	0.698	Mg	Zn	Ge	Zr	Al	In	Y	Y	2.347	0.779	Ca	Sr	Zr	HF	In	Sc	Y	Y	2.732	0.650	Be	Zn	Si	Ge	Al	Al	Sc	Y	3.258	0.672	
Zn	Cd	Sn	Zr	Al	In	In	Sc	1.800	0.894	Ca	Cd	Si	HF	Ga	Ga	Sc	Y	2.347	0.644	Ca	Sr	Si	Ti	Al	Al	In	Sc	2.733	0.757	Be	Ca	Sr	Zn	Si	Ge	Ge	HF	3.258	0.610	
Ba	Ga	Ge	Zr	In	In	Sc	Y	1.801	0.540	Ca	Zn	Ti	HF	Ga	In	Y	Y	2.347	0.646	Ca	Ba	HF	Hf	Al	In	Sc	Y	2.733	0.695	Mg	Zn	Sn	Ti	Al	Sc	Sc	Y	3.258	0.613	
Be	Mg	Sn	In	Ga	In	Sc	Y	1.801	0.675	Sr	Zn	Zr	Zr	Al	Ga	In	Y	2.348	0.906	Mg	Ca	Si	Zr	Ga	Ga	In	Sc	2.733	0.699	Be	Be	Si	Zr	Al	In	Sc	Y	3.258	0.678	
Ba	Zn	Sn	Hf	Al	Al	Ga	Sc	1.801	0.884	Ba	Zn	Zr	Hf	Al	Al	In	Y	2.348	1.127	Be	Sr	Ti	Hf	Al	Al	Ga	Ga	Y	2.733	0.752	Be	Zn	Si	Zr	Al	Sc	Y	Y	3.259	0.852
Be	Ba	Ge	Zr	Al	Ga	In	Sc	1.801	0.528	Be	Mg	Sn	Zr	Al	In	Y	Y	2.348	1.034	Ca	Ca	Ti	HF	Al	Ga	In	Sc	2.733	0.614	Mg	Cd	Ti	Hf	Al	Al	Ga	Sc	3.259	0.774	
Sr	Sr																																							

Ca	Sr	Sn	Ti	Al	Ga	Ga	In	1.818	0.578	Ba	Cd	Ti	Hf	Al	Ga	Ga	Sc	2.357	0.848	Ca	Zn	Zr	Zr	Al	In	Sc	Y	2.744	1.047	Mg	Zn	Zn	Cd	Ge	Ti	Zr	Hf	3.281	0.928	
Be	Ca	Si	Sn	Al	Ga	In	Sc	1.818	0.327	Sr	Ba	Si	Zr	Ga	In	Y	Y	2.357	0.770	Mg	Ca	Ti	Zr	Ga	In	In	Sc	2.744	0.861	Be	Mg	Ba	Zn	Ti	Zr	Hf	Hf	3.281	0.728	
Be	Sr	Sn	Ti	Al	In	In	Sc	1.818	0.805	Zn	Cd	Sn	Zr	Al	Ga	Sc	Y	2.357	0.896	Ca	Ba	Si	Zr	Ga	Al	Sc	Y	2.745	0.681	Ca	Zn	Si	Ti	Al	Sc	Y	Y	3.281	0.538	
Ba	Ba	Ge	Zr	Ga	In	Y	Y	1.819	0.801	Ca	Cd	Si	Hf	Al	Al	Ga	In	2.357	0.758	Be	Sr	Hf	Hf	Al	Ga	In	Sc	2.745	0.803	Mg	Zn	Ge	Ti	Al	Al	Ga	Sc	3.281	0.478	
Zn	Cd	Si	Ge	Al	In	In	Sc	1.819	0.354	Be	Mg	Sn	Hf	In	In	Sc	Y	2.357	0.774	Be	Mg	Sr	Cd	Ge	Ge	Sn	Ti	2.745	0.786	Be	Mg	Zn	Cd	Si	Zr	Hf	Hf	3.281	0.517	
Mg	Cd	Sn	Ti	Al	Ga	In	In	1.819	0.668	Ca	Cd	Ti	Hf	Al	In	In	Sc	2.357	0.758	Mg	Ca	Sn	Zr	Al	Sc	Y	Y	2.745	0.800	Ca	Ba	Zn	Zn	Ge	Ti	Zr	Hf	3.282	0.673	
Be	Ba	Sn	Zr	Ga	In	Sc	Sc	1.820	0.643	Ba	Ba	Sr	Zr	Al	Sc	Sc	Y	2.357	0.792	Be	Sr	Sr	Cd	Si	Ge	Ti	Zr	2.745	0.866	Ca	Sr	Ba	Zn	Si	Ti	Zr	HF	3.282	0.911	
Be	Ba	Ge	Ti	Ga	In	In	Sc	1.820	0.763	Mg	Zn	Ge	Hf	Al	In	In	Sc	2.357	0.746	Be	Be	Sn	Hf	Al	In	Sc	Y	2.745	0.737	Be	Zn	Ge	Ti	Al	Al	Ga	Y	3.282	0.825	
Ba	Zn	Si	Sn	Al	Ga	Sc	Sc	1.820	0.664	Sr	Cd	Hf	Hf	Al	Ga	In	Sc	2.358	0.997	Be	Ca	Si	Hf	In	Sc	Y	Y	2.745	0.774	Mg	Zn	Zr	Hf	Al	Al	Ga	Y	3.282	0.794	
Mg	Ba	Ge	Zr	Ga	In	In	Sc	1.820	0.638	Ba	Zn	Si	Ti	Al	Ga	Ga	Sc	2.358	0.862	Mg	Cd	Ti	Hf	Al	Ga	Ga	Sc	2.745	0.946	Mg	Mg	Ca	Cd	Si	Ge	Ti	Hf	3.283	0.939	
Ca	Zn	Ge	Zr	Al	Ga	In	In	1.820	0.754	Ba	Ba	Zr	Zr	Ga	In	Sc	Y	2.358	0.796	Zn	Cd	Si	Ti	Ga	In	In	Y	2.745	0.796	Be	Ca	Ti	Hf	Al	Al	Ga	Sc	3.283	0.832	
Mg	Zn	Si	Sn	Ga	In	In	Sc	1.820	0.841	Be	Zn	Sn	Hf	Ga	In	In	Sc	2.358	0.915	Ca	Cd	Si	Hf	In	Sc	Y	Y	2.745	0.642	Be	Ca	Ba	Zn	Si	Ti	Zr	HF	3.283	0.571	
Mg	Cd	Sn	Zr	Al	In	In	Y	1.821	0.838	Sr	Zn	Si	Zr	Al	Al	Ga	In	2.358	0.785	Mg	Sr	Zr	Hf	Ga	Sc	Y	Y	2.745	0.757	Mg	Ca	Ba	Zn	Ge	Ge	Ti	Hf	3.284	0.516	
Mg	Ba	Si	Sn	Al	Ga	Y	Y	1.821	0.783	Sr	Cd	Zr	Hf	Al	Ga	Y	Y	2.358	0.782	Mg	Sr	Si	Hf	Al	Al	Ga	Sc	2.745	0.737	Mg	Zn	Ti	Hf	Al	Al	Ga	Y	3.284	0.616	
Ca	Cd	Ge	Ti	Ga	Ga	In	Y	1.821	0.685	Be	Sr	Sn	Ti	Al	Al	Ga	Sc	2.358	0.968	Be	Zn	Ti	Hf	Ga	In	In	Y	2.745	0.642	Mg	Cd	Ti	Zr	Ga	Sc	Sc	Y	3.284	0.636	
Sr	Cd	Si	Ti	Al	In	In	Y	1.821	0.677	Mg	Ba	Ti	Hf	Ga	In	In	Sc	2.358	0.858	Be	Be	Sn	Zr	Ga	In	In	Sc	Y	2.745	0.770	Be	Mg	Ba	Ba	Si	Ge	Sn	Hf	3.284	0.600
Mg	Ca	Si	Sn	Al	In	Y	Y	1.821	0.525	Mg	Sr	Ba	Cd	Si	Sn	Zr	Zr	2.359	0.964	Mg	Cd	Ge	Hf	Al	Al	Ga	Sc	2.746	0.922	Mg	Ca	Ba	Zn	Ge	Ti	Zr	Zr	3.285	0.847	
Zn	Cd	Sn	Zr	Al	In	Y	Y	1.821	0.576	Mg	Zn	Sn	Zr	Ga	Ga	In	Sc	2.359	1.019	Ca	Ba	Zr	Hf	Al	Al	Ga	Sc	2.746	0.926	Mg	Cd	Si	Ti	In	Sc	Sc	Y	3.285	1.094	
Ba	Cd	Ge	Zr	Al	In	Sc	Sc	1.822	0.530	Ca	Ba	Ti	Hf	Al	In	In	Sc	2.359	0.838	Zn	Cd	Ti	Zr	In	Sc	Sc	Y	2.746	0.971	Ca	Ca	Sr	Zn	Ge	Ti	Zr	HF	3.286	0.965	
Ca	Cd	Sn	Hf	Al	Al	In	Sc	1.822	0.431	Ca	Cd	Ti	Hf	Al	In	Y	Y	2.359	0.737	Mg	Sr	Ge	Ti	In	Ga	Sc	Sc	Y	2.746	0.927	Be	Ca	Zn	Cd	Si	Si	Ge	HF	3.286	0.878
Sr	Zn	Sn	Zr	Ga	In	Sc	Sc	1.822	0.786	Be	Sr	Zr	Hf	Al	In	In	Y	2.359	0.669	Be	Cd	Hf	Hf	Al	In	Sc	Y	2.746	0.812	Be	Cd	Si	Hf	Al	Sc	Sc	Y	3.287	0.723	
Mg	Ba	Ge	Hf	Ga	In	Sc	Y	1.822	0.705	Mg	Sr	Si	Ti	Ga	Ga	In	Y	2.359	0.611	Be	Sr	Sr	Cd	Si	Ge	Ti	HF	2.746	0.937	Be	Ba	Zn	Cd	Ti	Zr	Zr	HF	3.287	0.784	
Ba	Cd	Si	Sn	In	Sc	Y	Y	1.822	0.597	Be	Ba	Sn	Zi	Al	In	In	Y	2.359	0.522	Be	Cd	Ti	Zr	Ga	In	In	Sc	Y	2.746	0.890	Ca	Ba	Si	Ti	Al	Sc	Y	Y	3.288	0.703
Mg	Ca	Si	Ge	In	Sc	Y	Y	1.823	0.677	Be	Ba	Zn	Cd	Si	Sn	Sn	HF	2.360	0.914	Mg	Sr	Si	Hf	In	Sc	Y	Y	2.746	0.772	Ca	Sr	Ba	Zn	Ge	Ti	Ti	HF	3.288	0.839	
Sr	Ba	Ge	Hf	Al	Ga	Ga	In	1.824	0.661	Mg	Sr	Cd	Cd	Ge	Sn	Ti	Zr	2.360	0.662	Be	Ca	Ti	Zr	In	Sc	Y	Y	2.746	1.002	Mg	Mg	Ti	Hf	Al	Ga	Sc	Y	3.288	0.812	
Mg	Ba	Sn	Hf	Al	Ga	In	Sc	1.824	0.552	Ca	Ba	Cd	Zn	Si	Sn	Zr	HF	2.360	0.579	Be	Ba	Sn	Hf	Al	Al	Sc	Y	2.746	0.950	Be	Mg	Ba	Ba	Si	Ge	Sn	Zr	3.288	0.735	
Be	Ba	Si	Ge	Al	Ga	Ga	Y	1.824	0.653	Sr	Cd	Si	Hf	Al	Al	Ga	Sc	2.360	0.710	Ba	Ba	Zr	Hf	Al	Al	Ga	Sc	2.746	0.898	Be	Mg	Sr	Zn	Sn	Zr	Zr	HF	3.289	0.770	
Sr	Ba	Zn	Cd	Ge	Sn	Zr	Zr	1.824	0.651	Ca	Sr	Sn	Ti	In	Sc	Sc	Y	2.360	0.808	Mg	Zn	Si	Hf	Al	Ga	Y	Y	2.746	0.978	Be	Zn	Ti	Hf	Al	Al	Ga	Y	3.289	0.940	
Ca	Zn	Sn	Hf	Al	Ga	Ga	In	1.824	0.543	Mg	Ca	Si	Ge	Al	Al	Ga	In	2.360	0.683	Mg	Ca	Zn	Cd	Si	Si	Sn	Zr	2.746	0.821	Be	Sr	Sr	Zn	Si	Zr	HF	HF	3.289	0.809	
Ba	Zn	Si	Zr	In	In	Sc	Y	1.824	0.925	Sr	Ba	Si	Ge	In	Sc	Y	Y	2.360	0.971	Mg	Zn	Ge	Hf	Al	In	Sc	Y	2.746	0.869	Be	Ca	Zn	Zn	Si	Ge	Zr	HF	3.289	0.900	
Ca	Ba	Ge	Zr	Al	In	In	Sc	1.825	0.879	Zn	Zn	Si	Ge	Al	Ga	In	Sc	2.360	0.874	Be	Ca	Ba	Zn	Ge	Sn	Sn	Zr	2.747	1.062	Ca	Sr	Ba	Zn	Sn	Ti	Ti	Zr	3.290	0.983	
Ba	Zn	Ge	Zr	Al	Ga	Ga	Sc	1.825	0.632	Ba	Zn	Ge	Zr	Ga	Sc	Y	Y	2.360	0.736	Be	Cd	Sn	Ti	Al	Al	Ga	Y	2.747	0.881	Mg	Sr	Ba	Zn	Sn	Ti	Ti	HF	3.290	0.836	
Mg	Ba	Sn	Y	Zr	Al	In	Y	1.825	0.826	Ca	Sr	Ga	Ti	Al	Al	In	Sc	2.360	0.766	Ca	Ba	Zn	Zn	Ge	Sn	Zr	HF	2.747	0.712	Mg	Zn	Ti	Hf	Al	Al	Ga	Y	Y	3.290	0.710
Be	Cd	Si	Ge	Ga	In	In	Y	1.825	0.839	Be	Ba	Zn	Sr	Zr	Ga	Ga	In	Y	2.360	0.617	Be	Mg	Ge	Zr	Al	Ga	In	In	2.747	0.832	Be	Ca	Ba	Zn	Ti	Zr	HF	HF	3.290	0.656
Be	Ca	Ge	Sn	Al	In	Sc	Sc	1.825	0.579	Mg	Cd	Cd	Ge	Ti	Al	In	Y	Y	2.360	0.670	Sr	Ba	Si	Zr	Al	Al	Sc	Y	2.747	0.816	Be	Mg	Sr	Zn	Ge	Zr	Zr	HF	3.291	0.699
Be	Ba	Sn	Hf	Al	Al	Ga	In	1.825	0.804	Sr	Cd	Si	Ge	Ga	Sc	Sc	Y	2.360	0.750	Be	Sr	Ba	Cd	Ti	Ti	Zr	HF	2.747	0.820	Be	Mg	Ca	Zn	Si	Si	Sn	Zr	3.291	0.763	
Be	Cd	Sn	Zr	Al	Ga	Ga	In	1.826	0.830	Zn	Cd	Si	Zr	Al	In	In	Sc	2.361	0.849	Zn	Cd	Ti	HF	Ga	Ga	Sc	Y	2.747	0.876	Be	Mg	Si	Zr	Ga	Ga	In	Sc	3.291	0.930	
Sr	Cd	Si	Hf	In	In	Sc	Y	1.826	0.568	Be	Ca	Ba	Cd	Si	Sn	Sn	Ti	2.361	0.993	Be	Mg	Sr	Cd	Si	Sn	Zr	Zr	2.747	0.748	Mg	Ca	Ti	Zr	Al	Sc	Sc	Y	3.291	0.862	
Sr	Ba	Zn	Cd	Ge	Sn	Sn	Zr	1.826	0.687	Be	Ba	Ge	Zr	Al	Al	Ga	Sc	2.361	0.795	Be	Ba	Zr	Hf	Al	Al	Sc	Y	2.747	0.795	Be	Mg	Zn	Zn	Ge	Sn	Ti	HF	3.291	0.878	
Ca	Sr	Ge	Hf	Al	Ga	Ga	Y	1.826	0.681	Ba	Cd	Cd	Ge	Zr	Ga	Sc	Y	2.361	0.905	Ca	Ba	Zr	HF	Ga	Sc	Sc	Y	2.747	0.956	Be	Sr	Ba	Zn	Si	Si	Ge	Ti	3.291	0.964	
Ca	Ba	Si	Sn	In	Sc	Sc	Y	1.826	0.571	Sr	Ba	Zn	Zn	Si	Ge	Sn	Ti	2.361	0.833	Be	Ba	Ti	Zr	Al	Al	Ga	Y	2.747	0.808	Be	Mg	Ca	Ba	Si	Ge	Ge	Sn	3.292	0.875	
Sr	Cd	Sn	Zr	Al	Ga	Sc	Sc	1.826	0.669	Ca	Ba	Si	Hf	Al	Al	In	Y	2.361	0.809	Ba	Ba	Zr	HF	In	Sc	Sc	Y	2.747	0.667	Be	Ca	Sr	Ba	Si	Si	Ge	Sn	3.292	0.708	
Mg	Mg	Ge	Sn	Al	Ga	In	Y	1.826	0.667	Sr	Zn	Sr	Zr	Ga	Sc	Sc	Y	2.361	0.667	Ca	Zn	Ti	Zr	Al	Ga	Ga	Y	2.748	0.781	Be	Mg	Ba	Zn	Ti	Ti	Zr	HF	3.292	0.659	
Ca	Ba	Sn	Zr	Ga	In	Y	Y	1.827	0.552	Ca	Sr	Ge	Ti	Al	In	Sc	Sc	2.362	0.756	Be	Cd	Si	HF	Ga	Ga	In	Sc	2.748	0.759	Mg	Sr	Si	Ti	Al	Sc	Sc	Y	Y	3.292	0.727
Be	Ba	Ge	Zr	Al	Ga	In	In	1.827	0.737	Mg	Ca	Ge	Zr	Ga	Ga	In	Sc	2.362	0.851	Mg	Sr	Zn	Zn	Si	Sn	Zr	HF	2.748	0.666	Be	Ca	Zr	Hf	Al	Al	Ga	Sc	3.292	0.767	
Ba	Z																																							

Ba	Ba	Sn	Zr	Al	Ga	Sc	Y	1.842	0.779	Be	Cd	Sn	Hf	Ga	In	Sc	Sc	2.371	0.705	Zn	Cd	Zr	Hf	Ga	In	Sc	Sc	2.759	0.911	Be	Zn	Si	Ti	Al	Al	Ga	In	3.319	0.955	
Mg	Sr	Si	Ge	Al	Ga	Ga	Y	1.842	0.505	Sr	Zn	Zn	Cd	Si	Ge	Ti	Zr	2.371	0.927	Be	Zn	Sn	Hf	In	Sc	Sc	Y	2.759	0.937	Mg	Ca	Ba	Zn	Si	Ge	Ti	Ti	3.319	0.958	
Mg	Sr	Sn	Ti	Al	In	Ga	Y	1.842	0.533	Mg	Sr	Hf	Ga	In	In	Y	2.372	0.777	Be	Mg	Zn	Cd	Ge	Ge	Sn	Hf		2.759	1.095	Mg	Ca	Ba	Zn	Si	Ge	Ti	Zr	3.319	1.034	
Ca	Ba	Ge	Zr	Al	In	In	Sc	1.842	0.769	Mg	Sr	Ti	Zr	Al	In	In	Y	2.372	0.717	Be	Cd	Si	Hf	Al	Al	In	Y	2.759	0.958	Mg	Ca	Zn	Cd	Ti	Zr	Hf	Hf	3.319	0.959	
Ca	Cd	Ge	Zr	Al	Ga	Ga	In	1.842	0.627	Be	Ba	Zn	Cd	Cn	Sn	Ti	Zr	2.372	0.908	Be	Ba	Ba	Zn	Ge	Sn	Ti	Zr	2.759	0.774	Mg	Ca	Sr	Zn	Si	Si	Sn	Ti	3.319	0.757	
Ca	Ca	Sn	Ti	Al	Ga	In	Y	1.843	0.629	Be	Sr	Ba	Cd	Cn	Sn	Ti	Zr	2.372	0.753	Ba	Zn	Si	Ti	Ga	Sc	Y	2.760	0.886	Be	Mg	Sn	Ti	Al	Ga	Ga	Sc	3.319	0.705		
Ca	Sr	Zn	Cd	Si	Ge	Sn	Hf	1.843	0.749	Be	Sr	Ba	Ti	Hf	Ga	In	Sc	2.372	0.690	Mg	Sr	Zn	Cd	Ge	Si	Si	Sn	Ti	2.760	0.912	Be	Mg	Ca	Ba	Si	Sn	Sn	Hf	3.320	0.820
Sr	Sr	Sn	Zr	Al	Al	Ga	Y	1.843	0.304	Mg	Ca	Sn	Ti	Al	Ga	Y	Y	2.372	0.917	Mg	Zn	Sn	Hf	Al	Al	Ga	Sc	2.760	0.761	Mg	Zn	Si	Ti	Al	In	Sc	Sc	3.320	0.801	
Ina	Cd	Ge	Hf	Al	Ga	Ga	Sc	1.844	0.301	Be	Ba	Si	Zr	Ga	Ga	In	Sc	2.372	0.781	Be	Sr	Zn	Cd	Si	Ge	Hf	Hf	2.760	0.886	Mg	Sr	Ba	Zn	Si	Si	Ti	Hf	3.320	0.769	
Mg	Ca	Ge	Sn	In	Sc	Sc	Y	1.844	0.201	Mg	Sr	Cd	Zr	Zr	Ga	In	Sc	Y	2.373	0.824	Be	Sr	Sr	Cd	Si	Ge	Ti	Hf	2.760	1.070	Mg	Zn	Cd	Cd	Si	Ti	Zr	Hf	3.320	0.996
Ca	Zn	Ge	Hf	Al	In	In	Sc	1.844	0.580	Mg	Sr	Si	Ti	Al	Ga	In	In	2.373	0.914	Be	Ca	Sr	Cd	Si	Si	Sn	Hf	2.760	0.884	Be	Ca	Zn	Cd	Si	Ti	Ti	Zr	3.320	1.204	
Ca	Ca	Si	Ge	Al	Ga	Ga	In	Y	1.845	0.598	Ca	Zn	Cd	Cd	Si	Sn	Zr	Hf	2.373	0.725	Ca	Sr	Zn	Cd	Si	Zr	Zr	Hf	2.760	0.883	Mg	Sr	Ba	Zn	Si	Ti	Ti	Zr	3.320	1.073
Be	Cd	Si	Sn	Al	Ga	Ga	In	1.845	0.475	Mg	Cd	Si	Zr	Al	In	In	Y	2.373	0.704	Be	Ca	Ba	Zn	Si	Sn	Sn	Ti	2.760	0.871	Be	Mg	Ba	Zn	Zi	Ti	Ti	Hf	3.321	0.981	
Mg	Ba	Ge	Ti	Ga	In	Ga	Sc	1.846	0.566	Be	Ba	Ge	Sn	Al	In	Sc	Sc	2.373	0.696	Mg	Sr	Ti	Zr	Al	In	In	Sc	2.760	0.751	Be	Mg	Ti	Zr	Al	Al	In	Y	3.321	0.862	
Ca	Cd	Si	Ge	Al	In	Y	Y	1.846	0.604	Be	Zn	Sn	Hf	Al	In	In	Sc	2.373	0.567	Be	Mg	Ge	Ti	Al	In	Y	Y	2.761	0.819	Mg	Ca	Sr	Ba	Si	Ge	Ge	Sn	3.321	0.902	
Ba	Zn	Ge	Zr	In	In	Sc	Sc	1.846	0.469	Ca	Cd	Ti	Zr	In	In	Sc	Y	2.373	0.562	Mg	Cd	Ge	Zr	Al	Ga	Sc	Sc	2.761	0.809	Be	Mg	Ca	Ba	Ge	Sn	Hf	3.322	0.817		
Ca	Cd	Ge	Ti	Ga	In	In	Sc	1.846	0.431	Mg	Sr	Sn	Ti	Al	Ga	Sc	Sc	2.373	0.922	Be	Ba	Si	Ti	Ga	Sc	Sc	Y	2.761	0.707	Be	Mg	Ca	Zn	Ge	Ge	Sn	Ti	3.323	0.969	
Be	Ba	Ge	Ge	Al	Ga	Sc	Y	1.846	0.552	Ca	Cd	Si	Ge	Al	Ga	Sc	Sc	2.373	0.593	Sr	Sr	Ba	Zn	Ge	Sn	Zr	Hf	2.761	0.830	Be	Mg	Ge	Hf	Al	Sc	Sc	Y	3.323	0.922	
Ca	Sr	Sn	Zr	Ga	Ga	In	Sc	1.846	0.416	Mg	Cd	Si	Ti	Ga	In	In	Y	2.374	0.597	Be	Ba	Ti	Hf	Al	Ga	In	Sc	2.761	0.819	Be	Zn	Ti	Hf	Al	Ga	Ga	Y	3.323	0.841	
Be	Ba	Sn	Zr	Al	Al	In	Y	1.846	0.408	Mg	Ca	Ge	Zr	Al	Ga	Ga	In	2.374	0.722	Mg	Ba	Ti	Zr	Al	Al	In	Sc	2.761	0.846	Mg	Ca	Si	Zr	Al	Sc	Sc	Y	3.323	0.892	
Sr	Zn	Sn	Ti	Ga	Ga	Sc	Y	1.846	0.544	Sr	Ba	Hf	Hf	Al	In	Sc	Y	2.374	0.757	Ca	Ca	Ba	Cd	Cn	Ti	Zr	Hf	2.761	0.915	Be	Be	Mg	Zn	Si	Sn	Ti	Hf	3.324	1.043	
Sr	Cd	Sn	Zr	Al	Al	Ga	Sc	1.847	0.408	Zn	Zn	Ge	Hf	Al	In	Sc	Y	2.374	0.733	Ca	Cd	Ge	Hf	Al	Al	Sc	Y	2.761	0.788	Mg	Cd	Ti	Zr	Al	Al	Ga	Sc	3.324	0.925	
Ca	Ba	Ge	Sr	Al	Ga	Ga	Y	1.847	0.797	Be	Ca	Si	Ge	In	Sc	Y	Y	2.374	0.963	Sr	Zn	Si	Ti	In	Sc	Y	Y	2.761	0.813	Be	Mg	Mg	Zn	Ge	Sn	Zr	Hf	3.324	1.013	
Be	Sr	Ge	Sn	Al	Al	Sc	Y	1.847	0.787	Ca	Sr	Zr	Hf	Ga	Ga	In	Y	2.374	0.797	Ca	Sr	Ba	Cd	Si	Si	Ti	Hf	2.761	0.944	Mg	Ca	Ca	Zn	Ge	Sn	Ti	Zr	3.325	1.078	
Sr	Ba	Ge	Ti	Al	In	In	Sc	1.847	0.438	Mg	Sr	Ba	Cd	Si	Sn	Sn	Zr	2.375	0.762	Cd	Cd	Si	Ti	Al	Ga	Sc	Y	2.761	0.796	Mg	Ca	Ba	Zn	Si	Si	Zr	Hf	3.325	0.944	
Ca	Sr	Si	Ge	Ga	In	Y	Y	1.847	0.685	Be	Ba	Ba	Cd	Si	Sn	Ti	Hf	2.375	0.932	Mg	Ca	Si	Ti	Al	In	Y	Y	2.761	0.747	Be	Mg	Ti	Zr	In	Sc	Sc	Y	3.325	0.799	
Be	Sr	Ge	Hf	Ga	In	Y	Y	1.847	0.746	Sr	Cd	Ti	Hf	Ga	Ga	Sc	Y	2.375	0.772	Be	Zn	Si	Ge	Ga	Ga	Sc	Y	2.761	0.820	Mg	Ca	Ca	Zn	Si	Sn	Ti	Zr	3.325	0.745	
Mg	Sr	Ge	Zr	In	In	Sc	Y	1.848	0.379	Be	Sr	Ba	Cd	Cn	Sn	Ti	Hf	2.375	0.760	Be	Cd	Sn	Hf	Al	Al	Sc	Sc	Y	2.761	0.743	Be	Mg	Sr	Zn	Sn	Ti	Hf	Hf	3.325	0.826
Sr	Sr	Zn	Cd	Si	Ge	Sn	Hf	1.848	0.665	Sr	Zn	Zr	Hf	Ga	In	In	Sc	2.375	0.723	Mg	Ca	Sr	Cd	Si	Sn	Ti	Ti	2.762	0.781	Be	Mg	Ba	Zn	Sn	Ti	Ti	Hf	3.325	0.867	
Zn	Cd	Ge	Zr	Ga	In	In	Y	1.848	0.738	Ca	Sr	Si	Ti	Al	Ga	Ga	Y	2.375	0.759	Be	Ba	Ba	Zn	Ge	Sn	Ti	Hf	2.762	0.824	Be	Mg	Ca	Zn	Sn	Sn	Ti	Zr	3.325	1.016	
Sr	Ba	Si	Ge	Ga	In	Y	Y	1.848	0.370	Mg	Zn	Sn	Ti	Al	Ga	In	Sc	2.375	0.722	Mg	Sr	Ba	Ba	Zn	Sn	Zr	Hf	2.762	0.689	Mg	Zn	Ti	Hf	Al	Al	Sc	Y	3.326	0.965	
Ba	Cd	Si	Ti	Ga	In	In	Sc	1.848	0.525	Zn	Cd	Sn	Hf	Ga	Sc	Y	Y	2.375	0.947	Mg	Sr	Ba	Cd	Si	Ge	Ge	Hf	2.762	0.753	Mg	Sr	Ba	Zn	Si	Si	Ti	Zr	3.326	0.974	
Be	Cd	Si	Sn	Al	In	In	Sc	1.848	0.555	Be	Cd	Zr	Hf	Ga	In	Y	Y	2.375	0.791	Be	Cd	Sn	Ti	Al	Sc	Y	Y	2.762	0.851	Mg	Ca	Sr	Zn	Sn	Ti	Hf	Hf	3.326	1.042	
Ba	Cd	Si	Hf	Al	In	Y	Y	1.848	0.310	Ba	Zn	Si	Hf	Al	Al	Sc	Y	2.375	0.733	Ca	Cd	Zr	Zr	Al	Ga	Sc	Y	2.762	0.696	Be	Mg	Ti	Hf	Ga	In	Sc	Sc	3.326	0.971	
Sr	Sr	Zn	Cd	Ge	Sn	Zr	Hf	1.848	0.509	Sr	Ba	Ti	Hf	Ga	In	Y	Y	2.375	0.937	Be	Ca	Sr	Cd	Ge	Zr	Hf	Hf	2.762	0.720	Be	Mg	Ca	Ba	Si	Sn	Sn	Zr	3.327	0.781	
Ca	Zn	Ge	Ti	Al	In	In	Y	1.848	0.546	Be	Ba	Si	Ti	Al	Ga	Ga	In	2.375	0.784	Be	Cd	Ti	Zr	Ga	Ga	In	Y	2.762	0.786	Ca	Sr	Sr	Ba	Ge	Sn	Zr	Hf	3.327	0.731	
Ba	Zn	Si	Zr	Ga	In	In	Sc	1.849	0.294	Ca	Ba	Si	Zr	Ga	In	Y	Y	2.375	0.715	Be	Ca	Ge	Ti	In	Sc	Sc	Y	2.762	0.659	Mg	Sr	Ba	Zn	Zr	Zr	Hf	Hf	3.327	0.841	
Zn	Cd	Sn	Hf	Al	Al	In	Y	1.849	0.652	Be	Zn	Ge	Hf	Al	In	In	Y	2.376	0.945	Mg	Ba	Si	Ti	Al	Ga	Y	Y	2.762	0.687	Be	Mg	Ti	Ti	Al	In	Sc	Y	3.327	0.825	
Be	Ca	Sn	Hf	Al	In	In	Y	1.849	0.656	Be	Ba	Si	Ti	Al	In	Y	Y	2.376	0.811	Be	Mg	Ba	Cd	Si	Ge	Ge	Zr	2.762	0.766	Mg	Zn	Si	Hf	Al	Sc	Y	Y	3.327	0.794	
Mg	Ba	Zn	Cd	Si	Ge	Sn	Sn	1.849	0.254	Mg	Ca	Ge	Hf	Ga	Ga	Sc	Y	2.376	0.846	Ca	Zn	Cd	Cd	Ge	Ti	Zr	Hf	2.762	0.818	Be	Zn	Si	Hf	Al	Al	Ga	Y	3.328	1.013	
Ba	Cd	Ge	Ti	Ga	Ga	Sc	Y	1.849	0.919	Mg	Ba	Ge	Zr	In	Sc	Sc	Y	2.376	0.957	Zn	Cd	Ti	Hf	Al	Ga	Ga	Y	2.762	0.885	Be	Sr	Zn	Zn	Si	Ge	Ti	Zr	3.328	1.005	
Ba	Ba	Ge	Hf	Al	Ga	In	Sc	1.849	0.895	Mg	Ba	Sn	Ti	Ga	Sc	Sc	Y	2.376	0.763	Mg	Sr	Sr	Cd	Ge	Ti	Zr	Hf	2.763	0.884	Be	Ca	Ba	Zn	Si	Si	Ge	Zr	3.328	0.847	
Ca	Ba	Sn	Hf	Ga	In	Sc	Sc	1.850	0.680	Zn	Cd	Sn	Ti	Al	Al	Ga	Y	2.376	0.752	Mg	Zn	Si	Zr	Al	In	In	Sc	2.763	0.875	Be	Mg	Ti	Zr	Ga	Ga	Sc	Y	3.328	0.792	
Be	Zn	Ge	Sn	Al	In	Y	Y	1.850	0.807	Mg	Sr	Ge	Ti	Al	Al	Ga	Y	2.376	0.738	Ba	Zn	Ti	Zr	Ga	Sc	Y	Y	2.763	0.771	Be	Mg	Zn	Cd	Si	Ti	Zr	Zr	3.328	0.627	
Ca	Cd	Ge	Ge	Al	Ga	Ga	Y	1.850	0.860	Ca	Cd	Sn	Hf	Ga	Sc	Y	Y	2.376	0.606	Be	Zn	Cd	Cd	Si	Ge	Sn	Zr	2.763	0.828	Be	Mg	Ca	Ba	Ge	Sn	Sn	Zr	3.329	0.659	
Mg	Ba	Ge	Zr																																					

Sr	Sr	Ge	Hf	Ga	In	Sc	Y	1.866	0.383	Sr	Sr	Zr	Hf	Ga	In	Sc	Y	2.387	0.997	Ca	Zn	Ti	Ti	Al	In	Sc	Y	2.770	0.754	Be	Zn	Si	Hf	Al	Ga	Sc	Sc	3.358	0.703		
Be	Sr	Ge	Hf	Ga	In	In	Sc	1.866	0.382	Ca	Ba	Ge	Hf	Al	Al	Sc	Y	2.387	0.918	Be	Be	Ba	Cd	Sn	Ti	Zr	Hf	2.770	0.717	Mg	Mg	Zr	Hf	Al	Ga	In	Sc	3.358	0.631		
Ca	Ba	Sn	Hf	Al	In	In	Sc	1.866	0.285	Be	Sr	Ti	Hf	Al	Ga	In	In	2.387	1.101	Ca	Sr	Ba	Cd	Cd	Si	Si	Ti	Zr	2.771	1.020	Ca	Sr	Ba	Hf	Ga	Sc	Sc	Y	3.358	0.696	
Be	Mg	Sn	Sn	Al	Al	Ga	In	Y	0.694	Zn	Cd	Si	Hf	Al	Ga	Ga	Sc	2.387	1.005	Sr	Ba	Si	Hf	In	Al	Sc	Y	Y	2.771	1.261	Be	Mg	Mg	Cd	Ga	Ti	Ti	Hf	3.358	0.299	
Sr	Ba	Sn	Zr	Al	Al	In	Y	1.866	0.710	Zn	Cd	Si	Sn	Al	Sc	Y	Y	2.387	0.835	Ca	Zn	Si	Ti	Zr	Al	Al	Ga	In	2.771	1.122	Be	Mg	Si	Hf	Al	Ga	Sc	Y	Y	3.358	0.387
Ba	Zn	Ge	Ti	Al	Al	In	Y	1.866	0.589	Cd	Cd	Si	Hf	Al	In	In	Sc	Y	2.387	0.761	Be	Ba	Zr	Hf	Al	Ga	Sc	Sc	2.771	1.012	Mg	Mg	Ti	Zr	Al	Ga	Sc	Y	3.358	0.277	
Mg	Cd	Sn	Hf	Ga	In	In	Y	1.866	0.671	Sr	Ba	Sn	Hf	Hf	Ga	Sc	Y	Y	2.387	0.549	Ca	Cd	Ge	Ti	Ga	Sc	Y	Y	2.771	0.810	Be	Mg	Sr	Ba	Ge	Sn	Hf	3.359	0.388		
Ba	Zn	Ge	Zr	Al	Al	In	Y	1.866	0.718	Be	Cd	Ge	Ti	Al	In	Y	Y	2.388	0.586	Ca	Zn	Zr	Hf	Ga	Sc	Sc	Y	2.772	0.924	Mg	Ca	Sr	Zn	Sn	Ti	Zr	Zr	3.359	0.539		
Ca	Ca	Sn	Zr	Ga	In	In	Sc	Y	0.585	Ca	Sr	Si	Ge	Al	Ga	Sc	Sc	2.388	0.525	Ca	Sr	Si	Zr	In	Sc	Sc	Y	2.772	0.814	Be	Be	Mg	Zn	Sn	Ti	Zr	Hf	3.360	0.492		
Be	Ba	Ge	Zr	Al	In	In	Sc	1.866	0.530	Ca	Sr	Sn	Zr	Ga	Sc	Sc	Y	2.388	0.743	Mg	Ca	Zr	Hf	Al	Ga	In	In	2.772	0.960	Be	Mg	Ca	Sr	Si	Sn	Hf	3.360	0.577			
Ca	Cd	Sn	Zr	Ga	Ga	Sc	Y	1.867	0.665	Mg	Sr	Sn	Ti	In	Sc	Y	Y	2.388	0.613	Mg	Cd	Si	Hf	Ga	Ga	Sc	Y	2.772	0.996	Be	Mg	Sr	Zn	Sn	Ti	Zr	Zr	3.360	0.507		
Sr	Ba	Si	Ge	Al	Al	In	Y	1.867	0.531	Mg	Ca	Si	Zr	In	In	Sc	Y	2.388	0.559	Ca	Cd	Ti	Zr	Al	Al	Ga	Sc	Y	2.773	0.886	Mg	Ca	Si	Ti	Al	Al	Sc	Y	3.360	0.606	
Ca	Cd	Sn	Ti	Al	Ga	Ga	Y	1.867	0.506	Be	Sr	Si	Ti	Al	In	In	Sc	2.388	0.622	Be	Ca	Ba	Cd	Ge	Ge	Ti	Zr	2.773	0.876	Be	Be	Si	Ge	Al	Ga	In	Sc	3.361	0.754		
Sr	Ba	Cd	Cd	Si	Ge	Zr	Hf	1.868	0.656	Be	Mg	Sn	Ti	Ga	In	Y	Y	2.388	0.801	Mg	Zn	Si	Sn	Al	Sc	Y	Y	2.773	1.114	Be	Be	Mg	Zn	Si	Sn	Ti	Zr	3.361	0.253		
Be	Cd	Ge	Sn	Ga	In	In	Sc	1.868	0.522	Sr	Ba	Ti	Zr	Al	Ga	Ga	Y	2.389	0.674	Mg	Sr	Ba	Cd	Si	Ge	Ge	Zr	2.773	0.933	Be	Mg	Sr	Zn	Si	Si	Ge	Hf	3.361	0.358		
Mg	Ba	Si	Ge	Al	Al	Ga	In	1.869	0.897	Ba	Zn	Ti	Zr	Ga	Ga	Sc	Y	2.389	0.832	Be	Zn	Si	Zr	In	In	Sc	Y	2.773	1.040	Mg	Cd	Si	Ti	Al	Al	Ga	Sc	3.362	0.378		
Sr	Cd	Ge	Sn	Al	Al	In	Sc	1.869	0.898	Be	Mg	Mg	Sn	Ga	Sc	Y	Y	2.389	0.844	Mg	Sr	Zn	Cd	Sn	Ti	Hf	Hf	2.773	1.203	Be	Zn	Zn	Cd	Ga	Ti	Zr	Hf	3.362	0.450		
Be	Sr	Si	Sn	Ga	Sc	Sc	Y	1.869	0.556	Ca	Zn	Zr	Hf	Ga	In	In	Y	2.389	0.703	Ba	Zn	Ti	Zr	In	Sc	Sc	Y	2.773	1.002	Be	Ca	Zn	Cd	Cd	Si	Si	Ti	3.362	0.534		
Ca	Ba	Sn	Zr	Al	In	Y	Y	1.869	0.779	Mg	Ca	Sn	Hf	Al	Al	Ga	Sc	2.389	0.711	Mg	Ba	Zn	Cd	Sn	Ti	Hf	Hf	2.773	0.767	Be	Ca	Sr	Zn	Ga	Ti	Ti	Hf	3.363	0.371		
Ca	Ba	Sn	Hf	Al	Al	In	Sc	1.869	0.855	Be	Cd	Sn	Zr	In	Sc	Y	Y	2.389	0.592	Mg	Cd	Ti	Ti	Al	Ga	In	Y	2.773	0.719	Mg	Ca	Sr	Zn	Sn	Zr	Zr	Hf	3.363	0.478		
Zn	Cd	Sn	Ti	Al	Ga	Ga	In	1.869	0.496	Zn	Cd	Sn	Zr	Al	Al	Sc	Y	2.389	0.556	Be	Mg	Sr	Zn	Ge	Sn	Sn	Zr	2.774	0.782	Mg	Ca	Ca	Zn	Si	Ge	Zr	Hf	3.364	0.557		
Be	Sr	Ge	Hf	Al	Ga	In	In	1.869	0.758	Sr	Zn	Ge	Ti	Al	Al	Ga	Sc	2.389	0.667	Mg	Zn	Si	Ti	Al	Ga	Ga	In	Y	2.774	0.998	Be	Mg	Sr	Ba	Ge	Ga	Zr	Hf	3.364	0.606	
Sr	Sr	Zn	Cd	Si	Ge	Sn	Zr	1.869	0.848	Zn	Zn	Ge	Zr	Al	Ga	In	Sc	2.389	0.845	Mg	Ba	Ti	Ti	Al	Ga	Sc	Sc	Y	2.774	1.224	Mg	Ca	Sr	Zn	Ge	Zr	Zr	Hf	3.364	0.660	
Ca	Zn	Ge	Hf	Al	In	Y	Y	1.870	0.487	Zn	Cd	Si	Ge	Al	In	Sc	Sc	2.389	0.760	Ca	Cd	Ti	Zr	Al	In	Sc	Sc	2.774	1.137	Be	Ba	Mg	Si	Hf	Al	Ga	Sc	3.365	0.396		
Sr	Ba	Ge	Ti	In	In	In	Sc	Y	1.870	0.618	Be	Ba	Si	Si	Al	Ga	In	Sc	2.389	0.860	Be	Cd	Zr	Zr	Al	Ga	In	Y	2.774	1.151	Be	Ca	Si	Ti	Al	Al	Ga	Sc	3.365	0.502	
Be	Sr	Sn	Hf	Ga	Ga	Ga	In	Sc	1.870	0.652	Sr	Ba	Hf	Hf	Al	Ga	In	Y	2.390	0.879	Mg	Mg	Ba	Cd	Si	Sn	Zr	Hf	2.774	1.302	Mg	Mg	Ba	Zn	Si	Ge	Zr	Hf	3.365	0.589	
Ba	Ba	Ge	Hf	Al	Al	In	Sc	Y	1.871	0.416	Mg	Ba	Zn	Cd	Ge	Sn	Ti	Ti	2.390	0.775	Mg	Sr	Ba	Zn	Si	Sn	Hf	Hf	2.774	1.197	Mg	Mg	Sr	Zn	Ge	Sn	Ti	Hf	3.366	0.636	
Sr	Ba	Sn	Zr	Ga	In	In	Sc	Sc	1.871	0.601	Sr	Ba	Ge	Zr	In	In	Sc	Y	2.390	0.763	Mg	Zn	Si	Ti	In	In	Sc	Y	2.774	0.895	Be	Mg	Ca	Sr	Ge	Sn	Hf	3.366	0.686		
Ba	Cd	Ge	Hf	Al	Al	Ga	Sc	1.871	0.642	Sr	Cd	Ge	Zr	Al	Sc	Y	Y	2.390	0.651	Zn	Zn	Zr	Hf	Al	In	In	Sc	Y	2.774	0.849	Mg	Zn	Si	Hf	Ga	Sc	Sc	Y	3.367	0.610	
Be	Ba	Ge	Ti	Al	Ga	In	In	1.871	0.401	Sr	Cd	Ge	Hf	Ga	Sc	Y	Y	2.390	0.619	Mg	Ba	Zn	Zn	Ge	Sn	Ti	Zr	2.775	0.985	Mg	Zn	Si	Ti	Ga	Sc	Y	Y	3.368	0.700		
Ca	Sr	Ge	Ge	In	Ga	Sc	Y	1.871	0.740	Be	Sr	Ti	Zr	Al	In	In	Y	2.390	0.830	Be	Ca	Ge	Zr	Ga	Sc	Sc	Y	2.775	0.962	Ca	Ca	Sr	Sr	Ba	Si	Sn	Zr	Hf	3.368	0.644	
Sr	Zn	Si	Hf	Ga	In	Y	Y	1.872	0.744	Ca	Sr	Zn	Cd	Si	Si	Zr	Hf	2.390	0.877	Ca	Ca	Ti	Hf	Al	Ga	Sc	Y	2.775	0.933	Be	Sr	Zn	Zn	Ge	Ti	Zr	Hf	3.369	0.734		
Mg	Zn	Si	Sn	In	In	In	Sc	Y	1.872	0.355	Ca	Zn	Ge	Ti	Ga	In	Sc	2.390	0.855	Be	Zn	Ge	Zr	In	Sc	Y	Y	2.775	1.211	Mg	Mg	Ca	Zn	Ga	Sn	Zr	Hf	3.369	0.876		
Zn	Cd	Sn	Ti	Ga	In	In	Sc	1.872	1.018	Mg	Ba	Ti	Ti	Ga	In	Sc	Y	2.390	1.026	Be	Cd	Ge	Hf	In	Sc	Sc	Y	2.775	0.780	Be	Ca	Sr	Zn	Si	Si	Zr	Hf	3.369	0.349		
Sr	Ba	Sn	Zr	Al	In	In	Sc	1.872	1.005	Ba	Ba	Si	Hf	Al	Ga	Sc	Y	2.391	0.866	Be	Ca	Ge	Hf	Al	Al	Ga	Sc	Y	2.775	0.656	Be	Mg	Ca	Sr	Si	Sn	Zr	Hf	3.369	0.459	
Sr	Ce	Ge	Zr	Ga	In	In	Sc	1.872	0.795	Mg	Ba	Si	Si	Al	Ga	Ga	In	2.391	0.829	Be	Cd	Ti	Hf	Al	Ga	Ga	In	2.775	0.571	Be	Ca	Ba	Zn	Si	Ti	Hf	3.369	0.493			
Mg	Cd	Ge	Sn	Al	Ga	Ga	Sc	1.872	0.901	Ca	Ba	Si	Si	Al	In	Sc	Y	2.391	0.723	Be	Ca	Ba	Cd	Cd	Si	Ge	Ge	Zr	2.775	0.472	Mg	Ca	Sr	Zn	Ge	Ti	Zr	Zr	3.369	0.555	
Sr	Zn	Zn	Cd	Si	Ge	Sn	Zr	1.872	0.968	Ca	Cd	Si	Hf	Ga	In	In	Sc	2.391	0.686	Mg	Sr	Ge	Hf	Al	Sc	Y	Y	2.775	0.534	Be	Zn	Si	Ge	Al	Al	Ga	Sc	3.370	0.633		
Ca	Ba	Ge	Hf	Al	Ga	In	In	1.873	0.743	Sr	Zn	Ti	Zr	Al	Ga	Y	Y	2.391	0.663	Be	Zn	Ti	Zr	Al	Ga	In	In	2.776	0.448	Be	Zn	Cd	Cd	Ge	Ti	Zr	Hf	3.370	0.456		
Cd	Cd	Sn	Zr	Al	In	Ga	Sc	Y	1.874	0.880	Ca	Sr	Ge	Zr	Al	Ga	Sc	2.391	0.915	Zn	Cd	Si	Hf	Al	Al	Ga	Y	2.776	0.634	Ca	Ca	Sr	Ba	Sn	Ti	Zr	Hf	3.370	0.567		
Mg	Sr	Sn	Ti	Al	In	Ga	Ga	In	1.874	0.961	Be	Mg	Si	Zr	Hf	Ga	In	In	Sc	2.391	0.721	Be	Mg	Si	Ge	Al	In	In	Sc	2.776	0.630	Mg	Ca	Sr	Zn	Ge	Ga	Ti	Zr	3.370	0.659
Be	Ca	Ba	Cd	Si	Ge	Sn	Sn	1.874	0.734	Ba	Cd	Ti	Zr	Al	In	In	Sc	2.391	0.704	Sr	Zn	Zr	Hf	Al	Al	Sc	Y	2.776	0.542	Be	Mg	Ba	Ge	Sn	Zr	Hf	3.370	0.699			
Ba	Zn	Sn	Ti	Al	Al	Ga	Y	1.874	0.733	Be	Ca	Si	Zr	In	In	Sc	Y	2.392	0.773	Be	Sr	Si	Hf	Al	Ga	Sc	Sc	2.776	0.518	Be	Zn	Zr	Hf	Al	Ga	Sc	Sc	3.370	0.747		
Ca	Ba	Sn	Ti	Ga	Ga	In	Sc	1.874	0.772	Ca	Sr	Si	Hf	Al	Al	In	Y	2.392	0.872	Be	Cd	Sn	Ti	Al	Ga	Ga	Sc	2.776	0.691	Mg	Ca	Ba	Zn	Si	Ge	Ga	Ti	3.370	0.479		
Ca	Ba	Zn	Cd	Sn	Sn	Zr	Hf	1.875	0.687	Ba	Zn	Sn	Ti	Ga	Sc	Sc	Y	2.392	0.802	Be	Zn	Si	Ge	Al	Al	In	Y	2.777	0.550	Mg	Ca	Ba	Ba	Sn	Sn	Zr	Hf				

Sr	Cd	Sn	Ti	Al	In	Sc	Sc	1.888	0.686	Mg	Zn	Si	Ge	Ga	In	Sc	2.402	0.679	Mg	Zn	Ti	Hf	In	In	Sc	Y	2.786	1.085	Be	Mg	Ge	Zr	Al	Sc	Sc	Y	3.402	0.676		
Be	Ba	Ge	Hf	Al	In	Y	Y	1.889	0.543	Be	Ba	Zn	Cd	Si	Sn	Ti	2.402	0.600	Mg	Ca	Si	Si	Al	Ga	In	Sc	2.786	0.957	Be	Mg	Ge	Hf	Al	Al	Ga	Sc	3.402	0.603		
Sr	Ba	Ge	Hf	Al	Al	Ga	Y	1.889	0.553	Be	Ba	Zn	Cd	Ge	Sn	Zr	2.402	0.844	Mg	Ca	Cd	Hf	In	Sc	Y	Y	2.786	1.106	Zn	Cd	Si	Ti	Al	Sc	Sc	Y	3.402	0.707		
Sr	Cd	Si	Si	Al	Ga	In	Y	1.889	0.656	Ba	Cd	Zr	Hf	Al	Ga	In	2.402	0.712	Ca	Sr	Ba	Zn	Si	Sn	Zr	Zr	2.787	1.164	Mg	Ca	Ba	Zn	Si	Si	Ge	Hf	3.402	0.654		
Sr	Cd	Si	Zr	In	In	Sc	Y	1.889	0.511	Sr	Zn	Hf	Hf	Ga	In	Sc	2.402	0.639	Mg	Sr	Si	Si	Al	Ga	Sc	Y	2.787	1.035	Be	Ca	Sr	Zn	Ti	Zr	Hf	Hf	3.402	0.766		
Zn	Cd	Sn	Hf	Ga	Ga	In	Sc	1.889	0.535	Be	Ba	Sn	Hf	Al	Ga	Sc	2.402	0.713	Mg	Cd	Zr	Hf	Al	Ga	Ga	In	2.787	1.018	Be	Mg	Si	Zr	Al	Ga	Ga	In	3.402	0.714		
Mg	Ba	Sn	Zr	Al	Al	Ga	In	1.890	0.650	Mg	Ba	Si	Zr	Al	In	Y	2.402	0.879	Sr	Ba	Ti	Zr	In	Sc	Y	Y	2.787	1.258	Be	Mg	Zr	Hf	Ga	Ga	In	Sc	3.402	0.616		
Mg	Sr	Ba	Cd	Si	Ge	Sn	Sn	1.890	0.506	Zn	Cd	Ge	Hf	Al	Ga	Sc	2.402	0.743	Mg	Ba	Zn	Cd	Ge	Ti	Zr	Zr	2.787	1.068	Be	Mg	Sr	Ba	Si	Sn	Ti	Zr	3.403	0.721		
Mg	Ca	Sn	Hf	Ga	Ga	In	Y	1.890	0.882	Mg	Ba	Ge	Zr	Al	Ga	Sc	2.402	0.922	Sr	Zn	Ti	Zr	Al	Al	Sc	Y	2.787	1.175	Mg	Zn	Ba	Zr	Hf	Al	Ga	Sc	3.403	0.676		
Ca	Sr	Ge	Zr	Al	Ga	Ga	Y	1.890	0.860	Mg	Sr	Cd	Cd	Si	Ge	Sn	Ti	2.402	0.927	Mg	Ca	Ba	Cd	Si	Si	Sn	Ti	2.787	1.353	Be	Ba	Zn	Zn	Si	Ti	Zr	Hf	3.403	0.725	
Be	Ca	Sn	Zr	In	In	Sc	Y	1.890	0.508	Be	Ca	Ge	Hf	Al	Al	In	Y	2.402	0.778	Be	Sr	Si	Si	Al	Ga	Sc	Y	2.787	1.144	Be	Ca	Zn	Cd	Ti	Zr	Hf	Hf	3.404	0.728	
Ba	Cd	Ge	Sn	Al	Sc	Y	Y	1.890	0.797	Mg	Sr	Ba	Cd	Ge	Sn	Zr	2.402	0.753	Be	Ca	Zn	Cd	Ge	Ge	Sn	Ti	2.787	0.854	Mg	Zn	Si	Ti	Al	Al	Ga	Y	3.404	0.414		
Be	Cd	Sn	Hf	Ga	In	Sc	Y	1.891	0.840	Sr	Zn	Si	Ge	Al	Al	Sc	Y	2.402	0.638	Ca	Zn	Zr	Hf	Al	Ga	Ga	Y	2.787	0.818	Be	Zn	Si	Ti	Al	Ga	Sc	Y	3.404	0.479	
Be	Sr	Ge	Ti	In	In	Sc	Y	1.891	0.472	Ca	Ba	Si	Hf	Ga	In	Sc	Sc	2.402	0.644	Ca	Zn	Cd	Cd	Si	Ti	Zr	Hf	2.787	0.922	Be	Mg	Ba	Ge	Sn	Ti	Hf	3.405	0.414		
Mg	Sr	Si	Sn	Al	Ga	Y	Y	1.891	0.781	Mg	Ca	Sn	Ti	Al	Al	Ga	Y	2.403	0.751	Be	Sr	Sr	Zn	Si	Sn	Zr	Hf	2.787	1.138	Mg	Ca	Sr	Zn	Si	Ge	Ti	Ti	3.405	0.479	
Ca	Ba	Sn	Ti	Al	Al	In	Y	1.891	0.836	Be	Cd	Ge	Zr	Al	Ga	Y	Y	2.403	0.917	Mg	Cd	Zr	Hf	Al	Al	In	Y	2.787	1.366	Mg	Ca	Ba	Zn	Sn	Ti	Ti	Hf	3.405	0.488	
Ca	Ba	Cd	Cd	Si	Sn	Zr	Hf	1.891	0.466	Be	Ca	Si	Hf	Al	In	In	Y	2.403	0.842	Zn	Cd	Ti	Hf	Ga	Sc	Y	Y	2.787	1.289	Be	Mg	Sr	Ba	Si	Si	Sn	Hf	3.406	0.429	
Ca	Ba	Ge	Hf	Al	Ga	Ga	In	1.891	0.591	Sr	Ba	Zr	Zr	Ga	In	Sc	Y	2.403	0.944	Mg	Zn	Sn	Hf	In	Sc	Sc	Y	2.787	1.284	Be	Ca	Si	Ti	Al	Sc	Sc	Y	3.407	0.493	
Ca	Zn	Sn	Zr	Al	Ga	Ga	In	1.891	0.622	Mg	Sr	Si	Hf	Al	Ga	Ga	Y	2.403	0.956	Be	Mg	Zn	Cd	Ge	Ge	Sn	Zr	2.787	1.451	Be	Mg	Si	Ti	Ga	Sc	Y	Y	3.407	0.437	
Mg	Zn	Sn	Sn	Al	Ga	Sc	Y	1.891	0.419	Ca	Zn	Ti	Zr	Ga	In	Y	Y	2.403	0.862	Be	Ba	Zn	Zn	Si	Sn	Zr	Hf	2.788	1.355	Be	Cd	Si	Ti	Al	Al	Sc	Y	3.408	0.499	
Ba	Cd	Si	Ti	Al	In	In	Sc	1.891	0.578	Be	Cd	Ge	Ti	Ga	In	In	Sc	2.403	0.798	Be	Mg	Sr	Cd	Sn	Sn	Ti	Hf	2.788	0.980	Mg	Ca	Sr	Zn	Si	Si	Zr	Hf	3.408	0.504	
Sr	Cd	Si	Sn	In	Sc	Y	Y	1.891	0.616	Sr	Sr	Ti	Zr	Ga	In	Sc	Y	2.403	0.690	Zn	Zn	Ti	Zr	Al	In	In	Sc	Y	2.788	0.946	Be	Ca	Zn	Ge	Ti	Zr	Hf	3.409	0.476	
Ca	Sr	Ge	Hf	Al	Ga	In	In	1.891	0.407	Mg	Zn	Si	Ge	Al	Ga	Ga	In	2.404	0.719	Ca	Sr	Si	Ge	Al	Sc	Y	Y	2.788	1.141	Be	Mg	Ca	Zn	Ge	Zr	Hf	Hf	3.409	0.513	
Sr	Ba	Cd	Cd	Si	Sn	Ti	Zr	1.892	0.697	Sr	Zn	Sn	Ti	In	Sc	Sc	Y	2.404	0.865	Be	Zn	Si	Ti	Al	Ga	In	In	2.788	1.049	Be	Mg	Si	Ti	Ga	Ga	Sc	Y	3.409	0.454	
Ca	Ca	Si	Ge	Ga	In	Sc	Y	1.892	0.701	Be	Sr	Ba	Cd	Si	Sn	Ti	Ti	2.404	0.778	Be	Ca	Si	Zr	Zr	Ga	Ga	In	Sc	2.788	1.032	Mg	Zn	Si	Ti	Al	Ga	Ga	Sc	3.409	0.512
Sr	Sr	Ge	Hf	Al	In	Sc	Y	1.892	0.369	Be	Cd	Si	Hf	Ga	In	In	Y	2.404	0.945	Be	Mg	Sn	Zr	Zr	Ga	Sc	Y	Y	2.788	1.359	Mg	Sr	Ba	Zn	Si	Si	Ge	Ti	3.409	0.510
Mg	Sr	Si	Sn	In	Sc	Y	Y	1.892	1.009	Sr	Zn	Ti	Hf	Al	Ga	Ga	Y	2.404	1.099	Be	Ca	Si	Zr	Al	Ga	Y	Y	2.788	0.906	Be	Be	Mg	Zn	Ge	Ti	Zr	Hf	3.410	0.715	
Sr	Ba	Zn	Cd	Ge	Ge	Sn	Hf	1.892	0.973	Mg	Ba	Ti	Hf	Al	In	Y	Y	2.404	0.944	Ca	Cd	Si	Zr	Al	Al	Sc	Y	2.788	0.791	Be	Mg	Zn	Si	Hf	Al	Ga	Ga	Sc	3.410	0.763
Zn	Cd	Sn	Ti	Al	In	In	Sc	1.893	0.763	Mg	Ba	Si	Zr	Ga	Ga	In	Sc	2.404	0.891	Mg	Ca	Ba	Cd	Ge	Ti	Hf	Hf	2.788	0.689	Be	Mg	Zn	Cd	Ti	Zr	Hf	Hf	3.411	0.470	
Ca	Ba	Ge	Ti	In	In	Sc	Y	1.893	0.926	Ba	Cd	Ge	Ti	In	Sc	Sc	Y	2.404	0.810	Be	Cd	Ti	Zr	Al	In	In	Sc	2.789	0.598	Be	Mg	Ba	Ba	Si	Sn	Ti	Hf	3.412	0.611	
Ba	Ba	Zn	Cd	Si	Sn	Ti	Zr	1.893	0.960	Ca	Sr	Ti	Hf	Al	In	In	Sc	2.404	0.766	Be	Sr	Si	Zr	Zr	Ga	Sc	Y	2.789	0.671	Be	Mg	Sr	Ba	Si	Si	Sn	Zr	3.412	0.690	
Ba	Ba	Zn	Cd	Ge	Sn	Ti	Hf	1.893	0.735	Ca	Zn	Si	Ti	Al	Al	In	Sc	2.405	0.725	Be	Zn	Ge	Hf	Al	Al	Ga	In	2.789	0.567	Be	Zn	Ti	Zr	Al	Sc	Sc	Y	3.412	0.868	
Ca	Zn	Sn	Hf	Ga	Ga	Sc	Y	1.893	0.909	Mg	Sr	Zr	Hf	Al	In	In	Y	2.405	1.002	Zn	Cd	Si	Ti	Al	Ga	Ga	Y	2.789	0.753	Be	Zn	Cd	Cd	Si	Ti	Zr	Hf	3.413	0.916	
Sr	Ba	Cd	Cd	Si	Sn	Sn	Ti	1.894	0.956	Ca	Cd	Zr	Hf	In	In	Sc	Y	2.405	0.807	Be	Mg	Si	Hf	Al	In	Y	Y	2.789	0.773	Be	Mg	Zr	Ti	Hf	Al	Ga	Sc	Sc	3.414	0.658
Sr	Ba	Cd	Cd	Ge	Sn	Ti	Hf	1.894	0.730	Be	Mg	Ba	Cd	Si	Sn	Sn	Ti	2.405	0.772	Be	Sr	Zr	Zr	Al	Ga	In	Sc	2.789	0.667	Be	Mg	Zr	Hf	Al	Al	Sc	Y	3.414	0.793	
Ca	Sr	Ge	Zr	Ga	Ga	In	Y	1.894	0.714	Be	Ba	Si	Hf	Al	Al	In	Y	2.405	0.850	Ca	Zn	Ge	Zr	Ga	Sc	Sc	Y	2.789	0.634	Be	Be	Si	Ti	Al	Ga	In	Y	3.414	0.865	
Ca	Cd	Sn	Zr	Al	Al	In	Sc	1.894	0.749	Be	Cd	Ti	Hf	Ga	In	Y	Y	2.405	0.937	Be	Ca	Zr	Zr	Zr	In	Sc	Y	2.789	0.810	Be	Be	Mg	Sr	Sn	Ti	Zr	Hf	3.415	0.495	
Sr	Zn	Si	Hf	Ga	In	In	Sc	1.894	0.708	Be	Cd	Sn	Hf	Al	Ga	Ga	Y	2.405	0.859	Be	Ca	Sr	Cd	Sn	Ti	Zr	Zr	2.789	0.660	Mg	Ca	Ba	Zn	Ge	Ti	Ti	Hf	3.415	0.572	
Ca	Cd	Si	Hf	Al	In	In	Y	1.894	0.700	Ca	Cd	Si	Sn	Al	Sc	Sc	Y	2.406	1.057	Mg	Ca	Ti	Zr	Al	In	In	Sc	2.790	0.802	Be	Ti	Hf	Al	Ga	Sc	Y	Y	3.416	0.426	
Be	Ba	Ge	Ti	Ga	In	Y	Y	1.895	0.743	Be	Sr	Si	Hf	Al	Ga	Ga	In	2.406	0.992	Be	Sr	Zn	Cd	Si	Ge	Zr	Zr	2.790	0.929	Mg	Ca	Ba	Zn	Sn	Ti	Ti	Zr	3.417	0.546	
Mg	Sr	Ge	Hf	Ga	Ga	In	Y	1.895	0.696	Be	Sr	Ge	Ti	Al	In	Sc	Sc	2.406	0.901	Be	Cd	Zr	Hf	Al	Al	Ga	In	2.790	0.757	Mg	Ca	Ba	Zn	Si	Ti	Ti	Hf	3.417	0.536	
Ca	Ba	Ge	Sn	Ga	Sc	Y	Y	1.895	0.818	Be	Ba	Si	Ti	Ga	Ga	In	Sc	2.406	0.948	Ca	Ba	Zr	Hf	Ga	Sc	Sc	Y	Y	2.790	0.517	Mg	Cd	Ti	Zr	Al	Sc	Sc	Y	3.417	0.553
Be	Sr	Sn	Ti	Al	In	Y	Y	1.895	0.823	Ca	Zn	Sn	Zr	In	Sc	Y	Y	2.406	0.837	Be	Sr	Ba	Zn	Sn	Sn	Ti	Zr	2.790	0.487	Be	Sr	Ba	Ge	Sn	Ti	Hf	3.417	0.637		
Zn	Zn	Sn	Hf	Al	Ga	In	Y	1.896	0.660	Mg	Sr	Cd	Cd	Si	Sn	Ti	Zr	2.406	0.847	Ca	Zn	Zr	Zr	Al	Ga	In	Sc	2.791	0.602	Be	Mg	Zn	Cd	Si	Si	Ge	Zr	3.417	0.560	
Be	Ca	Sn	Zr	Ga	In	Y	Y	1.896	0.775	Sr	Ba	Ti	Hf	Al	Ga	Ga	In	2.406	0.857	Mg	Sr	Zr	Zr	Hf	Ga	Sc	Sc	Y	2.791	0.680	Be	Mg	Ca	Cd	Si	Si	Ti	Hf	3.417	0.666
Be	Mg	Ge	Sn	In	In	Sc	Y	1.896	0.802	Sr																														

Be	Cd	Sn	Ti	Al	Ga	In	In	1.911	0.248	Mg	Ba	Zr	Zr	Ga	In	Sc	Y	2.414	0.965	Be	Zn	Ti	Hf	In	In	Sc	Y	2.801	0.820	Be	Mg	Sr	Ba	Si	Si	Sn	Ti	3.447	1.148	
Ca	Ba	Sn	Ti	Ga	In	Y	Y	1.911	0.652	Sr	Sr	Zn	Cd	Si	Ti	Zr	Hf	2.415	1.168	Be	Sr	Zr	Hf	Al	Al	In	Sc	2.801	0.935	Be	Mg	Si	Ti	Al	In	Sc	Sc	3.448	0.906	
Cr	Zn	Si	Ge	In	Y	Sc	Sc	1.911	0.567	Mg	Sr	Ge	Hf	In	Sc	Sc	Y	2.415	1.085	Mg	Cd	Sn	Zr	Al	Ga	Sc	Sc	Y	2.801	1.075	Be	Mg	Si	Ti	Al	In	Sc	Sc	3.448	1.030
Cd	Cd	Ge	Ti	Al	Ga	In	Y	1.912	0.193	Mg	Sr	Zr	Hf	In	Sc	Y	Y	2.415	1.000	Zn	Cd	Ti	Zr	Ga	Ga	Sc	Y	2.801	0.906	Be	Ca	Sr	Ba	Ge	Sn	Sn	Ti	3.448	1.060	
Ca	Sr	Sn	Ti	Ti	Ga	In	Sc	1.912	0.565	Mg	Ca	Sn	Ti	Al	Ga	Ga	Sc	2.415	1.026	Mg	Mg	Ba	Cd	Ge	Sn	Zr	Hf	2.801	0.622	Be	Zn	Zn	Cd	Si	Ge	Sn	Ti	3.449	0.791	
Ca	Ba	Si	Sn	Al	Ga	Y	Y	1.912	0.549	Ca	Ba	Zn	Zn	Si	Ge	Sn	Zr	2.415	0.911	Mg	Ca	Zn	Cd	Ge	Ge	Ti	Zr	2.801	0.598	Be	Be	Mg	Zn	Si	Ti	Zr	Hf	3.450	0.846	
Sr	Ba	Zn	Cd	Ge	Ge	Sn	Zr	1.912	0.163	Sr	Zn	Ti	Zr	Al	Al	In	Y	2.415	0.961	Be	Be	Zn	Cd	Si	Sn	Zr	Hf	2.802	0.745	Mg	Mg	Ba	Zn	Ge	Ti	Zr	Hf	3.451	0.715	
Ba	Cd	Sn	Ti	Al	Al	Ga	Sc	1.912	0.548	Sr	Zn	Si	Ti	Ga	Sc	Y	Y	2.415	0.959	Ca	Sr	Ti	Hf	In	Sc	Y	Y	2.802	0.821	Mg	Sr	Sr	Ba	Ge	Sn	Zr	Hf	3.451	0.827	
Be	Sr	Ge	Sn	Al	Sc	Sc	Y	1.913	0.545	Mg	Mg	Si	Sn	Al	Ga	In	Sc	2.415	1.033	Mg	Ca	Cd	Si	Ge	Sn	Hf	2.802	0.993	Mg	Cd	Si	Ti	Al	Sc	Y	Y	3.451	0.775		
Be	Ba	Zn	Zr	Al	In	Sc	Sc	1.913	0.159	Be	Sr	Ge	Hf	Al	Ga	Sc	Sc	2.415	0.994	Mg	Ca	Hf	Hf	Al	Ga	In	Y	2.802	0.942	Be	Mg	Ti	Zr	Ga	In	Sc	Sc	3.452	0.854	
Ba	Ba	Ge	Zr	Al	In	Sc	Sc	1.913	0.425	Be	Sr	Si	Hf	Ga	In	Sc	Sc	2.416	1.145	Be	Ba	Si	Hf	Al	Sc	Sc	Y	2.802	0.959	Be	Mg	Sr	Zn	Ge	Ge	Ti	Zr	3.452	0.916	
Mg	Ba	Ge	Ti	Al	In	In	Sc	1.913	0.474	Ba	Ca	Ge	Hf	Ga	Ga	Sc	Y	2.416	1.071	Bd	Cd	Ge	Hf	Al	Ga	Sc	Sc	2.802	1.089	Be	Mg	Ge	Ti	Al	Al	Ga	Y	3.452	0.851	
Sr	Zn	Si	Ge	Al	Ga	Y	Y	1.913	0.181	Ca	Cd	Si	Zr	Ga	Ga	Sc	Y	2.416	1.012	Ca	Zn	Cd	Cd	Si	Ti	Zr	Hf	2.802	1.018	Be	Mg	Ca	Zn	Si	Ge	Ge	Zr	3.453	0.951	
Mg	Ba	Sn	Ti	Al	In	Y	Y	1.913	0.409	Be	Ba	Ti	Hf	Ga	Ga	In	Y	2.416	1.023	Mg	Ca	Zr	Hf	Al	Al	In	Sc	2.802	0.662	Ca	Ca	Sr	Ba	Si	Ge	Sn	Hf	3.454	0.863	
Ca	Cd	Ge	Ti	Ga	In	Y	Y	1.914	0.469	Ca	Zn	Si	Ti	Al	In	Y	Y	2.416	0.915	Mg	Cd	Zr	Zr	Ga	In	Sc	Y	2.803	0.639	Mg	Zn	Si	Ti	In	Sc	Sc	Y	3.454	0.871	
Sr	Ba	Ge	Sn	Ga	Sc	Y	Y	1.914	0.171	Be	Zn	Si	Sn	Al	Al	In	Y	2.416	0.959	Mg	Cd	Si	Zr	Al	In	Sc	Y	2.803	0.858	Mg	Ca	Ba	Zn	Si	Si	Ti	Zr	3.454	0.934	
Sr	Ba	Ge	Hf	Al	Al	In	Y	1.914	0.550	Be	Sr	Zn	Zr	Al	Sc	Sc	Y	2.416	1.070	Be	Zn	Si	Hf	Al	Ga	Y	Y	2.803	0.702	Mg	Cd	Si	Zr	Al	Sc	Sc	Y	3.455	0.878	
Ba	Cd	Si	Zr	Al	In	Y	Y	1.914	0.559	Ca	Cd	Si	Hf	Al	Al	In	Sc	2.417	0.982	Be	Mg	Si	Sn	Al	Al	Ga	In	2.803	0.696	Be	Be	Sr	Ba	Ge	Ti	Zr	Hf	3.455	0.977	
Be	Sr	Sn	Hf	Al	Ga	Y	Y	1.914	0.134	Be	Cd	Zr	Hf	Al	Ga	In	In	2.417	1.128	Mg	Sr	Zr	Hf	Al	Ga	Ga	Y	2.803	1.019	Be	Mg	Si	Hf	Al	Al	Ga	In	3.455	0.884	
Ba	Zn	Si	Hf	Ga	Ga	In	Sc	1.914	0.779	Ca	Cd	Zr	Hf	Al	In	Y	Y	2.417	1.219	Mg	Zn	Ge	Hf	Al	Ga	Ga	Sc	2.803	1.031	Ca	Sr	Ba	Ba	Ge	Ti	Zr	Hf	3.456	1.003	
Ba	Zn	Si	Ge	Al	Al	Ga	In	1.914	0.691	Ca	Cd	Ti	Zr	Al	In	Y	Y	2.417	1.062	Be	Be	Si	Sn	Al	In	Sc	Y	2.803	0.929	Mg	Zn	Ti	Zr	Al	Ga	Ga	Sc	3.456	1.044	
Mg	Ba	Ge	Ti	Ga	Ga	In	Y	1.915	0.444	Mg	Ba	Zn	Cd	Ge	Ge	Zr	Hf	2.417	1.005	Sr	Ba	Ge	Zr	Al	Sc	Y	Y	2.803	0.845	Be	Ca	Zn	Zn	Si	Ge	Ti	Zr	3.456	0.914	
Ca	Ba	Cd	Cd	Si	Ge	Sn	Hf	1.915	0.682	Ca	Ba	Ba	Cd	Si	Ge	Zr	Hf	2.417	0.968	Mg	Sr	Si	Hf	Al	Ga	Sc	Sc	2.803	0.812	Be	Mg	Sr	Zn	Si	Ti	Ti	Zr	3.456	1.016	
Ca	Zn	Ge	Zr	Al	In	In	Sc	1.915	0.675	Ca	Sr	Ge	Hf	In	Sc	Sc	Y	2.417	0.896	Be	Mg	Si	Sn	Al	In	Sc	Sc	2.804	0.858	Be	Mg	Ca	Zn	Si	Si	Sn	Ti	3.457	0.958	
Sr	Ba	Sn	Hf	Al	Ga	Y	Y	1.915	0.414	Ca	Ba	Ti	Zr	Ga	In	In	Sc	2.417	0.850	Mg	Ba	Ti	Zr	Ga	Sc	Sc	Y	2.804	0.771	Mg	Mg	Ca	Sr	Si	Ge	Sn	Zr	3.458	1.031	
Sr	Zn	Si	Ti	Al	In	In	Y	1.915	0.663	Sr	Sr	Zr	Hf	Al	In	Sc	Y	2.417	1.154	Mg	Ba	Ti	Zr	Ga	Sc	Y	Y	2.804	0.932	Mg	Ca	Sr	Zn	Si	Ge	Ge	Ti	3.458	1.080	
Sr	Zn	Ge	Ti	Al	Ga	Ga	In	1.915	0.672	Ca	Ba	Zn	Cd	Si	Si	Ge	Hf	2.417	0.929	Zn	Cd	Zr	Hf	In	In	Sc	Sc	Y	2.804	0.951	Be	Zn	Si	Hf	Al	Sc	Sc	Y	3.458	1.014
Be	Sr	Ge	Zr	Ga	In	In	Sc	1.915	0.410	Sr	Zn	Zr	Hf	Al	Ga	Y	Y	2.417	0.890	Mg	Cd	Sn	Ti	In	Sc	Sc	Y	2.804	0.863	Be	Ca	Zn	Sn	Si	Ti	Zr	Hf	3.459	1.104	
Mg	Ca	Sn	Hf	Al	In	In	Sc	1.916	0.526	Mg	Sr	Zr	Zr	Al	Al	Ga	Sc	2.417	0.989	Be	Ca	Ba	Zn	Si	Sn	Hf	Hf	2.804	0.819	Be	Mg	Zn	Cd	Si	Ti	Ti	Zr	3.459	1.011	
Sr	Ba	Ge	Zr	Al	Ga	Ga	Sc	1.916	0.587	Ba	Cd	Ti	Zr	Al	Al	Ga	Sc	2.418	1.051	Be	Mg	Sn	Ti	Ti	In	In	Sc	2.804	0.958	Be	Be	Si	Ti	Al	In	Sc	Y	3.461	1.044	
Zn	Cd	Sn	Zr	Al	Al	In	Y	1.916	0.446	Mg	Ca	Zn	Cd	Si	Sn	Hf	Hf	2.418	0.987	Be	Zn	Zr	Hf	Ga	Sc	Y	Y	2.804	0.851	Be	Mg	Zr	Hf	Al	Ga	Ga	In	3.461	1.094	
Mg	Ba	Sn	Ti	Al	Al	In	Y	1.916	0.508	Be	Cd	Ti	Hf	Al	Ga	In	In	2.418	1.191	Ca	Sr	Mg	Si	Ge	Al	Ga	In	Sc	2.804	0.953	Be	Mg	Ca	Zn	Si	Zr	Zr	Hf	3.462	1.037
Ca	Ba	Zn	Cd	Si	Ge	Ge	Sn	1.916	0.582	Ba	Ba	Ti	Hf	Ga	In	Sc	Sc	2.418	1.099	Mg	Ca	Cd	Cd	Ge	Sn	Ti	Zr	2.804	1.068	Be	Mg	Sr	Zn	Ge	Ti	Ti	Zr	3.462	1.124	
Ca	Cd	Si	Ge	Al	Ga	Ga	Y	1.916	0.435	Sr	Ba	Si	Zr	Ga	In	Sc	Sc	2.418	1.022	Ca	Cd	Ti	Ti	Al	Ga	Sc	Y	2.804	0.939	Mg	Zn	Ti	Zr	Al	Ga	Sc	Sc	3.462	1.026	
Be	Ba	Sn	Hf	Al	Al	In	Sc	1.917	0.645	Be	Zn	Sn	Zr	Ga	In	In	Sc	2.418	1.057	Mg	Cd	Ge	Ge	Hf	Ga	Sc	Y	Y	2.804	0.683	Mg	Sr	Ba	Ba	Sn	Ti	Zr	Hf	3.462	0.787
Ca	Ba	Si	Ge	Al	Al	Ga	Y	1.917	0.656	Sr	Ba	Ti	Zr	Ga	Ga	In	Y	2.418	0.943	Be	Sr	Si	Ti	Al	Ga	Ga	Sc	2.805	0.673	Be	Mg	Si	Ge	Al	Al	Sc	Y	3.463	0.795	
Mg	Sr	Sn	Hf	Ga	In	Ga	Sc	1.917	0.395	Be	Cd	Sn	Hf	Al	In	In	Sc	2.418	0.994	Be	Ca	Sr	Zn	Si	Sn	Sn	Hf	2.805	0.823	Be	Mg	Ca	Zn	Sn	Ti	Hf	Hf	3.464	0.747	
Ba	Ba	Ge	Zr	Ga	In	Ga	Sc	1.917	0.622	Ba	Zn	Zr	Zr	Al	In	Sc	Y	2.418	0.979	Ca	Cd	Zr	Hf	In	Sc	Y	Y	2.805	0.822	Ca	Ca	Sr	Ba	Si	Ge	Zr	Hf	3.464	0.855	
Ba	Zn	Ge	Hf	Al	Al	Ga	Sc	1.917	0.685	Sr	Ba	Zr	Hf	Al	In	Y	Y	2.418	1.042	Ca	Ba	Ti	Hf	Hf	Ga	Sc	Y	2.805	0.953	Be	Mg	Zr	Hf	Al	Al	In	Sc	3.464	0.775	
Mg	Cd	Sn	Ti	Al	In	In	Y	1.918	0.875	Be	Ba	Zr	Hf	In	Sc	Sc	Y	2.419	1.006	Mg	Zn	Sn	Ti	In	Sc	Y	Y	2.805	0.916	Be	Mg	Mg	Ba	Si	Ge	Sn	Hf	3.464	0.798	
Mg	Sr	Zn	Cd	Si	Ge	Ge	Sn	1.918	0.604	Mg	Ca	Ba	Cd	Si	Sn	Sn	Hf	2.419	1.164	Zn	Cd	Zr	Hf	Al	In	Sc	Sc	2.805	0.943	Mg	Ca	Sr	Zn	Ti	Ti	Zr	Hf	3.465	0.807	
Bd	Cd	Ge	Zr	Al	Ga	Ga	In	1.918	0.680	Sr	Zn	Ti	Hf	Al	Ga	Ga	In	2.419	1.081	Ca	Sr	Ba	Zn	Si	Sn	Sn	Zr	2.805	1.052	Be	Mg	Sn	Ti	Al	Al	Ga	Sc	3.465	0.768	
Mg	Zn	Si	Ge	Ga	In	In	Y	1.918	0.866	Ca	Sr	Ba	Cd	Si	Si	Ge	Sn	2.419	1.025	Ca	Zn	Si	Ti	Al	Al	In	Sc	2.805	0.995	Ca	Ca	Sr	Ba	Si	Ge	Sn	Zr	3.465	0.873	
Ca	Cd	Ge	Hf	Al	Ga	Y	Y	1.918	0.719	Be	Ca	Sr	Cd	Si	Sn	Sn	Zr	2.420	1.050	Mg	Cd	Si	Si	Ge	Al	Ga	Sc	Sc	2.805	0.688	Be	Ca	Zn	Zn	Ge	Ti	Zr	Hf	3.466	0.788
Ca	Cd	Sn	Hf	Al	In	Sc	Sc	1.919	0.731	Be	Cd	Si	Ge	In	Sc	Y	Y	2.420	0.943	Ca	Zn	Si	Ti	Al	Ga	Ga	Sc	2.805	0.680	Mg	Mg	Ba	Zn	Si	Ge	Ti	Zr	3.467	0.832	
Ca	Ba</																																							

Ca	Ba	Cd	Cd	Si	Ge	Sn	Zr	1.932	0.881	Mg	Ba	Si	Ti	Al	Ga	Ga	Y	2.429	0.873	Ca	Sr	Si	Ti	Al	Ga	Y	Y	2.814	0.634	Mg	Ca	Sr	Ba	Si	Sn	Sn	Hf	3.502	0.507	
Sr	Cd	Ge	Zr	Al	In	Sc	Sc	1.933	0.976	Be	Ca	Zr	Hf	Ga	In	Y	Y	2.429	0.943	Be	Ca	Zn	Cd	Si	Si	Ge	Sn	2.814	0.755	Be	Be	Mg	Sr	Si	Sn	Ti	Zr	3.503	0.622	
Mg	Zn	Ge	Sn	Al	Ga	Y	Y	1.933	0.731	Be	Ba	Zn	Ti	Al	Ga	In	Y	2.430	0.907	Be	Mg	Zr	Hf	Al	In	Y	Y	2.814	0.706	Mg	Ca	Sr	Zn	Sn	Ti	Zr	3.503	0.869		
Sr	Zn	Si	Sn	Al	Ga	Sc	Sc	1.933	0.778	Be	Zn	Si	Sn	Ga	Ga	Sc	Y	2.430	1.039	Ca	Sr	Zr	Hf	Al	Al	Ga	Sc	2.814	0.749	Be	Cd	Si	Ti	Al	Al	Ga	Sc	0.882		
Ca	Ba	Sn	Zr	Al	Al	In	Sc	1.933	0.809	Be	Ba	Si	Hf	Al	In	Sc	Y	2.430	0.935	Be	Sr	Ti	Hf	Al	Al	Ga	Y	2.814	0.815	Mg	Ca	Sr	Ba	Si	Sn	Sn	Zr	3.504	0.604	
Ca	Ba	Ge	Ti	Ga	Ga	In	Y	1.933	0.718	Be	Ca	Ti	Hf	Ga	In	Y	Y	2.430	0.880	Mg	Ca	Zr	Zr	Al	In	Sc	Y	2.814	0.746	Be	Mg	Ca	Zn	Ge	Ge	Zr	Hf	3.504	0.723	
Mg	Ba	Si	Sn	Al	Ga	Sc	Sc	1.933	0.754	Ca	Ba	Si	Hf	Al	Al	Ga	In	2.430	1.060	Ca	Sr	Ba	Cd	Si	Si	Ge	Hf	2.815	0.624	Mg	Ca	Sr	Zn	Ge	Ti	Ti	Hf	3.505	0.833	
Sr	Cd	Si	Ti	Ga	Ga	In	Y	1.934	0.795	Mg	Zn	Si	Hf	Ga	In	In	Y	2.430	0.924	Mg	Mg	Zn	Cd	Ge	Ti	Ti	Hf	2.815	0.584	Mg	Zn	Ge	Ti	Al	Sc	Sc	Y	3.505	0.558	
Mg	Sr	Sn	Hf	Al	Ga	Ga	Sc	1.934	0.699	Ca	Ba	Si	Hf	Al	Ga	In	In	2.430	0.826	Be	Cd	Sn	Ti	Al	Al	Sc	Y	2.815	0.633	Mg	Mg	Ca	Zn	Si	Sn	Ti	Zr	3.505	0.594	
Ba	Cd	Si	Sn	Ga	Sc	Y	Y	1.934	0.805	Sr	Ba	Zn	Cd	Sn	Ti	Ti	Hf	2.430	1.057	Ca	Sr	Ba	Cd	Sn	Ti	Ti	Zr	2.815	0.625	Be	Mg	Ca	Zn	Sn	Ti	Zr	Zr	3.505	0.413	
Ca	Sr	Sn	Hf	Al	Al	Ga	Sc	1.934	0.812	Be	Ca	Ba	Cd	Si	Sn	Zr	Zr	2.430	0.938	Ba	Cd	Ti	Zr	Ga	Sc	Sc	Y	2.815	0.601	Mg	Ca	Zn	Sn	Ti	Zr	Hf	3.506	0.506		
Sr	Ba	Zn	Cd	Ge	Sn	Sn	Ti	1.934	0.674	Ca	Sr	Si	Zr	Ga	Ga	In	Sc	2.430	0.941	Be	Zn	Zn	Cd	Si	Ge	Sn	Hf	2.815	0.752	Be	Mg	Ca	Zn	Si	Ti	Ti	3.506	0.544		
Mg	Ca	Ge	Hf	Al	In	In	Y	1.934	1.163	Be	Zn	Si	Sn	Ga	Ga	Y	Y	2.430	1.044	Be	Ca	Si	Zr	Al	Ga	Ga	In	2.815	0.868	Mg	Zn	Ti	Hf	Al	Sc	Sc	Y	3.507	0.644	
Be	Zn	Ge	Sn	Al	In	In	Sc	1.935	1.140	Mg	Cd	Ge	Zr	Al	Al	Ga	In	2.431	1.020	Be	Ca	Ba	Zn	Ge	Sn	Zr	In	2.815	0.730	Ca	Sr	Ba	Si	Ti	Zr	Hf	3.508	0.685		
Ba	Zn	Si	Hf	Al	Ga	Ga	Y	1.935	1.003	Be	Ca	Sr	Cd	Ge	Sn	Sn	Zr	2.431	0.884	Ca	Cd	Si	Hf	In	Sc	Sc	Y	2.815	0.706	Be	Be	Ca	Ba	Ge	Ti	Zr	Hf	3.508	0.572	
Sr	Cd	Si	Ge	Al	In	In	Sc	1.935	1.028	Be	Ca	Si	Hf	Al	Al	Ga	In	2.431	0.397	Be	Ca	Si	Hf	Al	Ga	Ga	Y	2.815	0.637	Be	Zn	Zr	Hf	Al	Ga	Ga	Sc	3.509	0.644	
Sr	Zn	Si	Zr	Ga	In	Y	Y	1.936	1.115	Mg	Cd	Si	Hf	Ga	Ga	In	Y	2.431	0.797	Be	Ca	Ba	Cd	Sn	Ti	Ti	Zr	2.815	0.644	Mg	Ca	Ba	Ba	Ge	Ti	Zr	Hf	3.510	0.649	
Cd	Cd	Sn	Ti	Ga	In	Sc	Y	1.936	0.967	Be	Ba	Sn	Ti	Al	Sc	Sc	Y	2.431	0.666	Zn	Cd	Ge	Ti	Al	Al	Ga	Sc	2.815	0.626	Mg	Ca	Sr	Zn	Si	Si	Ge	Zr	3.511	0.665	
Mg	Sr	Si	Ge	Al	In	Sc	Sc	1.936	0.997	Mg	Ca	Ba	Cd	Si	Sn	Sn	Zr	2.431	0.403	Sr	Zn	Ti	Hf	In	Sc	Sc	Y	2.816	0.732	Be	Ca	Sr	Zn	Si	Si	Ge	Ti	3.512	0.707	
Sr	Cd	Sn	Zr	Al	Al	Sc	Y	1.936	1.107	Sr	Ba	Ba	Cd	Si	Sn	Ti	Zr	2.431	0.843	Zn	Cd	Zr	Zr	Al	Ga	Sc	Y	2.816	0.672	Mg	Ca	Sr	Zn	Si	Ti	Ti	Hf	3.512	0.602	
Sr	Zn	Sn	Zr	Al	Ga	Sc	Sc	1.937	0.957	Sr	Zn	Ge	Zr	In	Sc	Sc	Y	2.431	0.714	Mg	Mg	Si	Hf	Al	Ga	In	Y	2.817	0.655	Be	Be	Zr	Hf	Al	Ga	In	Sc	3.512	0.671	
Ba	Zn	Si	Ti	Ga	In	Y	Y	1.937	0.878	Be	Sr	Ge	Hf	Al	Al	Ga	Sc	2.431	0.542	Mg	Ca	Ba	Cd	Ge	Ti	Zr	Zr	2.817	0.659	Be	Sr	Ba	Ba	Ge	Sn	Zr	Hf	3.512	0.672	
Ba	Ba	Ge	Zr	Al	In	Sc	Y	1.937	0.920	Mg	Cd	Si	Sn	Al	Ga	Sc	Sc	2.432	0.946	Be	Ba	Ti	Zr	Al	Sc	Sc	Y	2.817	0.794	Be	Mg	Ti	Hf	Al	Sc	Sc	Y	3.512	1.004	
Sr	Cd	Si	Hf	Ga	Ga	In	Sc	1.937	0.933	Ba	Cd	Ti	Zr	Al	Al	Ga	Y	2.432	0.666	Mg	Sr	Ti	Zr	Al	Al	Ga	Y	2.817	0.744	Mg	Sr	Sr	Ba	Si	Sn	Zr	Hf	3.513	1.023	
Mg	Cd	Ge	Hf	Ga	In	In	Y	1.937	0.852	Be	Cd	Ge	Hf	Ga	Ga	In	Sc	2.432	0.562	Ca	Zn	Si	Ge	Al	Sc	Y	Y	2.817	0.766	Be	Mg	Ca	Zn	Ge	Sn	Ti	Ti	3.514	0.756	
Be	Sr	Sn	Hf	Al	Al	Ga	In	1.937	0.906	Sr	Ba	Zr	Hf	Al	Ga	In	In	2.432	1.009	Be	Zn	Sn	Ti	Ga	In	Sc	Sc	2.817	0.836	Be	Mg	Zn	Zn	Sn	Ti	Zr	Hf	3.514	0.864	
Mg	Sr	Sn	Hf	Al	Al	Ga	Y	1.937	0.914	Mg	Sr	Ge	Ti	Al	In	Sc	Sc	2.432	0.713	Ca	Sr	Sr	Zn	Si	Sn	Zr	Hf	2.817	0.769	Mg	Zn	Si	Ti	Al	Ga	Sc	Sc	3.514	0.969	
Zn	Cd	Ge	Hf	Ga	In	Y	Y	1.938	0.897	Ca	Zn	Sn	Hf	Ga	Sc	Y	Y	2.432	0.307	Ca	Ba	Si	Ti	In	Sc	Sc	Y	2.817	0.669	Mg	Ca	Ca	Zn	Si	Ge	Ti	Hf	3.514	0.668	
Be	Cd	Sn	Hf	Al	In	In	Y	1.938	0.906	Mg	Cd	Si	Zr	Ga	In	Y	Y	2.432	0.386	Be	Zn	Ge	Zr	Ga	Ga	Sc	Y	2.817	0.620	Mg	Mg	Sr	Zn	Sn	Ti	Zr	Hf	3.515	0.710	
Sr	Ba	Si	Hf	Ga	In	In	Y	1.938	0.872	Mg	Cd	Si	Zr	Ga	Ga	In	Sc	2.432	0.323	Ca	Zn	Si	Ti	In	Al	In	Sc	Sc	2.818	0.657	Be	Ca	Sr	Ba	Ge	Sn	Sn	Zr	3.515	0.539
Zn	Cd	Si	Sn	Hf	Ga	Ga	Sc	1.938	0.975	Be	Cd	Sn	Hf	Ga	Sc	Y	Y	2.432	0.661	Zn	Cd	Si	Ti	Ga	In	Sc	Sc	2.818	0.641	Be	Mg	Ca	Zn	Si	Ge	Zr	Zr	3.515	0.621	
Be	Sr	Sn	Zr	Ga	In	Sc	Sc	1.938	1.013	Ca	Ba	Ti	Hf	Al	Ga	Ga	Y	2.432	1.043	Be	Mg	Sn	Zr	Ga	In	Sc	Sc	2.818	0.765	Be	Be	Mg	Sr	Si	Ti	Zr	Hf	3.516	0.653	
Mg	Sr	Sn	Hf	Al	Ga	Ga	Sc	1.938	1.209	Be	Cd	Sn	Zr	Ga	In	Sc	Sc	2.432	0.876	Sr	Ba	Ge	Ti	Zr	Ga	Sc	Y	Y	2.818	0.717	Be	Be	Ca	Ba	Ge	Sn	Zr	Hf	3.516	0.741
Be	Ca	Sn	Hf	Al	In	Y	Y	1.938	0.948	Mg	Ca	Sr	Cd	Si	Ge	Ge	Sn	2.433	0.679	Ca	Ca	Sr	Cd	Si	Ti	Zr	Hf	2.818	0.739	Mg	Zn	Si	Hf	Al	Sc	Sc	Y	3.517	0.789	
Mg	Cd	Ge	Ge	Al	Ga	In	Sc	1.938	1.000	Mg	Cd	Ge	Zr	Hf	Al	Ga	In	In	2.433	1.104	Ca	Cd	Zr	Hf	Al	Ga	Ga	Sc	2.818	0.798	Be	Be	Ca	Sr	Si	Sn	Ti	Hf	3.517	0.683
Zn	Cd	Sn	Cd	Ge	Sn	Zr	Zr	1.939	1.191	Sr	Ba	Sn	Ti	In	Sc	Y	Y	2.433	0.918	Zn	Cd	Ti	Zr	Al	Ga	Ga	Y	2.818	0.731	Mg	Ca	Sr	Zn	Ge	Ti	Ti	Zr	3.517	0.745	
Ca	Ba	Zn	Cd	Ge	Sn	Zr	Zr	1.939	0.977	Be	Sr	Si	Hf	Ga	Ga	In	Sc	2.433	0.459	Mg	Ba	Zn	Zn	Si	Sn	Ti	Hf	2.818	0.658	Be	Zn	Zr	Hf	Al	Al	Ga	Sc	3.519	0.744	
Zn	Cd	Ge	Sn	Al	Al	Ga	Sc	1.939	0.985	Mg	Cd	Si	Hf	Ga	In	In	Sc	2.433	0.539	Be	Be	Sn	Zr	Al	In	Sc	Y	2.818	0.609	Mg	Ca	Sr	Ba	Sn	Zr	Hf	Hf	3.520	0.760	
Sr	Zn	Ge	Hf	Al	Al	Ga	In	1.939	1.144	Sr	Cd	Ti	Hf	Ga	In	Sc	Sc	2.433	0.552	Be	Mg	Cd	Cd	Si	Sn	Zr	Hf	2.818	0.614	Ca	Ca	Sr	Ba	Si	Ti	Zr	Hf	3.520	0.808	
Mg	Sr	Ge	Zr	Al	In	In	Sc	1.939	0.772	Sr	Cd	Si	Zr	Al	Al	Ga	Sc	2.433	0.510	Mg	Zn	Zr	Hf	In	In	Sc	Y	2.818	0.638	Mg	Ca	Ca	Zn	Ge	Ti	Zr	Hf	3.520	0.711	
Ca	Ba	Ge	Ti	Al	Ga	Ga	Y	1.939	0.774	Mg	Cd	Ge	Hf	Ga	Ga	Sc	Y	2.433	0.606	Ca	Sr	Ba	Cd	Cd	Si	Ti	Ti	Zr	2.819	0.603	Ca	Ca	Sr	Ba	Si	Ti	Ti	Hf	3.521	0.770
Ca	Sr	Cd	Cd	Si	Ge	Sn	Hf	1.940	0.749	Mg	Sr	Si	Hf	Ga	Ga	In	Sc	2.433	0.844	Sr	Cd	Ti	Zr	Ga	Sc	Y	Y	2.819	0.710	Mg	Ca	Sr	Zn	Ti	Zr	Hf	Hf	3.521	0.765	
Ba	Cd	Ge	Ti	Al	Al	In	Sc	1.940	0.564	Ca	Zn	Ti	Hf	Al	In	Y	Y	2.433	1.184	Mg	Ca	Ca	Cd	Cd	Si	Ge	Sn	Zr	2.819	1.162	Mg	Ca	Ba	Zn	Si	Si	Ge	Ti	3.522	0.802
Ca	Sr	Zn	Cd	Si	Sn	Sn	Zr	1.940	0.561	Sr	Zn	Ge	Ti	Al	Al	Sc	Y	2.433	1.161	Zn	Cd	Ti	Zr	Ga	In	Sc	Sc	2.819	1.034	Be	Mg	Mg	Sn	Ge	Sn	Ti	Zr	3.523	0.835	
Zn	Cd	Ge	Hf	Ga	Ga	In	Y	1.940	0.420	Ca	Cd	Ti	Ti	Al	Ga	In	Y	2.433	1.047	Be	Ca	Sr	Zn	Ge	Sn	Sn	Hf	2.819	0.909	Be	Ca	Sr	Ba	Ge	Sn	Sn	Hf	3.523	0.673	
Sr	Cd	Si																																						

Ca	Cd	Sn	Zr	Ga	In	Sc	Sc	1.954	0.616	Be	Zn	Ge	Ti	Ga	In	Y	Y	2.443	0.604	Be	Ca	Ba	Zn	Si	Sn	Zr	Zr	2.827	0.446	Be	Mg	Si	Zr	Al	Al	Sc	Y	3.562	1.054	
Ca	Zn	Si	Hf	Ga	In	In	Y	1.955	0.358	Sr	Ba	Ge	Ti	Al	Ga	Sc	Sc	2.443	0.537	Ca	Sr	Si	Hf	In	Sc	Y	Y	2.827	0.544	Be	Mg	Ti	Ti	Al	Ga	Sc	Y	3.562	1.064	
Mg	Ca	Ge	Zr	Ga	In	In	Y	1.955	0.687	Be	Ca	Sn	Ti	In	Sc	Y	Y	2.443	0.590	Mg	Cd	Ti	Ti	In	Sc	Y	Y	2.828	0.523	Be	Mg	Sr	Ba	Sn	Sn	Ti	Hf	3.565	0.902	
Ca	Sr	Zn	Cd	Ge	Sn	Hf	Hf	1.955	0.696	Be	Cd	Si	Sn	Ga	Sc	Sc	Y	2.443	0.651	Mg	Sr	Ba	Cd	Ge	Ti	Ti	Hf	2.828	0.521	Mg	Sr	Ba	Ba	Ge	Sn	Ti	Zr	3.566	0.955	
Mg	Ba	Sn	Ti	Al	Al	Ga	In	1.955	0.304	Mg	Ba	Zn	Cd	Ge	Ge	Sn	Ti	2.443	0.769	Zn	Cd	Si	Ti	Ga	Ga	Sc	Y	2.828	0.750	Mg	Zn	Ti	Zr	Al	Al	Ga	Sc	3.566	0.914	
Be	Ca	Sn	Hf	Al	Ga	In	In	1.955	0.982	Mg	Ba	Ba	Cd	Ge	Sn	Ti	Zr	2.443	0.669	Be	Ca	Ti	Hf	In	Ga	Sc	Sc	Y	2.828	0.823	Be	Mg	Sr	Ba	Sn	Sn	Ti	Zr	3.566	0.808
Ca	Sr	Si	Ge	Al	Al	In	Y	1.955	0.973	Sr	Cn	Zn	Zn	Si	Ge	Sn	Ti	2.443	0.642	Ca	Zn	Ge	Ti	Ga	Ga	Sc	Y	Y	2.828	0.727	Be	Mg	Ti	Zr	Al	Al	In	Sc	3.567	0.785
Ba	Cd	Ti	Hf	Al	Ga	In	In	1.956	0.742	Zn	Cd	Si	Hf	Ga	Ga	In	Sc	2.444	0.592	Be	Cd	Ge	Ti	Al	Al	In	Sc	2.829	0.673	Mg	Ca	Ba	Ba	Si	Ge	Sn	Ti	3.567	0.607	
Ba	Cd	Si	Hf	Al	Ga	In	Y	1.956	0.834	Mg	Ba	Si	Hf	Ga	In	Sc	Sc	2.444	0.594	Be	Sr	Ti	Zr	Al	Al	In	Sc	2.829	0.572	Be	Mg	Sr	Ba	Sn	Zr	Hf	Hf	3.568	0.675	
Ca	Sr	Si	Ge	Ga	In	Sc	Y	1.956	0.929	Ca	Zn	Si	Ge	In	Sc	Y	Y	2.444	0.611	Be	Ca	Sr	Zr	Ge	Sn	Zr	2.829	0.641	Be	Mg	Sr	Ba	Si	Ge	Ge	Hf	3.569	0.637		
Ca	Cd	Ge	Zr	Al	Al	In	Y	1.956	0.683	Zn	Cd	Ti	Hf	Ga	In	In	Sc	2.444	0.566	Mg	Sr	Si	Ti	Al	Ga	Y	Y	2.829	0.586	Be	Mg	Sr	Ba	Sn	Zr	Zr	Hf	3.570	0.823	
Mg	Sr	Ge	Hf	Ga	In	Y	Y	1.956	0.806	Mg	Ba	Si	Ti	Ga	Ga	In	Sc	2.444	0.580	Be	Mg	Si	Zr	Ga	In	In	Y	2.829	0.676	Mg	Ca	Ba	Ba	Zr	Ge	Sn	Hf	3.571	0.801	
Ca	Ca	Ge	Zr	Al	Ga	In	Y	1.956	0.920	Be	Cd	Ge	Ge	Al	Ga	Sc	Y	2.444	0.701	Mg	Ba	Si	Zr	Ga	Sc	Sc	Y	2.829	0.719	Be	Mg	Si	Zr	Al	Al	Ga	Y	3.571	0.632	
Ca	Ba	Sn	Hf	Al	Ga	Y	Y	1.957	0.672	Sr	Cd	Ti	Zr	Al	Al	Ga	In	2.444	0.657	Mg	Ca	Si	Ti	Al	Ga	Ga	In	2.829	0.661	Mg	Ca	Ba	Ba	Si	Ge	Sn	Zr	3.571	0.697	
Be	Mg	Ge	Sn	Ga	Ga	In	Y	1.957	0.667	Zn	Cd	Ti	Hf	Ga	Ga	In	Y	2.444	0.600	Ca	Sr	Ba	Cd	Ge	Ti	Ti	Zr	2.829	0.606	Mg	Zn	Ti	Zr	Al	Al	Sc	Sc	Y	3.572	0.655
Sr	Cd	Si	Sn	Al	Al	Sc	Y	1.957	0.730	Sr	Ba	Zn	Cd	Cn	Sn	Ti	Ti	2.444	0.722	Be	Cd	Sn	Zr	Al	Sc	Sc	Y	2.830	0.761	Be	Ca	Ba	Ba	Ge	Sn	Zr	Hf	3.573	0.799	
Zn	Cd	Ge	Hf	Al	In	In	Sc	1.957	0.630	Ba	Cd	Ti	Zr	Al	In	Sc	Sc	2.445	0.568	Mg	Ba	Ge	Ti	Ti	Al	Sc	Sc	Y	2.830	0.660	Mg	Ca	Ca	Ba	Ge	Sr	Zr	Hf	3.573	0.757
Mg	Ba	Ge	Zr	Ga	In	Y	Y	1.957	0.641	Be	Ca	Sn	Zr	Ga	Sc	Y	Y	2.445	0.688	Be	Ba	Ba	Zn	Si	Ge	Sn	Hf	2.830	0.723	Be	Mg	Mg	Zn	Si	Ge	Sn	Ti	3.573	0.591	
Ba	Zn	Si	Hf	Al	Ga	Y	Y	1.958	0.718	Mg	Ca	Ge	Zr	Ga	Ga	Sc	Y	2.445	0.830	Mg	Ca	Ti	Ti	Al	Ga	In	Y	2.830	0.855	Be	Ca	Sr	Ba	Sn	Sn	Ti	Hf	3.573	0.652	
Sr	Zn	Sn	Ti	Ga	In	Sc	Sc	1.958	0.612	Mg	Ca	Ge	Hf	Al	Al	Ga	Y	2.445	0.656	Be	Ca	Zr	Hf	Ga	In	In	Sc	2.830	0.732	Be	Mg	Mg	Ba	Si	Ge	Sn	Ti	3.574	0.603	
Mg	Ba	Sn	Ti	Ga	In	Sc	Sc	1.958	0.779	Mg	Zn	Sn	Hf	Al	Al	In	Sc	2.445	0.567	Mg	Ba	Zn	Zn	Si	Sn	Ti	Zr	2.830	0.539	Mg	Sr	Ba	Ba	Ge	Sn	Ti	Hf	3.575	0.260	
Zn	Cd	Ge	Hf	Al	Ga	Ga	In	1.958	0.790	Mg	Sr	Sn	Hf	Al	Ga	Sc	Y	2.445	0.609	Mg	Cd	Ge	Hf	In	Sc	Sc	Y	2.830	0.532	Be	Ca	Zn	Zn	Si	Ti	Zr	Hf	3.576	0.339	
Ca	Sr	Sn	Ti	Al	Al	Ga	Y	1.958	0.556	Be	Ba	Cd	Zr	Al	In	Sc	Y	2.445	0.555	Mg	Cd	Ge	Ti	Al	Al	Ga	Y	2.830	0.599	Mg	Mg	Zr	Ba	Ge	Sn	Zr	Hf	3.576	0.099	
Sr	Cd	Ge	Ti	Ga	Ga	Sc	Y	1.958	0.716	Zn	Cd	Zr	Hf	Al	Ga	In	Y	2.445	0.595	Be	Ca	Ba	Cd	Ge	Ti	Ti	Zr	2.830	0.602	Be	Mg	Sr	Ti	Hf	Al	Al	Ga	Sc	3.576	0.238
Mg	Ca	Si	Ge	Al	In	In	Sc	1.959	0.772	Zn	Zn	Ge	Al	In	In	Sc	Y	2.445	0.703	Be	Ca	Ti	Zr	Al	In	In	Sc	2.831	0.746	Be	Mg	Ca	Zn	Ti	Zr	Zr	Hf	3.576	0.365	
Ca	Sr	Cd	Cd	Si	Ge	Sn	Zr	1.959	0.972	Ca	Ba	Sn	Ti	In	Sc	Y	Y	2.445	0.575	Be	Cd	Ti	Zr	Al	Al	Ga	In	2.831	0.684	Mg	Mg	Ca	Sr	Si	Ge	Sn	Ti	3.576	0.593	
Sr	Zn	Si	Zr	Ga	In	In	Sc	1.959	0.692	Mg	Ca	Si	Hf	Ga	In	In	Sc	2.445	0.679	Be	Sr	Zr	Hf	Al	In	In	Sc	2.831	0.708	Mg	Zn	Si	Ti	Al	Sc	Y	Y	3.576	0.668	
Sr	Cd	Ge	Hf	Al	Ga	Sc	Sc	1.959	0.761	Mg	Cd	Sn	Hf	Al	Ga	Sc	Sc	2.445	0.806	Be	Sr	Ge	Ti	Al	Sc	Sc	Y	2.831	0.831	Be	Mg	Sr	Ba	Si	Ge	Ge	Zr	3.577	0.427	
Ca	Cd	Si	Zr	In	In	In	Y	1.959	0.957	Mg	Ba	Ge	Hf	Al	In	In	Sc	Y	2.445	0.656	Mg	Sr	Ba	Zn	Si	Sn	Ti	2.831	0.747	Be	Mg	Ti	Zr	Al	Sc	Sc	Y	3.578	0.557	
Zn	Cd	Sn	Ti	In	Al	Sc	Y	1.959	0.816	Mg	Ba	Ba	Cd	Si	Sn	Ti	Hf	2.446	0.589	Be	Ca	Zn	Cd	Ge	Ge	Zr	Hf	2.831	0.541	Mg	Sr	Ba	Ba	Ge	Ti	Zr	Hf	3.579	0.698	
Ba	Zn	Zn	Cd	Si	Ge	Sn	Ti	1.959	0.826	Be	Ba	Ge	Zr	Al	Al	Sc	Y	2.446	0.631	Be	Ba	Ba	Zn	Si	Ge	Sn	Zr	2.831	0.535	Ca	Sr	Ba	Ba	Si	Ge	Sn	Ti	3.580	0.977	
Sr	Cd	Ge	Ti	Al	Al	Ga	In	1.960	0.908	Ca	Ba	Zr	Zr	Ga	In	Sc	Y	2.446	0.560	Mg	Sr	Zn	Zn	Si	Ge	Sn	Hf	2.831	0.612	Be	Mg	Ca	Zn	Ti	Ti	Zr	Hf	3.580	1.062	
Sr	Sr	Ge	Zr	Al	In	Sc	Y	1.960	0.530	Ca	Zn	Ge	Ti	Al	Ga	Ga	Sc	2.446	0.617	Zn	Zn	Ti	Hf	Al	Ga	In	Sc	2.831	0.591	Be	Mg	Ti	Hf	Al	Al	Ga	Y	3.581	0.886	
Ba	Zn	Cd	Cd	Si	Sn	Zr	Hf	1.960	0.534	Be	Ca	Sr	Cd	Sn	Sn	Zr	Hf	2.446	0.677	Mg	Mg	Sn	Ti	Al	Ga	Sc	Y	2.831	0.601	Be	Sr	Ba	Ba	Si	Ge	Sn	Ti	3.581	0.989	
Ca	Sr	Ge	Ti	Ga	Ga	In	Y	1.960	0.426	Be	Ca	Sn	Sn	Al	Sc	Y	Y	2.446	0.789	Ca	Sr	Ti	Hf	Al	Ga	Sc	Sc	2.831	0.794	Mg	Zn	Si	Ti	Ga	Sc	Sc	Y	3.581	1.112	
Mg	Cd	Ge	Sn	Al	Al	Ga	Y	1.960	0.677	Mg	Ca	Ba	Ba	Si	Ge	Sn	Sc	2.446	1.345	Mg	Cd	Sn	Hf	Al	Al	Sc	Y	2.832	0.831	Be	Sr	Ba	Ba	Si	Sn	Zr	Hf	3.581	0.443	
Sr	Ba	Sn	Ti	Al	In	Y	Y	1.960	0.670	Sr	Zn	Si	Si	Al	Ga	Sc	Y	2.446	1.328	Mg	Cd	Ti	Hf	Al	Sc	Ga	Y	Y	2.832	0.737	Be	Mg	Zn	Cd	Si	Si	Ti	Zr	3.583	0.501
Be	Ba	Si	Hf	In	In	Sc	Y	1.961	0.531	Ca	Cd	Zr	Hf	Ga	In	In	Sc	2.446	1.193	Be	Ba	Ti	Hf	Al	Al	Ga	Sc	2.832	0.687	Ca	Sr	Sr	Ba	Si	Ge	Sn	Ti	3.584	0.423	
Be	Ba	Sn	Hf	In	Sc	Sc	Y	1.961	0.682	Ca	Cd	Ti	Hf	Al	Ga	Ga	In	2.446	0.785	Be	Cd	Ti	Zr	Ga	Sc	Y	Y	2.832	0.596	Mg	Mg	Ca	Zn	Si	Ge	Zr	Hf	3.585	0.510	
Sr	Cd	Ti	Hf	Ga	In	In	Y	1.961	0.721	Zn	Cd	Zr	Hf	In	In	Sc	Y	2.446	1.140	Mg	Sr	Ba	Cd	Cd	Ge	Ti	Zr	2.832	0.659	Be	Mg	Ti	Zr	Al	Ga	Ga	Y	3.585	0.562	
Be	Sr	Sn	Zr	Al	Ga	Ga	Y	1.961	0.571	Mg	Ba	Ba	Cd	Si	Sn	Ti	Zr	2.447	1.008	Mg	Sr	Ba	Cd	Si	Ge	Ge	Hf	2.832	0.608	Be	Mg	Zn	Zn	Ge	Ti	Zr	Hf	3.586	0.561	
Mg	Zn	Sn	Hf	Al	In	In	Y	1.962	0.537	Ca	Cd	Sn	Ti	In	Sc	Y	Y	2.447	0.784	Be	Ca	Cd	Cd	Si	Sn	Ti	Zr	2.832	0.697	Mg	Mg	Sr	Ba	Si	Sn	Zr	Hf	3.587	0.600	
Ca	Ba	Zn	Cd	Si	Sn	Zr	Zr	1.962	0.682	Mg	Mg	Ge	Hf	Al	Ga	In	Y	2.447	1.191	Be	Ca	Si	Zr	Al	Al	In	Y	2.832	0.737	Be	Mg	Ti	Zr	Al	Al	Ga	In	3.588	0.593	
Be	Ba	Sn	Ti	Ga	Ga	Sc	Y	1.962	0.531	Mg	Sr	Ti	Hf	Ga	In	In	Sc	2.447	1.062	Be	Be	Ba	Cd	Si	Ge	Zr	Hf	2.832	0.684	Mg	Ca	Sr	Ba	Ge	Ge	Sn	Hf	3.588	0.650	
Mg	Cd	Ge	Hf	Al	In	In	Y	1.962	0.511	Zn	Cd	Si	Si	Ga	In	Sc	Y	2.447	0.910	Ca	Sr	Ba	Cd	Si	Si	Ge	Zr	2.832	0.627	Be	Mg	Sr	Zn	Si	Si	Ti	Hf	3.588	0.663	
Sr																																								

Mg	Sr	Sn	Hf	Al	In	Sc	Sc	1.977	0.855	Mg	Ca	Ge	Hf	Al	Ga	Ga	Sc	2.457	0.699	Mg	Ba	Zn	Cd	Sn	Zr	Zr	Hf	2.843	0.776	Be	Mg	Ba	Ba	Ge	Sn	Ti	Zr	3.627	0.978	
Mg	Ca	Sn	Zr	Al	In	In	Sc	1.978	0.933	Mg	Ca	Ge	Zr	Al	Ga	Ga	In	2.457	0.732	Be	Mg	Sr	Cd	Si	Si	Sn	Ti	2.844	0.680	Be	Ca	Sr	Sr	Ge	Sn	Zr	Hf	3.628	1.112	
Be	Ca	Sn	Zr	Al	Al	In	Y	1.978	1.040	Mg	Sr	Ti	Hf	Al	Ga	In	In	2.457	0.640	Mg	Sr	Ba	Cd	Si	Ti	Ti	Ti	2.844	0.762	Be	Ca	Ba	Ba	Si	Ge	Sn	Zr	3.628	1.161	
Ca	Zn	Sn	Hf	Al	Al	In	Sc	1.978	0.795	Be	Sr	Si	Zr	Al	Ga	Ga	In	2.457	0.673	Mg	Mg	Zn	Cd	Ge	Sn	Ti	Zr	2.844	0.688	Mg	Ca	Ca	Ba	Si	Sn	Zr	Hf	3.628	1.178	
Sr	Ba	Si	Zr	Al	In	In	Y	1.978	0.904	Ca	Sr	Si	Zr	Al	Al	In	Y	2.457	0.704	Be	Ca	Ge	Zr	Al	Al	Al	Ga	Sc	2.844	0.776	Mg	Sr	Sr	Ba	Si	Ge	Sn	Ti	3.628	1.192
Ca	Ca	Zn	Al	Al	Ga	Sc	Y	1.979	1.031	Be	Ba	Ti	Zr	Al	In	Sc	Y	2.457	0.837	Sr	Ba	Ba	Zn	Si	Sn	Ti	Hf	2.844	0.846	Mg	Sr	Ba	Ba	Si	Sn	Ti	Hf	3.629	1.086	
Ba	Zn	Zn	Cd	Si	Sn	Zr	Hf	1.979	0.785	Ba	Cd	Zr	Zr	Al	Ga	Sc	Y	2.457	0.769	Be	Mg	Sn	Hf	Al	Al	In	Sc	2.844	0.769	Mg	Mg	Sr	Ba	Si	Sn	Ti	Zr	3.629	1.193	
Sr	Ba	Ge	Zr	Al	Al	In	Y	1.979	0.768	Mg	Zn	Ge	Sn	Al	Al	Ga	Sc	2.458	0.716	Mg	Ba	Ti	Hf	Al	Al	Sc	Y	2.844	0.703	Mg	Ca	Sr	Ba	Ge	Zr	Zr	Hf	3.630	1.216	
Be	Ba	Sn	Zr	Al	Al	Ga	Y	1.979	0.832	Be	Cd	Si	Zr	Ga	In	In	Y	2.458	0.833	Ca	Cd	Si	Ti	Ti	Al	Ga	Sc	2.844	0.863	Mg	Ca	Ca	Ba	Si	Ge	Ti	Zr	3.630	1.187	
Be	Ba	Ge	Zr	Al	Ga	Ga	In	1.979	0.732	Ba	Zn	Ge	Hf	Al	Sc	Sc	Y	2.458	0.667	Be	Ca	Sr	Cd	Si	Ti	Zr	Zr	2.844	0.752	Be	Mg	Sr	Ba	Si	Ge	Ti	Zr	3.630	1.200	
Ca	Sr	Zn	Cd	Si	Sn	Hf	Hf	1.979	0.742	Ca	Cd	Si	Zr	Ga	In	Sc	Sc	2.458	0.801	Mg	Sr	Ge	Zr	Al	Sc	Y	Y	2.844	0.813	Be	Mg	Ge	Ti	Al	Sc	Sc	Y	3.630	1.109	
Be	Ba	Sn	Zr	Al	Ga	Ga	Sc	1.979	0.820	Be	Sr	Zn	Cd	Sn	Sn	Ti	Hf	2.458	0.947	Mg	Ca	Ba	Cd	Si	Zr	Zr	Hf	2.845	0.964	Be	Ca	Sr	Ba	Si	Ti	Zr	Zr	3.631	1.211	
Mg	Cd	Si	Sn	Al	Al	In	Y	1.979	0.714	Ba	Cd	Zr	Hf	Al	Al	Ga	Y	2.458	0.761	Be	Ba	Zn	Cd	Cd	Ti	Hf	Hf	2.845	0.831	Be	Sr	Ba	Ba	Ge	Sn	Ti	Hf	3.631	1.231	
Sr	Zn	Ge	Zr	Al	Al	In	Sc	1.979	0.880	Sr	Ba	Zn	Zn	Si	Ge	Ti	Zr	2.458	0.622	Mg	Mg	Zn	Cd	Cd	Si	Sn	Ti	Hf	2.845	0.579	Be	Mg	Ba	Ba	Si	Sn	Zr	Hf	3.631	0.436
Ca	Ba	Ge	Hf	Al	Al	In	Y	1.979	0.891	Mg	Ba	Si	Hf	Ga	Ga	Sc	Y	2.458	0.673	Be	Zn	Ti	Zr	Al	In	In	Y	2.845	0.586	Mg	Sr	Ba	Ba	Si	Ge	Sn	Zr	3.631	0.472	
Ca	Ba	Si	Hf	Al	In	In	Y	1.980	0.655	Be	Mg	Sn	Ti	Ga	In	In	Y	2.458	0.666	Mg	Zn	Zn	Cd	Si	Ge	Sn	Ti	2.845	0.693	Be	Mg	Sr	Ba	Si	Si	Ge	Hf	3.631	0.229	
Be	Sr	Ge	Zr	Al	In	In	Sc	1.980	0.817	Mg	Zn	Sn	Zr	Al	Ga	Ga	Y	2.458	0.704	Mg	Cd	Ti	Zr	Al	Al	In	Y	2.845	0.697	Be	Mg	Mg	Ba	Si	Sn	Ti	Hf	3.632	0.352	
Sr	Sr	Zn	Cd	Ge	Sn	Ti	Hf	1.980	0.873	Ca	Ba	Ti	Ti	Al	Ga	In	Y	2.458	0.806	Zn	Cd	Si	Zr	Al	Al	Ga	Y	2.845	0.846	Be	Be	Ca	Ba	Si	Ge	Ti	Hf	3.632	0.457	
Ba	Zn	Si	Si	Ga	In	In	Sc	1.980	1.070	Sr	Sr	Ba	Cd	Si	Sn	Ti	Hf	2.459	0.688	Ca	Sr	Zr	Hf	Al	Al	Sc	Y	2.846	0.793	Be	Ca	Sr	Ba	Sn	Ti	Hf	Hf	3.632	0.735	
Sr	Ba	Sn	Ti	Al	Al	In	Sc	1.980	0.793	Ca	Ba	Sr	Cd	Si	Sn	Ti	Y	2.459	0.783	Be	Zn	Si	Ti	Al	In	Y	Y	2.846	0.795	Be	Be	Mg	Ba	Si	Ge	Ti	Zr	3.632	0.767	
Be	Ba	Si	Ge	In	Sc	Sc	Y	1.981	0.861	Be	Ba	Ti	Hf	In	Sc	Sc	Y	2.459	0.915	Mg	Ca	Zr	Hf	Al	Ga	Sc	Y	2.846	0.937	Be	Mg	Ba	Ba	Si	Sn	Ti	Zr	3.632	0.526	
Be	Cd	Sn	Zr	Al	Ga	In	Y	1.981	1.054	Ca	Ba	Zr	Hf	In	In	Y	Y	2.459	0.776	Sr	Cd	Zr	Hf	Ga	Ga	Sc	Y	2.846	0.863	Be	Mg	Ca	Zn	Ge	Ge	Ti	Zr	3.633	0.641	
Ba	Zn	Si	Sn	Ga	Sc	Sc	Y	1.981	0.917	Zn	Cd	Sn	Hf	Al	Sc	Y	Y	2.459	0.635	Be	Ba	Si	Zr	Al	Sc	Y	Y	2.846	0.578	Be	Mg	Ti	Hf	Al	Ga	Sc	Sc	3.634	0.760	
Mg	Sr	Sn	Ti	Al	In	In	Y	1.981	0.926	Mg	Ca	Zn	Cd	Si	Sn	Zr	Zr	2.459	0.686	Mg	Ca	Ba	Cd	Ge	Ge	Ti	Zr	2.846	0.585	Be	Mg	Si	Zr	Al	Ga	Sc	Sc	3.634	1.123	
Ca	Zn	Ge	Ti	Ga	In	Y	Y	1.981	1.004	Be	Sr	Ti	Zr	Ga	In	In	Sc	2.459	0.686	Sr	Ba	Ti	Hf	Al	Sc	Sc	Y	2.846	0.723	Be	Mg	Mg	Ba	Si	Sn	Zr	Hf	3.634	1.145	
Sr	Cd	Ge	Hf	Al	Al	Ga	Sc	1.981	0.615	Ba	Ba	Si	Zr	Zr	Ga	Sc	Y	2.459	0.664	Mg	Ca	Cd	Cd	Cn	Ti	Zr	Hf	2.846	0.631	Mg	Sr	Ba	Ba	Si	Sn	Zr	Hf	3.635	0.965	
Be	Ba	Ge	Hf	Ga	In	Sc	Sc	1.981	0.619	Sr	Zn	Hf	Hf	Al	In	Sc	Y	2.459	0.733	Be	Be	Sr	Cd	Sn	Ti	Zr	Hf	2.846	0.654	Be	Ca	Ba	Ba	Si	Ge	Sn	Hf	3.636	1.053	
Ba	Cd	Ge	Hf	Al	Al	Sc	Y	1.981	0.511	Mg	Ca	Sn	Zr	Al	Al	Ga	Sc	2.459	0.903	Zn	Zn	Ti	Zr	Al	In	In	Sc	Y	2.847	0.897	Be	Ca	Ba	Zn	Si	Ge	Ge	Ti	3.636	1.154
Ba	Ba	Zn	Cd	Si	Ge	Ti	Zr	1.981	0.278	Ca	Ca	Si	Ti	Al	Ga	In	Y	2.459	1.006	Be	Cd	Si	Zr	Al	Al	Ga	In	2.847	0.940	Be	Mg	Ca	Ba	Sn	Zr	Hf	Hf	3.636	0.645	
Mg	Zn	Ge	Sn	Ga	Ga	Sc	Y	1.981	0.326	Sr	Ba	Si	Ti	Al	Al	In	Y	2.459	0.978	Be	Ca	Ba	Cd	Ti	Ti	Zr	Hf	2.847	0.855	Be	Mg	Mg	Ba	Ba	Sn	Ti	Zr	3.636	0.660	
Ba	Zn	Si	Zr	Al	Ga	In	Sc	1.982	0.213	Be	Ca	Si	Zr	Al	In	In	Y	2.459	0.859	Sr	Zn	Si	Ti	In	Sc	Sc	Y	2.847	0.788	Be	Mg	Ca	Zn	Ge	Ti	Ti	Zr	3.636	0.568	
Sr	Ba	Sn	Zr	Al	Ga	Y	Y	1.982	0.310	Ca	Ba	Ba	Cd	Ge	Sn	Ti	Hf	2.460	0.687	Be	Mg	Sr	Cd	Si	Ge	Ge	Hf	2.848	0.701	Mg	Ca	Sr	Sr	Si	Ge	Sn	Hf	3.637	0.637	
Mg	Sr	Si	Ge	Al	Al	Ga	In	1.982	0.386	Ca	Ba	Ge	Zr	Al	Al	Sc	Y	2.460	0.874	Sr	Cd	Ti	Hf	Ga	Sc	Sc	Y	2.848	0.778	Be	Mg	Sr	Ba	Ge	Zr	Hf	Hf	3.637	0.663	
Ba	Zn	Zn	Cd	Ge	Sn	Zr	Hf	1.982	0.270	Ca	Ba	Si	Zr	Al	In	Y	Y	2.460	0.758	Mg	Sr	Ba	Cd	Si	Ti	Ti	Zr	2.848	0.708	Be	Mg	Zn	Zn	Si	Ge	Ti	Hf	3.637	0.769	
Ca	Cd	Si	Ge	Al	Al	In	Y	1.983	0.263	Ca	Ca	Ba	Cd	Si	Sn	Zr	Hf	2.460	0.736	Mg	Zn	Sn	Ti	Ti	Al	Ga	Ga	Sc	2.848	0.794	Be	Zn	Si	Ti	Al	Ga	Sc	Sc	3.638	0.769
Mg	Ca	Sn	Zr	Al	Ga	In	In	1.983	0.362	Cd	Cd	Zr	Hf	Al	Ga	In	Sc	2.460	0.949	Be	Sr	Zr	Hf	Al	Al	Ga	Y	2.848	0.862	Be	Mg	Sr	Ba	Sn	Ti	Ti	Hf	3.639	0.742	
Be	Sr	Ge	Zr	Ga	Ga	In	Y	1.983	0.248	Sr	Cd	Ti	Hf	Al	Ga	Ga	Sc	2.460	0.834	Ca	Ba	Ge	Zr	Al	Sc	Y	Y	2.848	0.789	Be	Mg	Sr	Ba	Sn	Ti	Hf	Hf	3.639	0.782	
Sr	Ba	Ge	Hf	Ga	In	Y	Y	1.983	0.239	Mg	Sr	Sn	Ti	Al	Al	Sc	Y	2.461	0.777	Zn	Zn	Zr	Hf	Al	Ga	In	Sc	2.848	0.722	Be	Sr	Sr	Ba	Si	Ge	Sn	Ti	3.639	0.767	
Ba	Ba	Sn	Ti	Al	Ga	Sc	Y	1.983	0.357	Sr	Ba	Si	Zr	Al	In	Sc	Sc	2.461	0.978	Be	Ba	Zn	Cd	Cd	Si	Si	Sn	Hf	2.848	0.874	Be	Mg	Sr	Ba	Ge	Zr	Zr	Hf	3.639	0.796
Sr	Ba	Cd	Cd	Si	Ge	Ti	Zr	1.984	0.244	Be	Ba	Si	Ge	Al	Al	Sc	Y	2.461	0.760	Mg	Ca	Ge	Ti	In	Sc	Y	Y	2.848	0.770	Be	Mg	Mg	Zn	Sn	Ti	Zr	Hf	3.639	0.794	
Ca	Sr	Ge	Ga	Al	Sc	Sc	Y	1.984	0.608	Zn	Cd	Si	Ti	In	In	Sc	Y	2.461	0.839	Ca	Ca	Si	Ti	In	Ga	Sc	Y	2.848	0.829	Mg	Ca	Sr	Sr	Si	Ge	Sn	Zr	3.640	0.775	
Sr	Ba	Si	Ge	Ga	Ga	Sc	Y	1.984	0.532	Be	Sr	Ge	Ti	In	Sc	Sc	Y	2.461	1.071	Be	Ca	Sn	Ti	Al	Sc	Sc	Y	2.848	0.976	Be	Mg	Sr	Ba	Si	Ge	Zr	Hf	3.641	0.811	
Mg	Ca	Si	Sn	Al	Al	Ga	Sc	1.984	0.193	Ca	Ba	Si	Ti	Ga	In	Y	Y	2.461	0.834	Be	Ca	Ba	Cd	Si	Ti	Ti	Hf	2.848	0.848	Mg	Sr	Sr	Ba	Si	Ge	Zr	Hf	3.641	0.791	
Ca	Cd	Sn	Ti	Al	Al	Ga	In	1.984	0.487	Be	Ca	Sn	Ti	Al	Al	Ga	In	2.461	0.560	Mg	Ca	Ba	Cd	Si	Ge	Ge	Zr	2.849	0.602	Mg	Ca	Sr	Ba	Ge	Ti	Hf	Hf	3.641	0.640	
Mg	Ca	Ge	Sn	Ga	Sc	Sc	Y	1.985	0.509	Ca	Sr	Ti	Zr	Ga	In	In	Sc	2.461	0.617	Sr	Cd	Si	Ti	Ga	Sc	Y	Y	2.849	0.610	Mg	Ca	Sr	Ba	Ti	Zr	Hf	Hf	3.641		

Ca	Ba	Si	Sn	In	Sc	Y	Y	1998	0.796	Be	Sr	Zn	Cd	Si	Sn	Hf	Hf	2.470	0.653	Ca	Zn	Zr	Hf	Al	Al	In	Sc	2.859	0.837	Be	Sr	Ba	Ba	Si	Ge	Sn	Zr	3.687	0.896	
Mg	Zn	Si	Sn	Al	In	Y	Y	1998	0.862	Be	Sr	Zn	Cd	Si	Sn	Sn	Ti	2.470	0.767	Mg	Ca	Si	Hf	Al	Al	Ga	In	2.859	0.996	Be	Mg	Mg	Zn	Ge	Ti	Zr	Hf	3.688	0.916	
Ca	Sr	Ge	Sn	Al	Sc	Sc	Y	1998	0.817	Mg	Sr	Ge	Sn	Al	Al	Sc	Y	2.470	0.633	Mg	Ca	Zn	Si	Zr	Al	Al	Sc	Y	2.859	0.894	Be	Mg	Ca	Sr	Si	Ge	Ti	Hf	3.689	0.914
Ca	Ba	Ge	Hf	Ga	In	Y	Y	1998	0.774	Mg	Sr	Ge	Hf	In	Sc	Y	Y	2.470	0.728	Be	Ca	Sr	Cd	Ge	Ge	Ti	Hf	2.860	0.926	Be	Mg	Ba	Ba	Si	Ti	Zr	Hf	3.689	0.822	
Sr	Ba	Sn	Ti	Al	In	Sc	Y	1998	0.853	Zn	Cd	Ge	Zr	Al	Ga	Ga	Sc	2.470	0.829	Mg	Ca	Ca	Cd	Ge	Sn	Ti	Hf	2.860	1.086	Be	Mg	Sr	Sr	Si	Ge	Ti	Hf	3.690	0.928	
Mg	Ba	Ge	Hf	Al	In	Y	Y	1999	0.803	Mg	Sr	Ba	Cd	Sn	Sn	Ti	Hf	2.470	0.677	Be	Mg	Sn	Ti	In	Sc	Y	Y	2.860	0.962	Be	Mg	Si	Zr	Al	Ga	Ga	Sc	3.691	0.913	
Be	Cd	Ge	Sn	Al	Al	In	Sc	1999	0.884	Mg	Mg	Sn	Zr	Al	In	Sc	Y	2.471	0.623	Be	Mg	Sn	Zr	Al	Ga	Ga	In	2.860	0.673	Be	Mg	Sr	Sr	Ge	Sn	Zr	Hf	3.692	0.883	
Be	Ba	Si	Ge	In	Sc	Y	Y	1999	0.896	Ca	Ba	Sn	Zr	Ga	Sc	Y	Y	2.471	0.633	Be	Mg	Si	Zr	Al	In	Y	Y	2.860	0.686	Mg	Mg	Ca	Zn	Si	Ge	Ti	Hf	3.692	0.914	
Ca	Sr	Ge	Hf	Ga	Ga	In	Sc	1999	0.747	Mg	Sr	Ti	Hf	Al	In	Y	Y	2.471	0.585	Sr	Ba	Si	Hf	Al	Al	Sc	Y	2.860	0.825	Be	Mg	Ca	Sr	Sn	Zr	Hf	3.692	0.511		
Mg	Sr	Ge	Ti	Ga	Ga	In	Y	1999	0.841	Be	Zn	Sn	Ti	Ga	Ga	In	Y	2.471	0.650	Mg	Cd	Si	Zr	Ga	In	Sc	Sc	2.860	0.816	Be	Mg	Sr	Sr	Sn	Ti	Zr	Hf	3.692	0.682	
Ca	Sr	Si	Hf	Ga	In	In	Y	2000	0.899	Zn	Cd	Zr	Hf	Ga	Ga	In	Y	2.471	0.747	Ca	Sr	Si	Hf	Ga	Sc	Sc	Y	2.860	0.966	Mg	Sr	Sr	Ba	Si	Ti	Zr	Hf	3.693	0.757	
Ca	Zn	Ge	Ge	Al	Ga	Sc	Y	2000	1.143	Ca	Ba	Zn	Cd	Sn	Ti	Zr	Zr	2.471	0.629	Be	Ba	Zn	Zn	Ge	Sn	Ti	Hf	2.860	0.926	Be	Mg	Sr	Ba	Si	Sn	Ti	Ti	3.693	1.251	
Mg	Sr	Sn	Zr	Al	Al	Ga	Y	2000	0.820	Be	Sr	Si	Ge	Al	Ga	Sc	Sc	2.471	0.721	Mg	Zn	Ge	Zr	Al	Al	Ga	Y	2.861	0.896	Be	Mg	Mg	Sr	Si	Sn	Zr	Hf	3.693	1.277	
Mg	Zn	Ge	Sn	Al	Al	Ga	In	2000	0.891	Ba	Cd	Ti	Ti	Al	Ga	Sc	Y	2.471	0.804	Ca	Zn	Si	Zr	Al	Al	Ga	Sc	2.861	1.046	Mg	Mg	Ca	Ba	Ge	Sn	Ti	Zr	3.694	0.856	
Mg	Sr	Si	Ge	Al	In	Sc	Y	2000	1.131	Zn	Cd	Zr	Hf	Ga	In	In	Sc	2.471	0.666	Be	Sr	Ba	Cd	Si	Si	Ge	Hf	2.861	0.985	Be	Ca	Sr	Ba	Ge	Zr	Zr	Hf	3.694	1.017	
Mg	Sr	Sn	Zr	Ga	Ga	Sc	Y	2000	0.919	Ca	Zn	Ti	Zr	Al	Ga	In	In	2.472	0.649	Be	Be	Sr	Ba	Si	Ge	Sn	Hf	2.861	0.658	Mg	Mg	Ca	Ba	Ge	Sn	Ti	Hf	3.694	1.107	
Ca	Cd	Sn	Ti	Ga	Ga	Sc	Y	2000	0.929	Be	Cd	Si	Hf	Al	In	Y	Y	2.472	0.659	Mg	Cd	Hf	Hf	Al	Ga	In	Sc	2.861	0.671	Be	Sr	Ba	Ba	Si	Sn	Ti	Hf	3.695	1.639	
Be	Mg	Sn	Sn	Al	In	Sc	Y	2000	1.082	Mg	Ba	Si	Zr	Al	Al	In	Y	2.472	0.581	Be	Ca	Ca	Cd	Si	Ge	Sn	Ti	2.861	0.844	Be	Ca	Ba	Ba	Ge	Ti	Zr	Hf	3.695	1.654	
Ca	Sr	Sn	Zr	Al	Al	Ga	Sc	2000	0.609	Sr	Ba	Ti	Ti	Al	In	Sc	Y	2.472	0.641	Be	Mg	Cd	Cd	Sn	Ti	Hf	Hf	2.861	0.698	Be	Mg	Ca	Ba	Ti	Zr	Hf	Hf	3.695	1.296	
Zn	Cd	Ge	Zr	Ga	Ga	In	Y	2000	0.614	Mg	Zn	Ge	Ge	Hf	Ga	In	Sc	2.472	0.668	Be	Cd	Si	Hf	Ga	Ga	Sc	Y	2.861	0.727	Be	Mg	Sr	Ba	Si	Si	Ge	Ti	3.697	1.437	
Ba	Zn	Ge	Ti	Al	Al	Ga	Sc	2001	0.530	Be	Mg	Si	Sn	In	Sc	Y	Y	2.472	0.762	Be	Ca	Ti	Zr	Ga	Sc	Y	Y	2.861	0.991	Be	Ca	Ca	Ba	Ge	Sn	Zr	Hf	3.697	1.514	
Sr	Zn	Si	Ge	Al	Al	Ga	In	2001	0.768	Ca	Sr	Si	Zr	In	Ga	In	Y	2.472	0.752	Be	Cd	Ge	Zr	Al	Sc	Y	Y	2.862	0.887	Be	Mg	Ca	Ba	Ti	Zr	Zr	Hf	3.698	0.960	
Be	Ca	Sn	Zr	Al	In	Y	Y	2001	0.771	Be	Sr	Si	Zr	Ga	In	Sc	Sc	2.472	0.692	Be	Be	Sr	Cd	Ge	Ti	Zr	Hf	2.862	0.766	Be	Mg	Ca	Sr	Sn	Zr	Zr	Hf	3.699	0.973	
Ca	Cd	Ge	Zr	Ga	Ga	In	Sc	2001	0.646	Mg	Sr	Si	Si	Al	Ga	In	Sc	2.472	0.652	Mg	Cd	Zr	Hf	Al	Al	Ga	In	2.862	0.730	Mg	Ca	Sr	Ba	Si	Zr	Zr	Hf	3.700	0.766	
Sr	Cd	Si	Zr	Ga	Ga	In	Sc	2002	0.821	Ba	Zn	Hf	Hf	Al	Ga	Sc	Y	2.473	0.590	Be	Ca	Si	Ti	Ga	Ga	In	Sc	2.862	0.615	Be	Sr	Ba	Ba	Si	Ge	Sn	Hf	3.700	0.904	
Sr	Zn	Ge	Zr	Al	Al	Ga	Y	2002	0.829	Ca	Ba	Hf	Ti	Zr	Ga	Ga	In	Y	2.473	0.643	Ca	Zn	Ti	Zr	Al	Al	In	Sc	2.862	0.665	Mg	Ca	Ca	Sr	Sn	Ti	Zr	Hf	3.701	0.920
Ca	Ba	Sn	Ti	Ga	In	Sc	Sc	2002	0.695	Mg	Zn	Ge	Al	Al	In	Y	Y	2.473	0.611	Mg	Ca	Ti	Hf	Al	Al	In	Y	2.862	0.632	Be	Mg	Sr	Sr	Si	Sn	Zr	Hf	3.701	0.980	
Ba	Zn	Sn	Ti	Al	Ga	Sc	Sc	2002	0.668	Mg	Ca	Si	Ge	Al	In	Sc	Sc	2.473	0.653	Mg	Ba	Zn	Cd	Sn	Ti	Ti	Zr	2.862	0.692	Mg	Mg	Ca	Sr	Si	Sn	Zr	Hf	3.701	0.978	
Ca	Ba	Si	Ge	Ga	Ga	Sc	Y	2002	0.780	Ca	Ba	Zn	Cd	Ge	Ti	Hf	Hf	2.473	0.689	Be	Cd	Ge	Zr	Al	Ga	Ga	Sc	2.863	0.698	Mg	Ca	Sr	Ba	Si	Ti	Hf	Hf	3.702	0.875	
Be	Ba	Sn	Zr	In	Sc	Y	Y	2003	0.646	Be	Sr	Ge	Zr	Ga	Sc	Y	Y	2.473	0.659	Mg	Ba	Ti	Zr	Al	Al	Ga	Sc	2.863	0.665	Be	Ca	Ba	Ba	Si	Sn	Ti	Zr	3.702	0.989	
Mg	Sr	Ge	Hf	Al	Ga	Ga	Y	2003	0.640	Mg	Sr	Ba	Cd	Sn	Sn	Ti	Zr	2.473	0.672	Be	Mg	Zn	Cd	Sn	Sn	Ti	Zr	2.863	0.644	Mg	Ca	Ba	Si	Ge	Sn	Hf	3.702	0.978		
Ca	Sr	Ge	Hf	Ga	In	Y	Y	2003	0.771	Zn	Zn	Si	Hf	Al	Ga	In	Y	2.473	0.774	Mg	Sr	Zn	Zn	Ge	Sn	Ti	Zr	2.863	0.804	Be	Mg	Si	Ti	Al	Al	Ga	In	3.703	0.584	
Mg	Cd	Si	Sn	Ga	In	Sc	Sc	2003	0.637	Mg	Zn	Sn	Ti	Al	Ga	Ga	In	2.473	0.647	Be	Sr	Ti	Zr	Al	Al	Ga	Y	2.863	0.731	Be	Mg	Ti	Zr	Al	Ga	Sc	Sc	3.703	0.988	
Be	Mg	Si	Sn	Ga	In	Y	Y	2003	1.045	Mg	Sr	Cd	Cd	Si	Ge	Zr	Hf	2.473	0.748	Mg	Zn	Cd	Cd	Si	Sn	Zr	Hf	2.863	0.734	Mg	Mg	Ca	Sr	Sn	Ti	Zr	Hf	3.704	0.898	
Ba	Zn	Si	Ti	Al	In	In	Sc	2004	1.031	Mg	Ca	Ge	Zr	Al	Ga	Y	Y	2.473	0.837	Mg	Sr	Ba	Cd	Si	Si	Ti	Hf	2.863	0.853	Be	Ca	Sr	Ba	Si	Si	Sn	Ti	3.704	1.009	
Ba	Zn	Ti	Zr	Ga	In	In	Y	2004	0.673	Be	Ba	Cd	Cd	Si	Ge	Sn	Hf	2.473	0.692	Mg	Cd	Si	Ti	Zr	Al	Ga	Y	2.863	0.760	Be	Ca	Sr	Sr	Si	Ge	Sn	Zr	3.704	0.934	
Zn	Cd	Sn	Hf	Al	Al	In	Sc	2004	0.906	Mg	Ca	Cd	Cd	Sn	Sn	Ti	Zr	2.473	0.649	Be	Ba	Si	Zr	Al	Ga	Sc	Y	2.864	0.600	Be	Mg	Ca	Sr	Sn	Sn	Ti	Hf	3.704	0.438	
Zn	Cd	Sn	Hf	Al	Ga	Ga	Y	2004	0.988	Ca	Sr	Ba	Zn	Cd	Sn	Zr	Hf	Hf	2.474	0.659	Be	Zn	Hf	Hf	Ga	In	Sc	Y	2.864	0.576	Be	Ca	Sr	Si	Ge	Ti	Zr	3.706	0.490	
Mg	Cd	Sn	Zr	In	In	Sc	Y	2004	0.616	Ca	Sr	Si	Zr	Al	In	Y	Y	2.474	0.611	Be	Mg	Ge	Hf	Ga	Ga	Sc	Y	2.864	0.623	Mg	Mg	Ca	Ba	Si	Sn	Ti	Zr	3.706	0.210	
Mg	Zn	Hf	Ga	Ga	In	Y	Y	2004	0.879	Sr	Ba	Zr	Hf	Al	Ga	Ga	In	2.474	0.664	Sr	Cd	Zr	Hf	Al	Sc	Y	Y	2.864	0.621	Mg	Ca	Ca	Ba	Si	Ge	Sn	Zr	3.706	0.323	
Ca	Cd	Si	Ge	Ga	Ga	Sc	Y	2004	0.979	Mg	Ba	Ge	Hf	Ga	Sc	Sc	Y	2.474	0.750	Ba	Cd	Ti	Zr	Al	Sc	Y	Y	2.864	0.769	Be	Mg	Ca	Ba	Ge	Zr	Hf	Hf	3.708	0.428	
Ca	Zn	Ge	Sn	Al	Al	Sc	Y	2005	0.606	Be	Mg	Ge	Hf	Ga	In	In	Y	2.474	0.635	Mg	Sr	Si	Ti	In	Sc	Sc	Y	2.864	0.712	Be	Ca	Sr	Ba	Ge	Sn	Ti	Zr	3.709	0.784	
Mg	Ca	Ge	Ti	Ga	Ga	In	Y	2005	0.736	Be	Zn	Ge	Ge	Al	In	Sc	Y	2.474	0.737	Ca	Zn	Zr	Hf	Ga	In	Sc	Sc	2.864	0.703	Be	Mg	Si	Ti	Al	Al	In	Sc	3.710	0.834	
Mg	Sr	Sn	Ti	Al	Al	In	Y	2005	0.796	Mg	Ca	Sn	Zr	Al	Ga	Sc	Sc	2.474	0.803	Ca	Sr	Si	Zr	Al	Al	Sc	Y	2.864	0.809	Be	Ca	Sr	Sr	Si	Ge	Sn	Hf	3.710	0.551	
Ba	Cd	Sn	Hf	In	Sc	Y	Y	2005	0.567	Be	Mg	Si	Ge	In	In	Sc	Y	2.475	0.673	Ca	Ba	Ba	Cd	Ge	Ge	Ti	Zr	2.865	0.732	Be	Mg	Ca	Sr	Sn	Sn	Ti	Zr	3.710	0.655	
Ca	Sr	Si	Ti	Al	In	Y	Y	2005	0.71																															

Ca	Ba	Zn	Cd	Si	Sn	Sn	Ti	2018	0.479	Ca	Ca	Ge	Ti	Al	Ga	Sc	Y	2.482	0.789	Be	Be	Sn	Hf	Al	Ga	Sc	Y	2.874	0.555	Mg	Ca	Sr	Ba	Ge	Ti	Ti	Zr	3.757	0.694	
Ca	Zn	Si	Zr	Ga	In	In	Y	2018	0.366	Ba	Cd	Zr	Hf	Al	Ga	Ga	Sc	2.482	0.704	Be	Ca	Ti	Zr	Ga	In	Sc	Sc	2.874	0.485	Be	Ca	Sr	Ba	Si	Zr	Hf	Hf	3.757	0.401	
Ca	Zn	Ge	Sn	Ga	In	In	Sc	2018	0.471	Mg	Sr	Si	Ti	Ga	Sc	Sc	Y	2.482	1.014	Mg	Sr	Si	Zr	Ga	In	Sc	Sc	2.874	0.713	Be	Mg	Ca	Sr	Ti	Zr	Hf	Hf	3.757	0.551	
Ba	Ba	Ge	Ti	Ga	In	Sc	Y	2018	0.579	Mg	Cd	Ge	Sn	Al	Sc	Sc	Y	2.482	1.385	Be	Mg	Ba	Cd	Si	Si	Ge	Hf	2.874	0.962	Mg	Ca	Sr	Ba	Ge	Ti	Ti	Hf	3.759	0.582	
Ba	Ba	Ge	Ti	Al	Ga	In	Sc	2018	0.797	Be	Sr	Ge	Hf	Al	Al	Sc	Y	2.483	1.216	Ca	Zn	Zr	Zr	Al	Ga	Sc	Y	2.874	0.806	Be	Mg	Ca	Sr	Ge	Sn	Hf	Hf	3.759	1.027	
Cd	Cd	Si	Ge	Al	Ga	In	Sc	2018	0.442	Ba	Cd	Ge	Ti	Ga	Sc	Y	2.483	0.966	Mg	Mg	Zn	Hf	Cd	Si	Sn	Ti	Zr	2.874	0.630	Be	Mg	Ca	Sr	Ge	Zr	Hf	Hf	3.760	1.052	
Zn	Cd	Ge	Zr	Al	Ga	Ga	In	2019	0.571	Ca	Cd	Si	Ti	Al	Al	In	Y	2.483	1.426	Be	Cd	Hf	Hf	Al	Ga	In	Sc	2.875	0.994	Mg	Ca	Ba	Si	Sn	Ti	Zr	3.760	0.736		
Ca	Zn	Sn	Hf	Al	Al	Ga	In	2019	0.785	Sr	Sr	Ti	Hf	Al	Ga	In	Sc	2.483	1.237	Be	Mg	Si	Zr	Al	Al	In	Sc	2.875	0.819	Mg	Mg	Ca	Sr	Si	Sn	Ti	Hf	3.761	0.876	
Be	Ba	Ge	Zr	Al	Ga	Ga	In	2019	0.505	Cd	Cd	Ti	Zr	Al	Ga	In	Sc	2.483	0.801	Sr	Zn	Ti	Zr	In	Al	Sc	Sc	2.875	0.489	Mg	Ca	Ba	Si	Sn	Ti	Hf	3.761	0.923		
Ca	Zn	Sn	Hf	Al	Al	Ga	In	2019	0.525	Be	Sr	Ge	Zr	Al	Ga	Sc	Sc	2.483	0.924	Be	Be	Si	Ge	Ga	In	Sc	Y	2.875	0.622	Be	Mg	Ca	Zn	Si	Ge	Ti	Ti	3.761	1.427	
Mg	Cd	Sn	Ti	Ga	In	Y	Y	2019	0.701	Ca	Ba	Zr	Hf	Al	Ga	In	In	2.483	0.881	Be	Ca	Ge	Hf	Al	Sc	Sc	Y	2.875	0.579	Mg	Ca	Ba	Si	Ge	Ti	Zr	3.762	1.439		
Zn	Cd	Ge	Hf	In	In	Sc	Y	2020	0.401	Mg	Ba	Si	Hf	Al	Al	Ga	Y	2.483	0.854	Be	Sr	Ba	Zn	Ge	Ge	Sn	Ti	2.875	0.512	Be	Ca	Ba	Si	Sn	Zr	Hf	3.762	1.168		
Zn	Cd	Ge	Zr	Al	In	In	Sc	2020	0.414	Mg	Zn	Ge	Zr	Al	Ga	Y	Y	2.483	0.993	Ca	Sr	Ge	Ti	Ga	Sc	Y	Y	2.875	0.657	Mg	Ca	Sr	Ba	Ge	Ge	Ti	Zr	3.762	1.292	
Sr	Zn	Sn	Ti	Al	In	In	Sc	2020	0.365	Ca	Ba	Ge	Ti	Zr	Al	Ga	Ga	Y	2.483	1.176	Ca	Cd	Ti	Hf	Al	Al	Ga	Sc	2.875	0.815	Be	Mg	Ca	Sr	Ti	Zr	Zr	Hf	3.762	1.327
Sr	Ba	Sn	Zr	Al	Ga	Ga	Sc	2020	0.429	Ca	Zn	Zn	Cd	Si	Sn	Ti	Hf	2.483	0.887	Mg	Ca	Sr	Cd	Ge	Zr	Hf	Hf	2.875	1.150	Mg	Ca	Ca	Sr	Ge	Sn	Ti	Hf	3.764	0.803	
Sr	Ba	Ge	Ti	Al	Ga	Ga	Sc	2020	0.509	Ca	Cd	Ge	Ti	Al	Ga	Sc	Sc	2.483	0.885	Be	Mg	Ba	Zn	Ge	Ge	Sn	Zr	2.876	1.200	Mg	Ca	Ca	Sr	Ge	Sn	Ti	Zr	3.764	0.805	
Sr	Cd	Ti	Hf	Al	Ga	In	In	2021	0.402	Be	Ba	Sn	Ti	Al	In	Sc	Sc	2.483	0.810	Be	Ca	Ba	Cd	Ti	Zr	Hf	Hf	2.876	1.145	Mg	Ca	Sr	Ba	Si	Sn	Zr	3.765	0.672		
Ca	Zn	Sn	Hf	Ga	In	Sc	Sc	2021	0.566	Mg	Ba	Ba	Cd	Si	Ge	Sn	Zr	2.484	0.520	Ca	Zn	Ti	Zr	Al	Al	Ga	In	2.876	0.724	Mg	Ca	Sr	Ba	Ge	Ge	Ti	Hf	3.765	0.801	
Ca	Cd	Si	Sn	Al	Ga	Sc	Sc	2021	0.576	Sr	Ba	Cd	Cd	Ti	Ti	Zr	Hf	2.484	0.782	Be	Cd	Ge	Zr	Al	Ga	Sc	Sc	2.876	1.025	Mg	Ca	Ba	Ba	Si	Ge	Ti	Hf	3.765	0.768	
Sr	Ba	Si	Sn	In	Sc	Y	Y	2021	0.467	Ca	Zn	Cd	Ti	Hf	Al	Ga	Y	Y	2.484	0.712	Be	Be	Sr	Ba	Si	Ge	Sn	Zr	2.876	0.969	Mg	Mg	Ca	Sr	Ge	Sn	Ti	Zr	3.765	0.852
Ca	Ba	Sn	Hf	Al	Ga	Sc	Sc	2021	0.414	Ba	Cd	Si	Ti	Al	Al	Ga	Sc	2.484	0.522	Ca	Cd	Si	Ti	Al	Al	Ga	Sc	2.876	0.617	Be	Mg	Ca	Sr	Ge	Zr	Zr	Hf	3.767	0.836	
Zn	Cd	Si	Sn	Al	Ga	Ga	Sc	2022	0.549	Be	Ba	Si	Zr	Al	Al	Ga	In	2.484	0.841	Mg	Ca	Ba	Cd	Cd	Si	Si	Zr	Hf	2.876	1.040	Mg	Ca	Sr	Sr	Si	Ti	Zr	Hf	3.767	0.784
Ca	Ba	Cd	Cd	Si	Ge	Zr	Hf	2022	0.442	Ca	Zn	Ti	Zr	In	In	Sc	Y	2.484	0.772	Ca	Ba	Zn	Cd	Ti	Zr	Hf	Hf	2.876	0.980	Be	Ca	Sr	Ba	Si	Zr	Zr	Hf	3.768	0.897	
Sr	Ba	Si	Ti	Ga	In	In	Y	2022	0.386	Mg	Ca	Zn	Cd	Ge	Ge	Sn	Hf	2.484	0.646	Be	Ca	Sr	Zn	Si	Ge	Ge	Zr	2.876	0.844	Be	Ca	Ba	Si	Ge	Sn	Ti	3.769	0.837		
Be	Ba	Sn	Ti	Al	In	In	Sc	2022	0.544	Sr	Cd	Ti	Hf	Al	In	In	Sc	2.484	0.897	Be	Cd	Ge	Zr	Al	In	Sc	Sc	2.876	1.089	Mg	Ca	Sr	Ba	Si	Ge	Ge	Ti	3.769	0.867	
Ba	Cd	Ti	Hf	In	In	Sc	Y	2022	0.437	Ca	Zn	Zn	Cd	Ge	Sn	Ti	Hf	2.484	0.688	Be	Ca	Si	Zr	Al	Al	Ga	Ga	Y	2.876	0.897	Be	Mg	Ca	Sr	Si	Ge	Hf	3.769	0.849	
Sr	Cd	Si	Hf	Al	Al	In	Y	2022	0.756	Ba	Zn	Ge	Zr	Al	Sc	Y	Y	2.484	0.662	Mg	Zn	Ti	Hf	Ga	In	In	Sc	2.876	0.749	Mg	Sr	Sr	Ba	Si	Ge	Ti	Zr	3.770	0.807	
Ca	Zn	Ge	Zr	Ga	Ga	In	Sc	2022	0.669	Mg	Ca	Ge	Hf	Al	Al	Ga	In	2.484	0.974	Be	Sr	Ba	Zn	Ge	Ge	Sn	Zr	2.876	1.122	Be	Mg	Sr	Sr	Ge	Ti	Zr	Hf	3.770	0.917	
Ba	Zn	Ti	Zr	Al	In	Ga	Y	2023	0.357	Ca	Sr	Sn	Ti	In	Sc	Y	Y	2.485	0.747	Mg	Zn	Si	Zr	Ga	Ga	In	Sc	2.877	0.908	Be	Mg	Ca	Sr	Sr	Sn	Ti	Hf	3.771	0.855	
Ba	Zn	Si	Ge	Al	Al	Ga	Y	2023	0.610	Be	Sr	Si	Zr	Ga	Ga	In	Sc	2.485	0.508	Mg	Zn	Ge	Zr	Ga	Sc	Y	Y	2.877	0.601	Be	Ca	Sr	Ba	Si	Sn	Hf	3.771	0.658		
Be	Sr	Sn	Hf	Al	Al	In	Sc	2023	0.642	Ca	Zn	Si	Zr	Ga	Ga	Sc	Y	2.485	0.596	Ca	Ba	Si	Ti	Al	Al	Ga	Sc	2.877	0.745	Be	Mg	Zr	Hf	Al	Ga	Ga	Sc	3.771	0.738	
Mg	Ba	Ge	Hf	Al	Al	In	Y	2023	0.322	Be	Cd	Sn	Zr	Al	In	Sc	Sc	2.485	0.514	Mg	Ca	Cd	Cd	Si	Sn	Ti	Zr	2.877	0.672	Mg	Ca	Ba	Si	Ge	Zr	Hf	3.771	0.491		
Be	Zn	Si	Sn	Ga	In	In	Sc	2023	0.582	Be	Sr	Si	Si	Al	In	Sc	Y	2.485	0.666	Zn	Cd	Si	Hf	Ga	Sc	Y	Y	2.877	0.874	Be	Mg	Ca	Sr	Ge	Sn	Zr	Zr	3.772	0.582	
Be	Zn	Si	Sn	In	In	Sc	Y	2023	0.637	Sr	Ba	Ti	Hf	Al	Ga	Ga	Sc	2.485	0.895	Be	Mg	Sn	Ti	Al	Al	In	Y	2.877	1.089	Be	Ca	Sr	Sr	Si	Sn	Ti	Zr	3.773	0.678	
Ca	Cd	Ge	Hf	Al	Ga	Ga	Sc	2023	0.316	Zn	Cd	Ge	Zr	Al	Al	Ga	Y	2.485	0.738	Zn	Cd	Ti	Zr	In	In	Sc	Sc	2.877	0.937	Mg	Mg	Ca	Sr	Si	Sn	Ti	Zr	3.774	1.030	
Mg	Ca	Si	Sn	Al	Al	Ga	Y	2023	0.425	Ca	Ba	Ca	Cd	Ge	Sn	Zr	Hf	2.485	0.681	Be	Sr	Zr	Hf	Al	Ga	Ga	Sc	2.877	0.786	Be	Mg	Si	Ti	Al	Al	Ga	Y	3.775	1.107	
Mg	Ba	Ge	Ti	Al	Ga	Ga	In	2023	0.527	Be	Sr	Cd	Cd	Ge	Sn	Ti	Zr	2.486	0.970	Be	Ca	Zr	Hf	Al	Ga	Ga	Sc	Y	2.878	1.121	Be	Mg	Ti	Hf	Al	Ga	Ga	Sc	3.775	0.853
Zn	Cd	Si	Sn	In	Sc	Y	Y	2023	0.357	Be	Cd	Si	Ge	Al	Al	In	Y	2.486	0.962	Ca	Ba	Ba	Zn	Si	Ge	Sn	Zr	2.878	0.949	Mg	Sr	Sr	Ba	Si	Ge	Ti	Hf	3.777	0.935	
Be	Sr	Ge	Ti	Ga	Ga	In	Y	2023	0.397	Ca	Sr	Ti	Hf	Al	Ga	Ga	Y	2.486	0.593	Be	Sr	Ti	Hf	Al	Ga	Ga	Sc	2.878	0.668	Be	Mg	Ca	Sr	Si	Sn	Hf	Hf	3.778	1.049	
Ca	Zn	Ge	Sn	Ga	Sc	Y	Y	2024	0.519	Be	Ba	Ge	Ti	Ga	Sc	Y	Y	2.486	0.650	Mg	Cd	Zr	Zr	Al	In	Sc	Y	2.878	0.804	Mg	Zn	Si	Ti	Al	Sc	Sc	Y	3.779	1.423	
Sr	Ba	Ge	Hf	Al	In	Y	Y	2024	0.345	Sr	Cd	Ti	Zr	Al	Al	In	Sc	2.486	0.575	Mg	Mg	Ge	Ti	Al	In	Sc	Y	2.878	0.742	Mg	Ca	Ca	Sr	Si	Ge	Sn	Ti	3.781	1.487	
Mg	Cd	Si	Sn	Al	Ga	Ga	Y	2024	0.469	Ba	Zn	Ti	Hf	Al	Ga	Ga	Sc	2.486	0.600	Ca	Ba	Ti	Hf	Ga	Sc	Sc	Y	Y	2.878	0.691	Be	Mg	Ba	Ba	Si	Ge	Ti	Hf	3.782	1.260
Ca	Ba	Sn	Zr	Al	Ga	Y	Y	2024	0.488	Be	Sr	Ti	Hf	Al	In	In	Sc	2.486	0.704	Be	Mg	Si	Zr	In	In	Sc	Y	2.878	0.840	Be	Mg	Ca	Sr	Sn	Ti	Zr	Zr	3.782	1.322	
Ca	Sr	Ge	Hf	Al	Al	In	Y	2024	0.267	Be	Be	Ca	Cd	Si	Ge	Sn	Zr	2.486	0.841	Be	Sr	Zn	Zn	Si	Sn	Zr	Hf	2.879	0.975	Be	Mg	Ca	Sr	Si	Ge	Ge	Zr	3.783	1.422	
Sr	Cd	Ti	Zr	Al	In	In	Y	2024	0.835	Ca	Ba	Zn	Zn	Ge	Sn	Ti	Hf	2.487	0.859	Be	Ca	Ti	Zr	In	In	Sc	Sc	Y	2.879	0.785	Be	Ca	Sr	Sr	Si	Sn	Ti	Hf	3.783	0.737
Mg	Zn	Ge	Ge	Al	Ga	In	Y	2024	0.750	Mg	Zn																													

Sr	Ba	Sn	Hf	Al	Al	Sc	Y	2.039	1.220	Mg	Sr	Ge	Zr	Al	Ga	Sc	Sc	2.494	1.398	Be	Mg	Ca	Cd	Ge	Sn	Zr	Zr	2.890	0.674	Mg	Ca	Sr	Sr	Si	Ge	Ti	Hf	3.843	1.096		
Mg	Sr	Si	Sn	Al	Ga	Sc	Sc	2.039	1.008	Ca	Sr	Zr	Hf	Ga	In	In	Sc	2.494	0.889	Ca	Ba	Ba	Zn	Si	Sn	Ti	Hf	2.890	0.642	Be	Ca	Sr	Ba	Si	Ge	Ti	Hf	3.843	1.204		
Ba	Cd	Si	Sn	Al	In	Y	Y	2.039	1.025	Be	Mg	Zn	Cd	Sn	Zr	Zr	Hf	2.494	1.021	Be	Mg	Ca	Sn	Si	Sn	Hf	2.890	0.745	Be	Sr	Ba	Ba	Si	Ge	Ti	Hf	3.845	1.564			
Sr	Cd	Si	Zr	Al	Ga	Ga	Y	2.040	1.140	Mg	Zn	Sn	Hf	Ga	In	Sc	Sc	2.494	1.049	Mg	Ca	Si	Hf	Al	Al	In	Sc	2.890	0.655	Be	Ca	Sr	Sr	Ge	Sn	Ti	Hf	3.846	1.634		
Mg	Ba	Ge	Ti	Ga	In	Y	Y	2.040	0.823	Be	Sr	Ge	Zr	Al	Al	Ga	Sc	2.494	0.941	Ca	Sr	Si	Zr	In	Sc	Y	2.890	0.630	Be	Ca	Sr	Sr	Si	Ti	Zr	Hf	3.846	1.419			
Ca	Cd	Ge	Hf	Al	Al	In	Sc	2.040	0.834	Mg	Sr	Si	Ti	Al	Ga	Ga	In	2.494	1.089	Sr	Zn	Si	Zr	Al	Al	Sc	Y	2.891	0.745	Mg	Ca	Ba	Ba	Si	Ge	Ti	Zr	3.846	1.477		
Be	Ca	Si	Sn	In	Sc	Sc	Y	2.040	0.748	Be	Ba	Ge	Ti	Ga	Sc	Sc	Y	2.495	1.332	Be	Zn	Sn	Ti	Al	Ga	Ga	Y	2.891	0.830	Be	Mg	Ca	Sr	Si	Ge	Sn	Zr	3.847	1.571		
Ca	Sr	Si	Ge	Ga	Ga	Sc	Y	2.040	0.827	Sr	Ba	Zn	Cd	Si	Ti	Ti	Zr	2.495	1.020	Ca	Ca	Ba	Zn	Si	Sn	Zr	Hf	2.891	1.331	Be	Mg	Ca	Ca	Si	Ge	Sn	Zr	3.848	0.877		
Sr	Sr	Ge	Ti	Al	Ga	In	Sc	2.040	0.814	Ca	Sr	Ge	Zr	Al	Al	Sc	Y	2.495	1.025	Ca	Ba	Ba	Cd	Ti	Zr	Zr	Hf	2.891	1.389	Be	Mg	Ca	Ba	Si	Ti	Hf	3.850	0.928			
Be	Sr	Sn	Hf	In	Sc	Y	Y	2.040	0.703	Mg	Ca	Sr	Cd	Si	Sn	Sn	Zr	2.495	0.929	Mg	Ca	Sr	Cd	Si	Ti	Hf	Hf	2.891	1.314	Be	Mg	Ca	Sr	Ba	Si	Ge	Ti	3.850	0.766		
Be	Ca	Ge	Ge	Al	Ga	In	Sc	2.041	0.883	Mg	Sr	Si	Ti	Ga	Ga	In	Sc	2.495	0.663	Mg	Zn	Sn	Hf	Ca	Sc	Sc	Y	2.891	0.905	Be	Ca	Ca	Sr	Si	Ge	Sn	Hf	3.850	0.825		
Mg	Cd	Ge	Ti	Al	Ga	In	In	2.041	0.900	Ca	Sr	Sn	Ti	Ga	Sc	Sc	Y	2.495	0.925	Be	Mg	Cd	Cd	Si	Ge	Sn	Ti	2.891	1.218	Be	Mg	Ca	Sr	Si	Si	Ge	Hf	3.851	0.837		
Ba	Cd	Si	Hf	Ga	In	Sc	Sc	2.041	0.784	Ca	Sr	Zr	Zr	Ga	In	Sc	Y	2.495	0.832	Mg	Mg	Si	Zr	Al	Ga	In	Y	2.891	1.140	Be	Mg	Ca	Sr	Ge	Ti	Hf	Hf	3.852	0.886		
Be	Cd	Si	Sn	Al	Al	Ga	In	2.041	0.714	Sr	Ba	Zn	Cd	Ge	Zr	Hf	Hf	2.495	0.662	Be	Ca	Si	Si	Al	Ga	In	Sc	2.891	0.789	Be	Mg	Sr	Ba	Si	Ge	Ti	Ti	3.853	0.913		
Ca	Ba	Ge	Zr	Al	Al	Ga	Y	2.041	0.855	Be	Ca	Si	Hf	Al	In	Y	Y	2.495	0.990	Mg	Ba	Ba	Zn	Ge	Sn	Ti	Hf	2.891	1.238	Be	Ca	Ca	Ba	Ge	Ti	Zr	Hf	3.853	0.781		
Mg	Sr	Si	Hf	Ga	In	In	Y	2.041	0.739	Be	Ca	Si	Sn	Al	Sc	Sc	Y	2.495	0.898	Be	Cd	Zr	Hf	Ga	Ga	Sc	Y	2.891	1.157	Be	Ca	Ba	Ba	Si	Ge	Ti	Zr	3.854	0.826		
Ca	Ba	Zn	Cd	Ge	Sn	Sn	Ti	2.041	0.682	Sr	Ba	Sn	Ti	Zr	Al	Sc	Sc	Y	2.495	0.728	Zn	Cd	Ti	Hf	In	Sc	Sc	Y	2.891	1.014	Be	Mg	Mg	Ba	Si	Ge	Zr	Hf	3.854	0.799	
Be	Sr	Sn	Hf	Al	Al	In	Y	2.042	0.846	Mg	Ca	Ba	Cd	Si	Si	Ge	Sn	Y	2.495	1.072	Mg	Ba	Ba	Zn	Zn	Si	Ge	Zr	Hf	2.891	1.264	Be	Ca	Sr	Sr	Si	Ge	Zr	Hf	3.855	0.896
Be	Sr	Sn	Hf	Al	Al	Ga	Y	2.042	0.730	Ba	Ba	Ti	Zr	Al	Ga	In	Sc	2.495	0.802	Zn	Zn	Ti	Zr	Al	Ga	In	Sc	2.891	1.060	Be	Mg	Ca	Ba	Si	Ti	Ti	Zr	3.856	0.919		
Be	Ca	Ge	Zr	Ga	In	Ga	Y	2.042	1.087	Be	Mg	Ge	Hf	Al	In	Y	Y	2.495	0.790	Mg	Zn	Si	Ti	Al	In	In	Sc	2.891	0.911	Be	Mg	Ca	Sr	Ge	Sn	Ti	Ti	3.856	0.790		
Mg	Ca	Sn	Ti	Ga	In	Y	Y	2.042	1.107	Ba	Cd	Ge	Zr	Al	Sc	Sc	Y	2.496	1.105	Ca	Cd	Zr	Hf	Ga	Sc	Y	Y	2.892	1.303	Mg	Mg	Ca	Sr	Si	Ge	Zr	Hf	3.858	0.834		
Ca	Zn	Sn	Ti	Al	Ga	Ga	Y	2.042	0.773	Ca	Ba	Zr	Zr	Al	In	Sc	Y	2.496	0.866	Zn	Cd	Zr	Hf	Al	Al	Sc	Y	2.892	1.076	Be	Mg	Mg	Zn	Si	Ge	Ti	Zr	3.861	0.801		
Be	Sr	Ge	Hf	Al	Ga	Ga	In	2.042	0.921	Mg	Ca	Ba	Cd	Si	Sn	Sn	Ti	2.496	0.576	Be	Ca	Si	Ti	Al	Ga	Ga	In	2.892	0.706	Be	Mg	Ca	Sr	Ge	Ti	Zr	Zr	3.864	0.797		
Ca	Cd	Si	Sn	In	Sc	Y	Y	2.043	1.061	Ca	Zn	Si	Hf	Ga	In	Sc	Sc	2.496	0.673	Sr	Sr	Ba	Ba	Zn	Si	Sn	Ti	Zr	2.892	0.864	Be	Mg	Ca	Sr	Si	Si	Ge	Zr	3.864	0.859	
Mg	Cd	Si	Sn	Ga	Ga	Sc	Y	2.043	0.717	Mg	Mg	Sn	Hf	Al	Ga	In	Sc	2.496	0.639	Mg	Ba	Ba	Zn	Si	Sn	Ti	Zr	2.892	0.836	Be	Mg	Si	Ti	Al	Ga	Sc	Sc	3.864	0.598		
Mg	Sr	Sn	Zr	Al	Ga	Ga	Y	2.043	0.889	Be	Ca	Si	Ge	Al	Ga	Y	Y	2.496	0.788	Be	Zn	Ti	Zr	Al	Ga	Y	Y	2.892	1.039	Be	Ca	Ba	Ba	Si	Sn	Ti	Zr	3.865	0.687		
Mg	Sr	Sn	Zr	Al	In	Sc	Sc	2.043	1.052	Ca	Sr	Sr	Cd	Si	Ge	Sn	Hf	2.496	1.012	Mg	Ba	Ba	Zn	Cd	Si	Si	Ge	Zr	2.892	1.259	Be	Mg	Ca	Sr	Si	Ge	Ti	Zr	3.865	0.758	
Sr	Zn	Ge	Sn	Al	Sc	Sc	Y	2.043	0.707	Be	Zn	Ge	Sn	Ga	Sc	Sc	Y	2.496	0.866	Mg	Ba	Ba	Zn	Cd	Ge	Zr	Zr	Hf	2.892	1.116	Be	Ca	Ba	Ba	Si	Ge	Ti	Hf	3.866	1.161	
Sr	Ba	Si	Sn	Al	Al	Sc	Y	2.043	0.792	Be	Ba	Zr	Hf	Ga	Ga	In	Y	2.496	0.799	Zn	Cd	Zr	Hf	Ga	Sc	Sc	Y	2.892	0.941	Be	Ca	Sr	Ba	Ge	Ti	Zr	Hf	3.866	1.222		
Mg	Sr	Si	Ge	Ga	Ga	Sc	Y	2.044	0.880	Be	Cd	Ge	Zr	Al	Al	In	Y	2.496	1.093	Ca	Zn	Ti	Hf	Al	Ga	Ga	Sc	Y	2.892	1.296	Mg	Ca	Sr	Si	Ti	Zr	Hf	3.869	0.950		
Ca	Ca	Sn	Ti	Al	In	Sc	Y	2.044	0.654	Mg	Sr	Si	Si	Al	In	Sc	Y	2.496	0.926	Mg	Mg	Si	Zr	Ga	In	Sc	Y	2.893	1.134	Be	Mg	Ca	Ba	Si	Si	Ge	Ti	3.870	1.030		
Be	Sr	Ba	Cd	Si	Ge	Ge	Sn	2.044	0.761	Be	Mg	Ba	Cd	Ge	Ge	Sn	Hf	2.496	0.621	Mg	Ca	Zr	Hf	Al	Al	In	Y	2.893	0.766	Be	Mg	Ca	Sr	Si	Sn	Ti	Ti	3.871	1.121		
Mg	Ba	Ge	Ti	Al	Ga	Ga	Y	2.044	0.868	Sr	Cd	Ge	Zr	Ga	Sc	Sc	Y	2.496	0.717	Be	Ba	Ba	Zn	Si	Sn	Zr	Hf	2.893	0.917	Be	Mg	Mg	Sr	Si	Ti	Zr	Hf	3.872	1.549		
Ca	Ba	Ge	Zr	Al	Al	In	Y	2.044	0.637	Ca	Sr	Cd	Cd	Ge	Ti	Zr	Hf	2.497	0.716	Ca	Zn	Si	Hf	Ca	Sc	Y	Y	2.893	0.924	Be	Ca	Ca	Ba	Si	Sn	Ti	Hf	3.873	1.597		
Sr	Zn	Si	Ti	Ga	In	Y	Y	2.044	0.882	Ca	Zn	Ge	Ti	Al	Al	Ga	Y	2.497	0.658	Be	Ca	Sr	Zn	Ge	Sn	Zr	Zr	2.893	0.790	Be	Mg	Sr	Sr	Si	Ge	Zr	Hf	3.875	1.348		
Sr	Zn	Ti	Hf	Ga	In	In	Y	2.045	0.898	Ba	Zn	Ge	Ti	Ga	Sc	Y	Y	2.497	0.771	Ba	Zn	Ti	Zr	Al	Sc	Y	Y	2.893	0.954	Be	Ca	Sr	Ba	Ge	Ti	Hf	Zr	3.877	1.411		
Be	Cd	Sn	Hf	In	In	Sc	Y	2.045	0.567	Zn	Cd	Ge	Ti	Al	Al	In	Sc	2.497	0.969	Mg	Ca	Ti	Hf	In	Sc	Sc	Y	Y	2.893	1.146	Be	Mg	Si	Ti	Al	Ga	Ga	Sc	3.877	1.488	
Be	Ba	Sn	Hf	Al	Ga	Sc	Sc	2.045	1.173	Ba	Cd	Ti	Hf	Al	Ga	Sc	Sc	2.497	0.979	Mg	Ca	Sr	Cd	Sn	Zr	Zr	Hf	2.893	0.946	Be	Ca	Sr	Ba	Si	Ti	Ti	Zr	3.880	0.879		
Ca	Sr	Si	Ge	Al	In	Y	Y	2.045	1.188	Mg	Sr	Sn	Hf	Al	Sc	Sc	Y	Y	2.497	0.983	Ca	Sr	Ti	Zr	Al	Ga	Sc	Sc	2.893	1.001	Be	Mg	Ca	Sr	Si	Ti	Hf	Hf	3.881	0.909	
Sr	Ba	Ge	Zr	Ga	In	Y	Y	2.045	0.972	Ca	Sr	Ba	Cd	Sn	Sn	Ti	Hf	2.497	0.915	Be	Mg	Ca	Cd	Si	Sn	Zr	Zr	2.893	0.943	Mg	Ca	Sr	Ba	Si	Si	Ge	Hf	3.882	0.724		
Ca	Zn	Ge	Zr	Al	Ga	Y	Y	2.045	1.002	Ca	Zn	Si	Ti	Ga	In	In	Sc	2.497	0.779	Mg	Cd	Si	Zr	Al	Al	In	Sc	2.894	0.711	Be	Sr	Sr	Ba	Si	Ge	Ti	Zr	3.883	0.788		
Mg	Mg	Ge	Sn	Al	In	Sc	Y	2.045	1.144	Be	Ba	Zr	Hf	Al	Ga	Y	Y	2.498	0.944	Sr	Ba	Ba	Zn	Si	Ge	Sn	Ti	2.894	0.902	Be	Ca	Sr	Ba	Si	Ge	Zr	Hf	3.884	0.783		
Ca	Ba	Sn	Ti	Al	Al	In	Sc	2.045	0.917	Be	Zn	Ge	Hf	Al	Ga	Y	Y	2.498	0.878	Mg	Ba	Ba	Zn	Ge	Sn	Ti	Zr	2.894	0.840	Be	Mg	Si	Ti	Al	Sc	Sc	Y	3.884	0.891		
Ba	Zn	Ti	Hf	Ga	In	Y	Y	2.046	0.969	Mg	Ca	Cd	Cd	Ge	Sn	Ti	Zr	2.498	0.796	Be	Ca	Si	Hf	Al	Al	Ga	In	2.894	0.643	Be	Mg	Sr	Sr	Si	Ge	Ti	Hf	3.885	0.900		
Ca	Cd	Sn	Ti	Al	Ga	Ga	Sc	2.046	1.135	Be	Zn	Sn	Hf	Ga	Ga	In	Sc	2.498	1.020	Mg	Mg	Ba	Cd	Ge	Sn	Ti	Hf	2.895	0.950	Be	Ca	Sr	Ba	Si	Ge	Ge					

Ba	Zn	Si	Ti	Al	In	Y	Y	2.060	0.802	Be	Ca	Ge	Hf	Al	In	Sc	Sc	2.505	1.134	Mg	Ca	Sr	Zn	Si	Sn	Sn	Hf	2.907	1.165	Be	Mg	Mg	Ca	Si	Sn	Ti	Hf	4.139	0.752
Ca	Ba	Ge	Zr	Ga	In	Y	Y	2.060	0.892	Be	Sr	Si	Hf	Al	Al	In	Y	2.505	1.129	Be	Mg	Ba	Cd	Ge	Ge	Zr	Hf	2.907	1.213	Be	Mg	Ca	Ca	Si	Sn	Ti	Hf	4.147	0.728
Ca	Zn	Ge	Zr	Al	Ga	Ga	In	2.060	0.817	Be	Ca	Ba	Cd	Sn	Sn	Ti	Hf	2.505	1.047	Be	Mg	Ca	Zn	Si	Sn	Sn	Zr	2.907	1.144	Be	Mg	Ca	Ca	Ge	Sn	Ti	Zr	4.147	0.512
Mg	Ba	Si	Ge	Al	In	Sc	Sc	2.060	0.982	Sr	Cd	Ge	Hf	Al	Sc	Y	Y	2.506	0.943	Be	Mg	Cd	Cd	Ge	Sn	Ti	Hf	2.908	0.925	Be	Mg	Mg	Ca	Si	Sn	Ti	Zr	4.156	0.597
Sr	Ba	Ge	Ti	Ga	Ga	In	Sc	2.060	1.011	Ca	Ba	Zr	Hf	Ga	Ga	In	Y	2.506	1.086	Be	Ca	Si	Zr	Al	In	Sc	Sc	2.908	1.106	Be	Mg	Ca	Ca	Si	Sn	Ti	Zr	4.157	0.596
Ca	Sr	Ge	Zr	Ga	Ga	In	Sc	2.061	0.937	Ca	Sr	Ba	Cd	Ge	Ge	Zr	Hf	2.506	1.005	Ca	Zn	Zr	Hf	Al	Al	Ga	Y	2.908	1.032	Be	Mg	Mg	Ca	Ge	Ti	Zr	Hf	4.183	0.798
Mg	Sr	Sn	Ti	Al	Al	Ga	In	2.061	0.785	Ca	Sr	Ba	Cd	Sn	Sn	Ti	Zr	2.506	0.954	Sr	Zn	Ti	Hf	Ga	Sc	Sc	Y	2.908	0.843	Be	Mg	Ca	Ca	Ge	Ti	Zr	Hf	4.195	0.762
Ca	Sr	Sn	Ti	Ga	Ga	Sc	Y	2.061	0.984	Sr	Zn	Zr	Hf	Ga	Ga	In	Sc	2.506	1.150	Mg	Sr	Si	Ti	In	Sc	Y	Y	2.908	1.141	Be	Mg	Ca	Ca	Si	Ti	Zr	Hf	4.221	0.615
Sr	Zn	Si	Hf	Al	Ga	Ga	Y	2.061	0.912	Mg	Ba	Zr	Zr	Al	In	Sc	Y	2.506	1.070	Mg	Ca	Sr	Cd	Si	Ge	Ge	Hf	2.908	1.063	Be	Mg	Mg	Ca	Si	Ti	Zr	Hf	4.242	0.673
Ba	Zn	Ge	Ti	Al	Al	Ga	In	2.061	0.748	Be	Cd	Si	Ge	Ga	Ga	Sc	Y	2.506	1.025	Mg	Zn	Hf	Hf	Ga	In	Sc	Y	2.908	1.013	Be	Mg	Mg	Ca	Si	Ge	Zr	Hf	4.273	0.634
Sr	Zn	Si	Sn	Al	Al	Sc	Y	2.061	0.977	Ca	Sr	Si	Zr	Ga	In	Sc	Sc	2.506	1.162	Be	Be	Mg	Cd	Si	Sn	Zr	Hf	2.908	1.146	Be	Mg	Ca	Ca	Si	Ge	Zr	Hf	4.293	0.814
Mg	Ca	Si	Sn	Al	In	Sc	Sc	2.061	0.906	Sr	Ba	Ge	Ti	In	Sc	Sc	Y	2.506	0.984	Be	Ca	Ge	Ti	Ga	Sc	Sc	Y	2.908	0.961	Be	Mg	Ca	Ca	Si	Ge	Ti	Hf	4.342	0.776
Ba	Zn	Ge	Zr	Al	Al	Ga	Sc	2.061	1.084	Mg	Ca	Zn	Cd	Ge	Ge	Sn	Zr	2.506	1.048	Be	Ca	Si	Ge	Al	Sc	Sc	Y	2.909	0.941	Be	Mg	Ca	Ca	Si	Ge	Ti	Zr	4.353	0.638
Mg	Sr	Sn	Ti	Ga	In	Sc	Sc	2.061	1.015	Mg	Sr	Zr	Hf	Al	Ga	In	In	2.506	1.245	Mg	Ca	Ba	Zn	Sn	Sn	Zr	Hf	2.909	1.200	Be	Mg	Mg	Ca	Si	Ge	Ti	Hf	4.375	0.693
Sr	Ba	Zn	Cd	Ge	Ge	Ti	Hf	2.061	0.813	Ba	Zn	Ti	Zr	Al	Al	In	Sc	2.506	1.047	Be	Cd	Si	Si	Al	Ga	In	Sc	2.909	0.992	Be	Mg	Mg	Ca	Si	Ge	Ti	Zr	4.392	0.648

Table S4 (h): 8 types of cations

Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)										Eg (eV)										Band offset (eV)									
Ba	Cd	Ge	Sn	Al	Ga	In	Y	0.725	0.388	Ba	Zn	Si	Ti	Al	Ga	In	Y	1.940	0.458	Be	Sr	Zr	Hf	Ga	In	Sc	Y	2.393	1.008	Mg	Cd	Si	Zr	Al	In	Sc	Y	2.750	0.902																																								
Sr	Cd	Ge	Sn	Al	Ga	In	Y	0.794	0.320	Ca	Zn	Ge	Hf	Al	Ga	In	Sc	1.941	0.527	Ba	Zn	Zr	Hf	Al	Ga	In	Sc	2.395	1.031	Be	Sr	Zr	Hf	Al	Ga	In	Sc	2.750	0.949																																								
Ba	Zn	Ge	Sn	Al	Ga	In	Y	0.859	0.307	Ca	Ba	Ge	Hf	Al	In	Sc	Y	1.943	0.270	Sr	Ba	Zr	Hf	Al	Ga	In	Y	2.395	0.608	Be	Mg	Ca	Cd	Si	Ge	Sn	Zr	2.753	0.656																																								
Ba	Cd	Ge	Sn	Al	Ga	In	Sc	0.877	0.171	Mg	Ca	Sn	Hf	Ga	In	Sc	Y	1.943	0.411	Ca	Sr	Si	Zr	Al	In	Sc	Y	2.395	0.778	Be	Cd	Si	Hf	Al	In	Sc	Y	2.755	0.752																																								
Mg	Ba	Ge	Sn	Al	Ga	In	Y	0.899	0.150	Ba	Zn	Si	Zr	Ga	In	Sc	Y	1.945	0.560	Sr	Ba	Si	Ti	Al	Ga	In	Sc	2.396	0.880	Mg	Cd	Zr	Hf	Al	In	Sc	Y	2.756	0.853																																								
Ba	Cd	Ge	Sn	Ga	In	Sc	Y	0.903	0.127	Sr	Ba	Zn	Cd	Ge	Sn	Ti	Hf	1.945	0.655	Mg	Ba	Zn	Cd	Si	Sn	Ti	Hf	2.397	1.170	Mg	Ca	Sr	Cd	Si	Ge	Zr	Hf	2.759	1.074																																								
Sr	Ba	Ge	Sn	Al	Ga	In	Y	0.926	0.364	Be	Ba	Ge	Ti	Ga	In	Sc	Y	1.945	0.722	Be	Sr	Zn	Cd	Ge	Sn	Zr	Hf	2.398	1.193	Be	Mg	Ba	Cd	Ge	Sn	Ti	Zr	2.761	1.120																																								
Be	Ba	Ge	Sn	Al	Ga	In	Sc	0.930	0.346	Ca	Sr	Sn	Zr	Al	Ga	In	Sc	Y	1.951	0.510	Be	Sr	Si	Zr	Al	Ga	In	Y	2.399	0.813	Mg	Sr	Zr	Hf	Al	Ga	In	Sc	Y	2.761	0.856																																						
Ca	Ba	Ge	Sn	Al	Ga	In	Y	0.937	0.323	Ca	Ba	Zn	Cd	Si	Sn	Zr	Hf	1.952	0.641	Ca	Cd	Si	Hf	Al	Ga	In	Sc	Y	2.402	0.976	Be	Cd	Zr	Hf	Al	In	Sc	Y	2.763	0.945																																							
Sr	Zn	Ge	Sn	Al	Ga	In	Y	0.945	0.305	Be	Ba	Ba	Zr	Al	Ga	In	Sc	Y	1.952	0.785	Be	Cd	Si	Sn	Al	Ga	In	Y	2.402	1.072	Be	Sr	Ti	Zr	Al	Ga	In	Sc	Y	2.763	1.040																																						
Sr	Cd	Ge	Sn	Al	Ga	In	Sc	0.949	0.433	Sr	Ba	Ge	Zr	Al	Ga	In	Sc	Y	1.952	0.335	Ba	Cd	Zr	Hf	Al	Ga	In	Sc	Y	2.402	0.768	Zn	Cd	Zr	Hf	Al	Ga	In	Sc	Y	2.764	0.675																																					
Mg	Ba	Ge	Sn	Al	Ga	In	Sc	0.958	0.414	Cd	Ba	Zn	Cd	Si	Sn	Ti	Zr	1.953	0.430	Ca	Ba	Zr	Hf	Ga	In	Sc	Y	2.403	0.825	Mg	Ca	Zr	Hf	Al	Ga	In	Sc	Y	2.764	0.745																																							
Be	Ba	Ge	Sn	Al	Ga	In	Y	0.969	0.382	Ba	Zn	Si	Hf	Al	In	Sc	Y	1.954	0.338	Ca	Cd	Zr	Hf	Al	Ga	In	Y	2.403	0.589	Be	Zn	Ge	Ti	Ga	In	Sc	Y	2.765	0.551																																								
Ca	Sr	Ge	Sn	Al	Ga	In	Y	0.973	0.348	Be	Ca	Si	Sn	Al	Ga	In	Sc	1.954	0.444	Mg	Sr	Si	Hf	Al	Ga	In	Sc	Y	2.404	0.735	Be	Mg	Ba	Cd	Al	Ga	In	Sc	Y	2.765	0.621																																						
Sr	Cd	Ge	Sn	Ga	In	Sc	Y	0.980	0.384	Ca	Sr	Ge	Hf	Al	Ga	In	Sc	1.955	0.516	Sr	Zn	Zr	Hf	Ga	In	Sc	Y	2.404	0.751	Be	Ca	Ba	Cd	Si	Ge	Ti	Hf	2.767	0.640																																								
Mg	Sr	Ge	Sn	Al	Ga	In	Y	0.991	0.526	Ca	Sr	Ge	Ti	Al	Ga	In	Y	1.956	0.425	Be	Ba	Zn	Cd	Si	Sn	Zr	Hf	2.406	0.803	Mg	Ca	Si	Zr	Al	Ga	In	Sc	Y	2.768	0.723																																							
Ba	Zn	Ge	Sn	Ga	In	Sc	Y	1.000	0.456	Ca	Cd	Si	Ge	Al	In	Sc	Y	1.959	0.526	Sr	Cd	Ti	Hf	Al	Ga	In	Sc	Y	2.406	0.870	Be	Ca	Si	Ti	Al	Ga	In	Y	2.768	0.797																																							
Ca	Cd	Ge	Sn	Al	Ga	In	Y	1.002	0.443	Mg	Sr	Ge	Hf	Ga	In	Sc	Y	1.959	0.513	Be	Ba	Zr	Hf	Al	In	Sc	Y	2.406	0.725	Zn	Cd	Si	Zr	Al	Ga	In	Sc	Y	2.769	0.652																																							
Ba	Cd	Ge	Sn	Al	In	Sc	Y	1.032	0.307	Mg	Ba	Ge	Ti	Al	Ga	In	Y	1.960	0.596	Mg	Ba	Zn	Cd	Si	Sn	Ti	Zr	2.407	0.854	Be	Mg	Ge	Zr	Al	Ga	In	Y	2.769	0.706																																								
Ba	Zn	Ge	Sn	Al	Ga	In	Sc	1.046	0.286	Mg	Sr	Ge	Zr	Al	Ga	In	Y	1.960	0.636	Zn	Cd	Ge	Ti	Al	In	Sc	Y	2.407	0.835	Be	Ca	Zn	Cd	Si	Sn	Ti	Hf	2.769	0.691																																								
Be	Sr	Ge	Sn	Ga	In	Sc	Y	1.049	0.258	Sr	Cd	Si	Hf	Ga	In	Sc	Y	1.960	0.447	Ca	Sr	Si	Ti	Ga	In	Sc	Y	2.410	0.816	Be	Cd	Ti	Zr	Ga	In	Sc	Y	2.769	0.739																																								
Mg	Sr	Ge	Sn	Ga	In	Sc	Y	1.051	0.490	Sr	Ba	Zn	Cd	Ge	Sn	Ti	Zr	1.960	0.548	Ca	Sr	Si	Zr	Al	Ga	In	Sc	2.412	0.885	Be	Mg	Si	Ge	Al	Ga	In	Y	2.770	0.813																																								
Ba	Cd	Si	Sn	Al	Ga	In	Y	1.058	0.471	Mg	Ba	Ba	Zn	Zr	Al	Ga	In	Sc	1.960	0.546	Be	Cd	Sn	Ti	Al	Ga	In	Sc	2.412	0.753	Be	Ca	Ba	Cd	Si	Ge	Ti	Zr	2.771	0.675																																							
Mg	Ba	Ge	Sn	Al	Ga	In	Sc	1.059	0.443	Sr	Cd	Si	Ti	Al	Ga	In	Y	1.961	0.626	Be	Ca	Ge	Ti	Al	Ga	In	Y	2.412	0.879	Be	Mg	Zn	Cd	Si	Ge	Sn	Hf	2.772	0.726																																								
Ca	Ba	Ge	Sn	Ga	In	Sc	Y	1.073	0.428	Ca	Ba	Ge	Zr	Ga	In	Sc	Y	1.963	0.661	Mg	Zn	Sn	Hf	Al	Ga	In	Sc	Y	2.412	0.855	Be	Zn	Si	Ge	Al	Ga	In	Sc	2.773	0.707																																							
Sr	Ba	Ge	Sn	Al	Ga	In	Sc	1.074	0.560	Mg	Sr	Si	Ge	Al	In	Sc	Y	1.963	0.791	Mg	Cd	Ge	Zr	Al	In	Sc	Y	2.412	1.333	Be	Zn	Ge	Zr	Al	Ga	In	Sc	2.777	1.225																																								
Sr	Ba	Ge	Sn	Ga	In	Sc	Y	1.088	0.541	Mg	Ba	Ge	Hf	Al	In	Sc	Y	1.963	0.864	Be	Sr	Ti	Zr	Al	Ga	In	Sc	Y	2.412	1.362	Zn	Cd	Ti	Hf	Al	Ga	In	Sc	2.778	1.277																																							
Be	Sr	Ge	Sn	Al	Ga	In	Y	1.089	0.503	Ba	Zn	Ge	Ti	Al	Ga	In	Sc	1.963	0.667	Be	Ca	Ba	Cd	Ge	Sn	Zr	Hf	2.414	0.990	Be	Cd	Si	Hf	Al	Ga	In	Sc	Y	2.779	1.012																																							
Ca	Ba	Ge	Sn	Al	Ga	In	Sc	1.093	0.472	Mg	Sr	Sn	Ti	Al	Ga	In	Sc	1.964	0.787	Sr	Ba	Ti	Zr	Al	In	Sc	Y	2.414	1.141	Mg	Ba	Zn	Cd	Ge	Ti	Zr	Hf	2.780	1.090																																								
Sr	Zn	Ge	Sn	Ga	In	Sc	Y	1.094	0.511	Zn	Cd	Sn	Hf	Al	Ga	In	Sc	1.964	0.924	Zn	Cd	Ge	Zr	Al	Ga	In	Sc	Y	2.415	1.229	Ca	Ba	Zn	Cd	Si	Ge	Ti	Hf	2.781	1.183																																							
Ba	Cd	Sn	Hf	Al	Ga	In	Y	1.101	0.102	Sr	Zn	Ge	Ti	Al	In	Sc	Y	1.966	0.446	Ca	Sr	Ti	Hf	Ga	In	Sc	Y	2.416	0.904	Be	Mg	Si	Sn	Al	Ga	In	Sc	Y	2.781	0.800																																							
Ca	Sr	Ge	Sn	Ga	In	Sc	Y	1.108	0.056	Ca	Zn	Si	Sn	Al	Ga	In	Sc	Y	1.967	0.547	Sr	Ba	Si	Hf	Al	Ga	In	Sc	Y	2.417	0.968	Be	Ca	Zn	Cd	Si	Sn	Ti	Zr	2.783	0.877																																						
Sr	Cd	Ge	Sn	Al	Ga	In	Sc	1.114	0.050	Be	Sr	Sn	Ti	Al	Ga	In	Sc	Y	1.967	0.470	Mg	Ca	Sn	Ti	Al	Ga	In	Sc	Y	2.417	0.738	Be	Cd	Ti	Zr	Al	Ga	In	Y	2.784	0.680																																						
Be	Ba	Ge	Sn	Al	Ga	In	Sc	1.117	-0.089	Be	Sr	Si	Ge	Al	In	Sc	Y	1.968	0.564	Sr	Ba	Si	Ti	Al	In	Sc	Y	2.417	0.872	Be	Mg	Sn	Zr	Al	Ga	In	Sc	Y	2.785	0.739																																							
Sr	Cd	Si	Sn	Al	Ga	In	Y	1.130	-0.102	Be	Sr	Ge	Hf	Al	Ga	In	Y	1.969	0.629	Be	Ca	Ge	Hf	Al	Ga	In	Sc	2.419																																																			

Ca	Ba	Ge	Sn	Al	Ga	Sc	Y	1.442	0.736	Be	Cd	Sn	Hf	Al	Ga	In	Y	2.055	1.122	Ca	Sr	Ba	Cd	Si	Ge	Zr	Hf	2.476	1.213	Mg	Cd	Ti	Zr	Al	In	Sc	Y	2.876	1.117	
Ba	Zn	Sn	Zr	Al	Ga	In	Sc	1.446	0.720	Be	Sr	Sn	Zr	Al	Ga	Sc	Y	2.056	1.046	Ca	Cd	Ti	Hf	Al	Ga	In	Sc	2.476	1.088	Be	Mg	Ca	Cd	Si	Sn	Zr	Hf	2.876	1.059	
Ba	Cd	Sn	Zr	Al	In	Sc	Y	1.447	0.679	Mg	Sr	Ge	Hf	Al	Ga	In	Sc	2.059	1.138	Ca	Sr	Ti	Zr	Al	Ga	In	Sc	2.477	1.195	Ca	Sr	Ba	Zn	Si	Ge	Sn	Hf	2.878	1.153	
Ba	Cd	Ge	Hf	Al	Ga	In	Sc	1.448	0.582	Ca	Ba	Sn	Ti	Al	Ga	Sc	Y	2.060	1.144	Ca	Ba	Ti	Zr	Al	In	Sc	Y	2.477	1.157	Be	Zn	Ge	Zr	Al	Ga	Sc	Y	2.879	1.054	
Be	Ba	Si	Sn	Al	Ga	In	Sc	1.450	0.791	Be	Ba	Sn	Zr	Al	Ga	In	Sc	2.060	1.048	Ca	Sr	Ba	Cd	Si	Ge	Sn	Zr	2.478	1.160	Be	Mg	Ge	Ti	Ga	In	Sc	Y	2.879	1.088	
Sr	Cd	Si	Hf	Al	Ga	In	Y	1.453	0.775	Mg	Zn	Sn	Hf	Al	Ga	In	Y	2.061	1.132	Mg	Cd	Sn	Ti	Al	Ga	Sc	Y	2.478	1.220	Be	Zn	Zr	Hf	Ga	In	Sc	Y	2.881	1.131	
Sr	Cd	Sn	Hf	Al	Ga	In	Sc	1.455	0.732	Be	Sr	Ge	Ti	Ga	In	Sc	Y	2.062	1.069	Mg	Zn	Ge	Hf	Al	Ga	In	Sc	2.478	1.108	Be	Mg	Ba	Cd	Si	Ge	Zr	Hf	2.881	1.082	
Be	Ba	Si	Sn	Al	In	Sc	Y	1.455	0.628	Mg	Cd	Si	Ge	Al	Ga	In	Y	2.062	1.159	Mg	Cd	Ge	Hf	Al	Ga	Sc	Y	2.478	1.212	Be	Mg	Ba	Cd	Si	Ti	Zr	Hf	2.881	1.174	
Sr	Cd	Ge	Zr	Al	Ga	In	Y	1.455	0.624	Mg	Zn	Si	Hf	Al	Ga	Sc	Y	2.065	1.160	Sr	Zn	Ti	Hf	Al	Ga	Sc	Y	2.479	1.170	Mg	Zn	Zr	Hf	Al	Ga	In	Y	2.881	1.070	
Ba	Cd	Sn	Hf	Al	Ga	Sc	Y	1.455	0.320	Be	Ba	Zn	Ti	Ga	In	Sc	Y	2.065	0.856	Be	Ca	Sn	Ti	Al	Ga	Sc	Y	2.479	0.946	Be	Sr	Zn	Cd	Sn	Ti	Zr	Hf	2.883	0.832	
Ca	Cd	Si	Sn	Ga	In	Sc	Y	1.460	0.292	Sr	Zn	Si	Zr	Ga	In	Sc	Y	2.066	0.905	Mg	Sr	Zn	Cd	Si	Sn	Ti	Hf	2.480	0.969	Be	Mg	Cd	Cd	Ge	Ti	Zr	Hf	2.884	0.834	
Sr	Zn	Si	Sn	Al	Ga	In	Sc	1.460	0.288	Be	Ca	Sn	Hf	Al	In	Sc	Y	2.068	0.819	Be	Cd	Ge	Ti	Al	Ga	In	Y	2.480	0.850	Mg	Cd	Si	Ti	Al	In	Sc	Y	2.884	0.796	
Sr	Zn	Ge	Hf	Al	Ga	In	Y	1.465	0.263	Ba	Zn	Ti	Hf	Al	Ga	In	Y	2.068	0.922	Be	Mg	Sn	Hf	Al	Ga	In	Y	2.481	0.971	Mg	Ca	Si	Ti	Al	Ga	In	Sc	2.885	0.908	
Ba	Cd	Ge	Ti	Al	Ga	In	Sc	1.467	0.253	Zn	Cd	Si	Sn	Al	Ga	Sc	Y	2.070	0.943	Mg	Sr	Ti	Zr	Ga	In	Sc	Y	2.482	0.953	Be	Cd	Zr	Hf	Al	Ga	In	Sc	2.889	0.823	
Mg	Ba	Si	Sn	Al	In	Sc	Y	1.470	0.289	Ca	Ba	Zn	Cd	Ge	Sn	Ti	Hf	2.070	0.866	Be	Ca	Ge	Zr	Al	Ga	In	Sc	2.483	0.953	Mg	Ca	Sr	Cd	Si	Ge	Ti	Hf	2.890	0.843	
Ba	Zn	Sn	Zr	Ga	In	Sc	Y	1.475	0.564	Mg	Ca	Ba	Sn	Hf	Al	Ga	In	Sc	2.071	0.917	Ca	Zn	Ti	Zr	Al	Ga	In	Sc	2.485	0.977	Mg	Cd	Ti	Zr	Al	Ga	In	Sc	2.890	0.846
Ca	Sr	Ge	Sn	Al	Ga	Sc	Y	1.478	0.555	Be	Ca	Sn	Zr	Al	Ga	In	Y	2.072	0.843	Be	Sr	Ti	Hf	Al	In	Sc	Y	2.485	0.871	Mg	Ca	Sr	Zn	Ge	Sn	Zr	Hf	2.890	0.817	
Ca	Zn	Ge	Sn	Al	In	Sc	Y	1.480	0.596	Be	Ba	Sn	Ti	Al	Ga	Sc	Y	2.073	0.943	Mg	Ba	Si	Ti	Al	In	Sc	Y	2.486	0.988	Mg	Ca	Sr	Cd	Ge	Ti	Zr	Hf	2.891	0.927	
Mg	Ca	Ge	Sn	Al	Ga	In	Sc	1.480	0.544	Mg	Cd	Sn	Hf	Ga	In	Sc	Y	2.074	0.960	Sr	Ba	Si	Zr	Al	Ga	Sc	Y	2.486	0.966	Be	Zn	Ge	Ti	Al	In	Sc	Y	2.893	0.837	
Sr	Cd	Sn	Hf	Al	In	Sc	Y	1.480	0.647	Sr	Zn	Si	Hf	Al	In	Sc	Y	2.076	0.897	Mg	Zn	Sn	Zr	Al	Ga	Sc	Y	2.488	0.984	Ca	Sr	Ba	Zn	Si	Ge	Sn	Zr	2.893	0.878	
Sr	Ba	Sn	Hf	Al	Ga	In	Y	1.481	0.637	Be	Cd	Ge	Sn	Al	Ga	Sc	Y	2.077	0.925	Mg	Ca	Zn	Cd	Si	Ge	Sn	Hf	2.488	0.983	Mg	Ca	Si	Zr	Al	Ga	Sc	Y	2.894	0.857	
Sr	Ba	Sn	Hf	Al	Ga	In	Sc	1.483	0.668	Ca	Zn	Ge	Zr	Al	In	Sc	Y	2.078	0.862	Be	Ca	Sr	Cd	Ge	Sn	Zr	Hf	2.488	0.891	Be	Cd	Ti	Hf	Al	Ga	In	Sc	2.895	0.834	
Ca	Sr	Si	Sn	Al	Ga	In	Sc	1.484	0.602	Mg	Ca	Sn	Zr	Al	In	Sc	Y	2.078	0.952	Zn	Cd	Ti	Zr	Al	Ga	In	Y	2.489	1.003	Be	Mg	Sr	Zn	Si	Ge	Sn	Hf	2.895	0.945	
Ba	Cd	Si	Ge	Ga	In	Sc	Y	1.488	0.660	Be	Cd	Si	Sn	Al	Ga	In	Sc	2.078	0.970	Be	Sr	Si	Hf	Al	Ga	In	Sc	2.489	0.988	Be	Ca	Ba	Zn	Si	Ge	Sn	Hf	2.895	0.863	
Ca	Cd	Ge	Sn	Al	Ga	Sc	Y	1.495	0.742	Sr	Cd	Ti	Hf	Al	Ga	In	Y	2.079	1.217	Be	Zn	Sn	Hf	Al	Ga	In	Sc	2.490	0.650	Mg	Ca	Zn	Cd	Sn	Ti	Zr	Hf	2.896	1.015	
Ca	Cd	Sn	Zr	Al	Ga	In	Y	1.497	0.689	Ca	Ba	Zn	Cd	Si	Sn	Ti	Hf	2.081	1.241	Ca	Ba	Si	Hf	Al	Ga	In	Sc	2.490	0.693	Mg	Ca	Cd	Cd	Si	Ge	Ti	Zr	2.900	1.092	
Ba	Zn	Si	Ge	Al	Ga	In	Y	1.498	0.678	Zn	Cd	Ge	Hf	Al	Ga	In	Sc	2.081	0.794	Mg	Ba	Ti	Zr	Al	In	Sc	Y	2.490	0.403	Mg	Zn	Ti	Hf	Ga	In	Sc	Y	2.901	0.860	
Ba	Cd	Ge	Ti	Al	Ga	In	Y	1.498	0.676	Sr	Ba	Ge	Ti	Al	In	Sc	Y	2.082	0.968	Sr	Zn	Zr	Hf	Al	Ga	In	Sc	2.491	0.517	Mg	Zn	Ti	Zr	Al	Ga	In	Y	2.901	0.945	
Ca	Cd	Si	Sn	Al	Ga	In	Sc	1.499	0.657	Ca	Cd	Si	Zr	Al	Ga	In	Y	2.083	1.093	Mg	Ca	Si	Hf	Ga	In	Sc	Y	2.491	0.644	Be	Zn	Si	Zr	Al	Ga	In	Y	2.902	1.055	
Sr	Zn	Sn	Ti	Al	Ga	In	Sc	1.507	0.654	Mg	Cd	Ge	Hf	Al	Ga	In	Y	2.083	1.390	Mg	Sr	Zn	Cd	Si	Sn	Ti	Zr	2.492	0.839	Mg	Zn	Si	Zr	Al	In	Sc	Y	2.903	1.184	
Ba	Cd	Si	Sn	Al	Ga	Sc	Y	1.510	0.829	Ca	Ba	Zn	Cd	Ge	Sn	Ti	Zr	2.085	1.415	Sr	Cd	Zr	Hf	Al	Ga	Sc	Y	2.493	0.880	Be	Ca	Ba	Zn	Si	Ge	Sn	Zr	2.904	1.260	
Mg	Sr	Ge	Sn	Al	Ga	Sc	Y	1.510	0.811	Zn	Cd	Sn	Ti	Ga	In	Sc	Y	2.085	1.012	Mg	Zn	Ge	Zr	Ga	In	Sc	Y	2.494	0.827	Be	Zn	Si	Zr	Ga	In	Sc	Y	2.905	1.054	
Ba	Zn	Zr	Zr	Al	In	Sc	Y	1.511	0.805	Zn	Cd	Sn	Hf	Al	Ga	Sc	Y	2.087	1.180	Mg	Ba	Ti	Zr	Al	Ga	In	Y	2.494	0.732	Be	Zn	Cd	Cd	Si	Ge	Sn	Ti	2.906	1.132	
Sr	Ba	Si	Sn	Al	In	Sc	Y	1.511	0.670	Ca	Sr	Ge	Ti	Ga	In	Sc	Y	2.088	1.300	Ca	Ba	Zn	Cd	Ge	Ti	Zr	Hf	2.496	0.854	Be	Ca	Sr	Zn	Si	Sn	Zr	Hf	2.909	1.237	
Mg	Sr	Si	Sn	Al	Ga	In	Sc	1.511	0.964	Mg	Ba	Sn	Ti	Al	Ga	Sc	Y	2.088	1.006	Ca	Cd	Ti	Zr	Ga	In	Sc	Y	2.497	0.467	Be	Ca	Zn	Cd	Si	Ge	Zr	Hf	2.909	0.793	
Ca	Zn	Si	Sn	Al	Ga	In	Y	1.512	0.947	Ca	Ba	Ge	Ti	Al	Ga	In	Sc	2.090	1.065	Be	Sr	Zn	Cd	Si	Sn	Zr	Hf	2.497	0.533	Mg	Zn	Si	Zr	Al	Ga	In	Sc	2.910	0.890	
Ba	Zn	Sn	Hf	Al	Ga	In	Sc	1.515	0.931	Sr	Zn	Ge	Ti	Al	Ga	Sc	Y	2.091	0.817	Be	Ca	Si	Hf	Ga	In	Sc	Y	2.498	0.371	Be	Cd	Ti	Hf	Ga	In	Sc	Y	2.912	0.738	
Ba	Cd	Ge	Zr	Al	Ga	In	Sc	1.517	0.779	Ca	Ba	Zn	Cd	Si	Ge	Zr	Hf	2.094	0.965	Ca	Sr	Zr	Hf	Al	In	Sc	Y	2.499	0.450	Mg	Ca	Sr	Cd	Si	Ti	Zr	Hf	2.913	0.800	
Sr	Cd	Sn	Zr	Ga	In	Sc	Y	1.518	0.881	Ca	Ba	Zn	Cd	Si	Sn	Ti	Zr	2.095	1.014	Mg	Ca	Ba	Cd	Si	Sn	Zr	Hf	2.499	0.497	Ca	Sr	Ba	Zn	Si	Ge	Zr	Hf	2.913	0.832	
Mg	Cd	Ge	Sn	Ga	In	Sc	Y	1.518	0.440	Sr	Ba	Si	Hf	Al	Ga	In	Y	2.095	1.035	Be	Mg	Ge	Sn	Al	Ga	Sc	Y	2.499	0.534	Mg	Cd	Si	Zr	Al	Ga	Sc	Y	2.914	0.839	
Mg	Ca	Ge	Sn	Al	In	Sc	Y	1.518	0.401	Ca	Sr	Sn	Ti	Al	Ga	Sc	Y	2.096	1.106	Mg	Ca	Ba	Cd	Ge	Sn	Zr	Hf	2.499	0.605	Mg	Zn	Si	Ti	Ga	In	Sc	Y	2.914	0.939	
Ba	Cd	Ge	Hf	Ga	In	Sc	Y	1.521	0.395	Sr	Cd	Si	Zr	Al	In	Sc	Y	2.097	0.958	Be	Sr	Zr	Hf	Al	In	Sc	Y	2.502	0.505	Mg	Zn	Ge	Ti	Al	Ga	Sc	Y	2.918	0.826	
Sr	Zn	Sn	Hf	Ga	In	Sc	Y	1.522	0.338	Ca	Cd	Ge	Zr	Al	Ga	Sc	Y	2.100	1.088	Be	Ba	Ti	Zr	Al	Ga	In	Y	2.502	0.564	Be	Mg	Sr	Zn	Si	Ge	Sn	Zr	2.918	0.874	
Ca	Ba	Si	Sn	Al	In	Sc	Y	1.525	0.325	Mg	Ca	Sn	Ti	Ga	In	Sc	Y	2.100	1.103	Be	Zn	Sn	Zr	Al	In	Sc	Y	2.502	0.577	Mg	Zn	Zr	Hf	Ga	In	Sc	Y	2.920	0.872	
Ba	Cd	Sn	Zr	Al	Ga	Sc	Y	1.526	0.295	Ca	Zn	Si	Ge	Al	In	Sc	Y	2.100	1.047	Ca	Sr	Zn	Cd	Sn	Ti	Zr	Hf	2.503	0.553	Zn	Cd	Si	Ti	Al	Ga	Sc	Y	2.922	0.855	
Ba	Cd	Sn	Ti	Ga	In	Sc																																		

Ba	Cd	Ge	Hf	Al	Ga	Sc	Y	1.659	0.706	Zn	Cd	Si	Ge	Al	In	Sc	Y	2.175	1.416	Zn	Cd	Zr	Hf	Ga	In	Sc	Y	2.552	0.923	Mg	Ca	Sr	Zn	Si	Sn	Zr	Hf	2.999	1.218	
Mg	Sr	Sn	Hf	Al	Ga	In	Y	1.661	0.767	Mg	Ca	Ge	Zr	Al	Ga	In	Y	2.175	1.525	Mg	Cd	Ge	Zr	Al	Ga	In	Sc	2.552	1.024	Be	Ca	Sr	Zn	Si	Ge	Sn	Zr	3.000	1.303	
Ba	Cd	Ge	Ti	Al	Ga	In	Sc	1.662	0.758	Mg	Ba	Zn	Cd	Ge	Sn	Zr	Hf	2.177	1.216	Mg	Cd	Ge	Zr	Al	Ga	In	Sc	2.553	0.701	Mg	Ca	Sr	Zn	Ge	Sn	Zr	Hf	3.000	0.926	
Mg	Zn	Ge	Sn	Al	Ga	In	Y	1.663	0.707	Mg	Sr	Ti	Al	Ga	In	Sc	Y	2.178	1.279	Be	Sr	Ti	Hf	Al	Ga	In	Y	2.554	0.748	Be	Mg	Ca	Cd	Ge	Sn	Ti	Zr	3.003	1.008	
Be	Ba	Sn	Zr	Ga	In	Sc	Y	1.664	0.698	Ca	Cd	Si	Hf	Al	Ga	In	Sc	2.179	1.035	Be	Ca	Ba	Cd	Si	Sn	Ti	Hf	2.554	0.547	Be	Cd	Si	Zr	Al	Ga	Sc	Y	3.004	0.822	
Ba	Zn	Sn	Ti	Al	In	Sc	Y	1.666	0.674	Mg	Ca	Sn	Hf	Al	Ga	In	Sc	2.181	1.176	Mg	Ca	Si	Zr	Ge	Al	In	Sc	Y	2.555	0.621	Be	Zn	Ti	Zr	Al	Ga	In	Y	3.004	0.878
Ca	Cd	Sn	Zr	Al	In	In	Sc	1.667	0.660	Ca	Zn	Si	Zr	Al	Ga	In	Y	2.185	1.213	Mg	Zn	Si	Zr	Ge	Al	In	Sc	Y	2.557	0.645	Be	Sr	Ba	Zn	Sn	Ti	Zr	Hf	3.007	0.889
Ca	Cd	Si	Ge	Al	Ga	In	Y	1.670	0.623	Mg	Zn	Si	Sn	Al	Ga	In	Sc	2.185	1.224	Be	Ca	Si	Zr	Ga	In	Sc	Y	2.557	0.749	Be	Mg	Si	Zr	Ga	In	In	Sc	Y	3.010	0.963
Ba	Cd	Si	Hf	Al	Ga	In	Y	1.672	0.910	Sr	Zn	Si	Ti	Ga	In	Sc	Y	2.189	1.299	Cd	Ca	Sr	Cd	Ge	Sn	Zr	Hf	2.557	0.802	Be	Zn	Si	Zr	Al	Ga	In	Sc	Y	3.013	1.049
Sr	Zn	Si	Ge	In	Sc	Y	1.673	0.897	Be	Ca	Si	Sn	Al	Ga	Sc	Y	2.188	1.155	Be	Ca	Ba	Cd	Si	Sn	Ti	Zr	2.557	0.668	Be	Mg	Ge	Zr	Al	Ga	In	Sc	Y	3.017	0.905	
Sr	Cd	Ge	Hf	Al	In	Sc	Y	1.673	0.867	Ca	Ba	Ge	Al	Ga	Sc	Y	2.186	1.279	Be	Mg	Sr	Cd	Si	Ge	Sn	Zr	2.557	0.721	Mg	Ca	Ti	Zr	Al	Ga	Sc	Y	3.017	0.947		
Sr	Zn	Ge	Hf	Al	In	Sc	Y	1.674	0.699	Be	Sr	Sn	Ti	Al	Ga	Sc	Y	2.186	1.284	Ca	Ba	Si	Zr	Al	Ga	Sc	Y	2.559	0.711	Be	Ca	Ti	Zr	Al	Ga	Sc	Y	3.018	0.925	
Ca	Ba	Sn	Ti	Al	Ga	In	Y	1.677	1.057	Ca	Zn	Ge	Ti	Al	Ga	In	Sc	2.186	1.233	Zn	Cd	Ti	Hf	Ga	In	Sc	Y	2.559	0.765	Be	Mg	Ba	Zn	Ge	Sn	Zr	Hf	3.018	0.977	
Ca	Ba	Sn	Hf	Ga	In	Sc	Y	1.680	1.044	Ca	Zn	Ge	Zr	Al	Ga	Sc	Y	2.186	1.309	Be	Ba	Sn	Zr	Al	Ga	In	Sc	2.559	0.818	Be	Zn	Si	Ti	Zr	Ga	In	Sc	Y	3.019	1.063
Ba	Zn	Ge	Zr	Al	In	Sc	Y	1.681	1.010	Be	Ca	Ge	Hf	Ga	In	Sc	Y	2.187	1.179	Mg	Ca	Ba	Cd	Si	Ge	Sn	Hf	2.560	0.693	Be	Mg	Zn	Cd	Si	Sn	Ti	Zr	3.019	0.925	
Be	Ba	Si	Ge	Al	Ga	In	Y	1.681	0.835	Ca	Sr	Si	Hf	Al	Ga	In	Y	2.187	1.300	Be	Zn	Sn	Zr	Al	Ga	In	Sc	Y	2.561	0.743	Be	Sr	Ba	Zn	Ge	Ti	Zr	Hf	3.020	0.965
Ca	Sr	Si	Ge	Al	Ga	In	Y	1.682	0.914	Mg	Cd	Sn	Zr	Al	In	Sc	Y	2.188	1.301	Mg	Ca	Sr	Cd	Si	Sn	Zr	Hf	2.561	0.729	Be	Mg	Ge	Zr	Al	Ga	Sc	Y	3.023	0.938	
Ca	Cd	Sn	Hf	Ga	In	Sc	Y	1.683	0.327	Be	Ca	Sn	Hf	Al	Ga	In	Sc	2.188	1.366	Mg	Cd	Ge	Ti	Al	In	Sc	Y	2.561	0.850	Be	Mg	Zr	Hf	Ga	In	Sc	Y	3.029	1.096	
Zn	Cd	Sn	Hf	Al	Ga	In	Y	1.685	0.296	Be	Ba	Si	Zr	Ga	In	Sc	Y	2.191	1.421	Mg	Ca	Zn	Cd	Ge	Sn	Ti	Zr	2.561	0.887	Be	Ca	Zr	Hf	Al	Ga	In	Sc	3.029	1.165	
Sr	Cd	Sn	Ti	Al	In	Sc	Y	1.685	0.291	Sr	Ba	Si	Hf	Ga	In	Sc	Y	2.192	1.203	Be	Ba	Zn	Cd	Si	Sn	Ti	Hf	2.562	0.694	Be	Zn	Si	Hf	Al	Ga	In	Sc	3.033	0.971	
Ba	Cd	Sn	Ti	Al	Ga	Sc	Y	1.689	0.326	Ba	Cd	Ti	Hf	Al	In	Sc	Y	2.192	1.327	Be	Sr	Zn	Cd	Ge	Sn	Ti	Hf	2.562	0.752	Be	Mg	Ge	Ti	Al	In	Sc	Y	3.035	1.018	
Sr	Ba	Sn	Zr	Al	Ga	In	Sc	1.689	0.316	Ca	Cd	Si	Hf	Ga	In	Sc	Y	2.192	1.357	Mg	Sr	Zn	Cd	Si	Ge	Zr	Hf	2.563	0.764	Be	Mg	Sr	Cd	Si	Ge	Ti	Hf	3.035	1.019	
Sr	Cd	Ge	Zr	Ga	In	Sc	Y	1.691	0.286	Sr	Zn	Si	Hf	Al	Ga	Sc	Y	2.192	1.349	Sr	Ba	Zr	Hf	Al	Ga	Sc	Y	2.565	0.873	Be	Cd	Ti	Zr	Al	Ga	Sc	Y	3.036	1.103	
Ca	Ba	Sn	Hf	Al	Ga	In	Sc	1.692	0.592	Ba	Cd	Si	Zr	Ga	In	Sc	Y	2.193	1.415	Be	Ba	Si	Zr	Al	Ga	Sc	Y	2.565	0.916	Be	Ca	Sr	Zn	Ge	Sn	Ti	Hf	3.036	1.176	
Ca	Ba	Sn	Al	Ga	In	Sc	1.693	0.583	Ba	Zn	Ti	Hf	Ga	In	Sc	Y	2.193	1.295	Ca	Cd	Ti	Zr	Al	In	Sc	Y	2.567	0.786	Be	Mg	Si	Hf	Al	Ga	In	Y	3.037	1.022		
Zn	Cd	Si	Sn	Al	Ga	In	Sc	1.694	0.553	Ca	Sr	Si	Ge	Al	Ga	Sc	Y	2.194	1.402	Be	Ba	Zn	Cd	Si	Sn	Ti	Zr	2.567	0.825	Be	Ca	Ti	Zr	Al	Ga	In	Sc	3.037	1.054	
Sr	Zn	Ge	Ti	Al	Ga	In	Y	1.695	0.417	Sr	Cd	Zr	Hf	Al	Ga	In	Y	2.195	1.400	Mg	Ca	Si	Zr	Al	Ga	In	Y	2.568	0.803	Mg	Cd	Ti	Zr	Al	Ga	Sc	Y	3.039	1.024	
Be	Ba	Sn	Zr	Al	Ga	In	Y	1.696	0.720	Ba	Cd	Zr	Hf	Al	Ga	In	Y	2.200	1.354	Be	Sr	Zn	Cd	Ge	Sn	Ti	Zr	2.569	0.885	Mg	Ca	Zn	Cd	Si	Ti	Zr	Hf	3.042	1.112	
Mg	Cd	Ge	Sn	Al	In	Sc	Y	1.698	0.711	Zn	Cd	Ge	Hf	Al	In	Sc	Y	2.202	1.421	Be	Zn	Sn	Hf	Al	Ga	In	Sc	Y	2.570	0.928	Be	Ca	Sr	Zn	Ge	Sn	Ti	Zr	3.043	1.186
Ba	Cd	Ge	Hf	Al	Ga	Sc	Y	1.700	0.670	Ca	Cd	Si	Ti	Al	Ga	In	Y	2.208	1.315	Be	Zn	Ge	Hf	Ga	In	Sc	Y	2.571	0.808	Be	Mg	Ti	Hf	Ga	In	Sc	Y	3.044	1.037	
Ca	Ba	Sn	Hf	Al	Ga	In	Y	1.700	0.518	Be	Ba	Ge	Zr	Al	Ga	Sc	Y	2.208	1.419	Be	Sr	Ba	Cd	Cd	Sn	Ti	Zr	Hf	2.571	0.843	Be	Sr	Zn	Si	Ge	Sn	Ti	Zr	3.044	1.067
Ba	Sr	Si	Ge	In	Sc	Y	1.701	0.614	Ca	Ba	Zn	Cd	Si	Ge	Ti	Hf	2.210	1.413	Mg	Ca	Ba	Cd	Si	Ge	Sn	Zr	2.573	0.817	Be	Mg	Si	Ge	Al	Ga	In	Sc	3.045	1.033		
Ca	Cd	Ge	Zr	Al	Ga	In	Y	1.701	0.392	Mg	Ba	Si	Hf	Ga	In	Y	2.211	1.160	Mg	Sr	Ti	Zr	Al	Ga	In	Y	2.573	0.714	Mg	Zn	Ti	Zr	Al	In	Sc	Y	3.046	0.881		
Be	Ba	Sn	Hf	Al	In	Sc	Y	1.702	0.363	Be	Zn	Si	Sn	Al	Ga	In	Y	2.212	1.195	Be	Ca	Ge	Zr	Al	Ga	Sc	Y	2.574	0.720	Be	Ca	Sr	Zn	Si	Sn	Ti	Hf	3.047	0.915	
Ba	Cd	Ge	Ti	Ga	In	Sc	Y	1.703	0.358	Ca	Sr	Ge	Zr	Al	Ga	Sc	Y	2.213	1.072	Ca	Zn	Si	Ti	Al	Ga	In	Sc	Y	2.574	0.584	Be	Zn	Si	Ti	Al	Ga	In	Y	3.047	0.768
Sr	Ba	Sn	Zr	Ga	In	Sc	Y	1.704	0.405	Be	Cd	Sn	Hf	Al	Ga	In	Sc	2.213	1.188	Ca	Cd	Zr	Hf	Al	Ga	In	Sc	2.575	0.637	Be	Ca	Zn	Cd	Si	Ge	Ti	Hf	3.051	0.817	
Mg	Ba	Sn	Ti	Al	Ga	In	Y	1.706	0.394	Ba	Cd	Ti	Zr	Al	Ga	In	Sc	2.213	1.207	Ca	Cd	Zr	Hf	Al	In	Sc	Y	2.576	0.613	Be	Ca	Sr	Zn	Si	Sn	Ti	Zr	3.053	0.780	
Sr	Zn	Sn	Zr	Al	Ga	Sc	Y	1.707	0.359	Mg	Ca	Sn	Ti	Al	In	Sc	Y	2.213	1.166	Mg	Zn	Ge	Zr	Al	In	Sc	Y	2.577	0.727	Be	Zn	Ti	Zr	Al	In	Sc	Y	3.053	0.890	
Ca	Sr	Sn	Ti	Al	Ga	In	Y	1.708	0.663	Zn	Cd	Ge	Zr	Ga	In	Sc	Y	2.214	1.202	Sr	Zn	Zr	Hf	Al	Ga	Sc	Y	2.578	0.734	Be	Mg	Sr	Cd	Si	Ge	Ti	Zr	3.054	0.924	
Ca	Sr	Sn	Hf	Ga	In	Sc	Y	1.708	0.654	Be	Cd	Si	Ge	Ga	In	Sc	Y	2.216	1.092	Be	Zn	Ge	Zr	Al	Ga	In	Y	2.579	0.607	Mg	Zn	Ti	Hf	Al	Ga	In	Sc	3.054	0.783	
Mg	Ba	Sn	Zr	Ga	In	Sc	Y	1.710	0.618	Mg	Zn	Si	Sn	Al	In	Sc	Y	2.216	1.206	Mg	Sr	Si	Ti	Al	In	Sc	Y	2.580	0.656	Be	Ca	Ba	Zn	Si	Ge	Zr	Hf	3.055	0.830	
Sr	Ba	Sn	Zr	Al	In	Sc	Y	1.710	0.473	Mg	Cd	Si	Hf	Al	Ga	In	Y	2.219	1.221	Mg	Cd	Si	Ge	Al	Ga	In	Sc	Y	2.580	0.628	Mg	Ca	Sr	Zn	Si	Ge	Sn	Hf	3.056	0.789
Sr	Zn	Si	Sn	Al	Ga	Sc	Y	1.710	0.794	Mg	Cd	Si	Sn	Al	Ga	Sc	Y	2.219	1.182	Mg	Sr	Ti	Zr	Al	In	Sc	Y	2.581	0.757	Ca	Sr	Ba	Zn	Si	Ge	Ti	Hf	3.058	0.897	
Ca	Zn	Si	Sn	Al	Ga	In	Sc	1.711	0.785	Sr	Cd	Si	Zr	Al	Ga	Sc	Y	2.219	1.197	Ca	Sr	Ti	Hf	Al	Ga	In	Sc	2.582	0.741	Be	Sr	Ba	Zn	Si	Ti	Zr	Hf	3.058	0.906	
Mg	Cd	Si	Sn	Al	Ga	In	Y	1.712	0.738	Mg	Sr	Ge	Ti	Al	Ga	In	Sc	2.221	1.104	Zn	Cd	Ge	Ti	Al	Ga	In	Sc	Y	2.583	0.615	Mg	Ca	Si	Ti	Al	Ga	Sc	Y	3.059	0.762
Sr	Ba																																							

Mg	Sr	Sn	Hf	Al	In	Sc	Y	1.799	0.246	Zn	Cd	Si	Hf	Al	Ga	In	Y	2.287	1.023	Mg	Ca	Ti	Hf	Ga	In	Sc	Y	2.645	0.992	Be	Zn	Ti	Zr	Al	Ga	In	Sc	3.209	1.217		
Sr	Zn	Ge	Zr	Al	In	Sc	Y	1.802	0.536	Sr	Cd	Ti	Hf	Al	In	Sc	Y	2.288	1.020	Be	Ca	Si	Ti	Ga	In	Sc	Y	2.646	1.010	Be	Mg	Ge	Ti	Al	Ga	In	Sc	3.209	1.276		
Be	Sr	Si	Ge	Al	Ga	In	Y	1.802	0.524	Be	Ca	Si	Ge	Al	In	Sc	Y	2.288	0.750	Be	Ca	Sr	Cd	Si	Sn	Ti	Zr	2.646	0.731	Be	Mg	Sr	Zn	Ge	Sn	Ti	Zr	3.213	1.053		
Ca	Cd	Sn	Ti	Al	Ga	In	Sc	1.806	0.472	Mg	Cd	Ge	Ti	Al	Ga	In	Y	2.288	0.869	Mg	Ca	Ba	Cd	Si	Sn	Ti	Zr	2.646	0.877	Be	Mg	Ti	Zr	Al	In	Sc	Y	3.214	1.131		
Be	Sr	Sn	Hf	Al	In	Sc	Y	1.806	0.322	Mg	Sr	Cd	Zr	Hf	Al	In	Sc	Y	0.976	2.648	Be	Sr	Zn	Cd	Si	Ge	Sn	Hf	0.924	Be	Ca	Sr	Zn	Sn	Ti	Zr	Hf	3.220	1.217		
Sr	Cd	Ge	Ti	Ga	In	Sc	Y	1.806	0.610	Mg	Ca	Ge	Ti	Al	Ga	In	Y	2.292	0.741	Mg	Ca	Ba	Cd	Ge	Sn	Ti	Hf	2.648	0.658	Be	Mg	Zn	Cd	Si	Ge	Ti	Zr	Hf	3.222	0.844	
Mg	Ba	Si	Ge	Al	Ga	In	Sc	1.807	0.597	Sr	Zn	Zr	Hf	Al	Ga	In	Y	2.293	0.764	Be	Sr	Ba	Cd	Si	Ge	Ti	Zr	2.649	0.706	Be	Mg	Ca	Cd	Si	Ge	Ti	Hf	3.224	0.924		
Ca	Ba	Si	Ge	Al	Ga	In	Sc	1.807	0.534	Be	Zn	Sn	Hf	Al	Ga	In	Y	2.293	0.609	Mg	Ca	Si	Ti	Ga	In	Sc	Y	2.649	0.550	Be	Mg	Ca	Zn	Ge	Sn	Zr	Hf	3.229	0.758		
Ca	Cd	Sn	Hf	Al	Ga	In	Sc	1.807	0.365	Ca	Ba	Si	Zr	Ga	In	Sc	Y	2.293	0.701	Mg	Cd	Si	Zr	Ga	In	Sc	Y	2.650	0.684	Be	Mg	Ca	Zn	Si	Sn	Zr	Hf	3.230	0.821		
Ca	Sr	Si	Sn	Al	Ga	Sc	Y	1.813	0.424	Mg	Sr	Si	Hf	Ga	In	Sc	Y	2.295	0.736	Be	Zn	Ge	Hf	Al	In	Sc	Y	2.650	0.649	Be	Ca	Sr	Zn	Ge	Ti	Zr	Hf	3.232	0.833		
Sr	Ba	Zn	Cd	Ge	Sn	Zr	Hf	1.813	0.805	Mg	Sr	Si	Hf	Al	Ga	In	Y	2.295	0.832	Be	Mg	Ba	Cd	Si	Sn	Zr	Hf	2.651	0.719	Be	Mg	Ba	Zn	Si	Ge	Zr	Hf	3.232	0.894		
Ca	Zn	Ge	Zr	Al	Ga	In	Y	1.814	0.763	Ca	Ba	Si	Hf	Al	Ga	In	Sc	Y	2.296	0.862	Be	Sr	Ba	Cd	Si	Ge	Ti	Hf	2.651	0.775	Be	Zn	Ti	Zr	Al	Ga	Sc	Y	3.233	0.979	
Ca	Ba	Sn	Ti	Ga	In	Sc	Y	1.818	0.756	Be	Ba	Si	Zr	Al	Ga	In	Y	2.296	0.785	Be	Sr	Zn	Cd	Si	Sn	Ti	Hf	2.652	0.695	Be	Mg	Ca	Cd	Si	Ge	Ti	Zr	3.245	0.852		
Mg	Sr	Sn	Hf	Al	Ga	In	Sc	1.819	0.712	Be	Ba	Zr	Hf	Ga	In	Sc	Y	2.296	0.854	Be	Cd	Ge	Ti	Al	Ga	In	Sc	2.652	0.815	Be	Mg	Ti	Zr	Al	Ga	In	Y	3.250	0.902		
Sr	Ba	Zn	Cd	Si	Sn	Zr	Hf	1.819	0.697	Mg	Zn	Sn	Hf	Al	In	Sc	Y	2.297	0.858	Be	Ba	Zr	Hf	Al	Ga	In	Sc	2.654	0.745	Be	Mg	Ge	Ti	Al	Ga	Sc	Y	3.250	0.881		
Ca	Zn	Sn	Hf	Al	In	Sc	Y	1.823	0.646	Sr	Zn	Si	Ti	Al	In	Sc	Y	2.298	0.852	Mg	Cd	Ti	Hf	Al	Ga	In	Y	2.654	0.736	Be	Mg	Ba	Zn	Sn	Ti	Zr	Hf	3.252	0.910		
Ca	Cd	Si	Sn	Al	Ga	Sc	Y	1.824	0.953	Sr	Ba	Si	Zr	Al	In	Sc	Y	2.299	0.883	Mg	Ba	Ti	Hf	Al	Ga	Sc	Y	2.656	0.793	Mg	Zn	Si	Ti	Al	Ga	Sc	Y	3.253	0.995		
Be	Ba	Ge	Hf	Ga	In	Sc	Y	1.824	0.941	Sr	Zn	Ti	Hf	Ga	In	Sc	Y	2.300	0.817	Ca	Sr	Zr	Hf	Al	Ga	In	Sc	2.656	0.724	Be	Mg	Ba	Zn	Si	Ti	Zr	Hf	3.253	0.873		
Sr	Zn	Ge	Hf	Al	Ga	Sc	Y	1.825	0.889	Be	Ca	Ge	Hf	Al	In	Sc	Y	2.300	0.883	Zn	Cd	Ti	Zr	Al	Ga	In	Sc	2.657	0.842	Mg	Ca	Ba	Zn	Si	Ge	Ti	Hf	3.257	0.921		
Mg	Ba	Ge	Hf	Al	Ga	In	Y	1.825	0.684	Be	Ca	Ge	Zr	Al	Ga	In	Y	2.300	0.883	Mg	Ca	Ba	Cd	Ge	Sn	Ti	Zr	2.657	0.767	Be	Mg	Ba	Zn	Ge	Ti	Zr	Hf	3.258	0.896		
Ba	Cd	Si	Hf	Al	Ga	In	Sc	1.826	1.066	Be	Sr	Si	Zr	Ga	In	Sc	Y	2.300	1.136	Ca	Sr	Ti	Hf	Al	Ga	Sc	Y	2.657	1.171	Be	Zn	Si	Ti	Al	Ga	In	Sc	3.261	1.376		
Sr	Ba	Sn	Ti	Al	In	Sc	Y	1.827	1.054	Ca	Ba	Si	Ti	Al	Ga	In	Y	2.302	1.139	Ca	Sr	Ba	Cd	Sn	Ti	Zr	Hf	2.658	1.196	Be	Ca	Sr	Zn	Si	Ti	Zr	Hf	3.266	1.441		
Mg	Ca	Si	Sn	Al	Ga	In	Sc	1.828	0.998	Be	Ba	Zn	Cd	Ge	Sn	Zr	Hf	2.303	0.883	Be	Ca	Ba	Cd	Si	Ge	Zr	Hf	2.658	0.916	Mg	Ca	Ba	Zn	Si	Ge	Ti	Zr	3.268	1.213		
Be	Ba	Sn	Zr	Al	Ga	In	Sc	1.829	0.784	Be	Sr	Ba	Cd	Si	Sn	Zr	Hf	2.303	0.991	Be	Cd	Si	Hf	Ga	In	Sc	Y	2.658	1.050	Be	Mg	Si	Ti	Al	Ga	In	Y	3.269	1.281		
Mg	Ca	Si	Sn	Al	Ga	In	Sc	1.829	0.830	Ca	Cd	Ti	Hf	Al	Ga	In	Y	2.304	1.092	Be	Sr	Zn	Cd	Si	Ge	Sn	Zr	2.659	1.091	Mg	Ca	Ba	Zn	Sn	Ti	Zr	Hf	3.271	1.365		
Be	Sr	Sn	Ti	In	Ga	Sc	Y	1.831	0.814	Sr	Cd	Ti	Zr	Al	Ga	In	Sc	2.305	0.829	Be	Sr	Zn	Cd	Si	Sn	Ti	Zr	2.659	0.814	Be	Ca	Ba	Zn	Si	Ge	Ti	Hf	3.271	0.979		
Ca	Zn	Sn	Zr	Al	Ga	In	Sc	1.832	0.757	Sr	Ba	Si	Zr	Al	Ga	In	Sc	2.305	0.858	Be	Mg	Ge	Hf	Ga	In	Sc	Y	2.660	0.868	Be	Mg	Si	Hf	Al	Ga	Sc	Y	3.273	1.066		
Ba	Cd	Si	Ge	Al	Ga	Sc	Y	1.834	0.747	Ba	Cd	Ti	Hf	Al	Ga	Sc	Y	2.305	0.716	Be	Ba	Ti	Zr	Al	Ga	Sc	Y	2.661	0.711	Mg	Ca	Ba	Zn	Ge	Ti	Zr	Hf	3.277	0.892		
Zn	Cd	Si	Sn	Al	Ga	In	Y	1.836	0.716	Ca	Zn	Si	Ge	Al	Ga	Sc	Y	2.305	0.796	Mg	Ba	Zr	Hf	Al	Ga	In	Sc	2.663	0.833	Be	Ca	Sr	Zn	Si	Ge	Ti	Zr	3.278	0.946		
Ca	Ba	Ge	Zr	Al	Ga	In	Y	1.837	0.699	Mg	Ca	Ge	Hf	Al	Ga	In	Sc	2.306	0.825	Be	Mg	Si	Sn	Al	Ga	In	Sc	2.663	0.791	Be	Mg	Ca	Zn	Si	Ge	Sn	Ti	3.281	0.956		
Sr	Cd	Si	Zr	Al	Ga	In	Y	1.837	0.648	Mg	Cd	Zn	Hf	Ga	In	Sc	Y	2.307	0.906	Be	Zn	Sn	Ti	Al	In	Sc	Y	2.663	0.861	Be	Mg	Zn	Cd	Si	Ge	Ti	Hf	3.283	1.017		
Sr	Zn	Si	Hf	Al	Ga	In	Y	1.838	0.954	Be	Ba	Ti	Zr	Ga	In	Sc	Y	2.307	0.942	Be	Cd	Ge	Ti	Al	In	Sc	Y	2.665	0.924	Be	Mg	Si	Hf	Al	Ga	In	Sc	3.284	1.108		
Sr	Ba	Zn	Cd	Si	Ge	Sn	Hf	1.839	0.939	Mg	Cd	Zn	Sr	Al	Ga	Sc	Y	2.309	0.877	Mg	Sr	Ba	Cd	Sn	Ti	Zr	Hf	2.666	0.842	Mg	Ca	Ba	Zn	Si	Ti	Zr	Hf	3.289	0.972		
Ca	Ba	Sn	Ti	Al	Ga	In	Sc	1.839	0.888	Zn	Cd	Ge	Ti	Ga	In	Sc	Y	2.310	0.936	Be	Ca	Ti	Zr	Ga	In	Sc	Y	2.667	0.951	Be	Mg	Ba	Zn	Si	Ge	Ti	Hf	3.295	1.013		
Ca	Cd	Ge	Ti	Al	Ga	In	Y	1.840	0.722	Mg	Sr	Ge	Zr	Al	Ga	Sc	Y	2.311	0.933	Be	Mg	Ba	Cd	Ge	Sn	Zr	Hf	2.668	0.873	Be	Mg	Zn	Cd	Si	Ti	Zr	Hf	3.305	0.990		
Ca	Cd	Si	Ge	Al	Ga	In	Y	1.843	1.083	Mg	Zn	Sn	Zr	Al	Ga	In	Y	2.311	0.925	Ca	Sr	Ba	Cd	Ge	Ti	Zr	Hf	2.668	0.877	Be	Mg	Zn	Cd	Si	Ge	Ti	Zr	3.310	1.031		
Ca	Zn	Si	Ge	Al	Ga	In	Y	1.844	1.068	Zn	Cd	Sn	Ti	Al	Ga	Sc	Y	2.312	0.961	Ca	Sr	Ba	Cd	Si	Ti	Zr	Hf	2.669	0.941	Be	Mg	Ba	Zn	Si	Ge	Ti	Zr	3.315	1.122		
Sr	Cd	Ge	Zr	Al	Ga	Sc	Y	1.844	1.011	Ca	Zn	Si	Hf	Al	Ga	In	Sc	2.313	0.907	Be	Ca	Si	Zr	Al	Ga	In	Y	2.670	0.869	Be	Mg	Si	Ti	Al	In	Sc	Y	3.325	0.992		
Be	Ba	Si	Ge	Al	Ga	In	Sc	1.844	0.836	Be	Sr	Ge	Zr	Al	Ga	Sc	Y	2.313	0.962	Zn	Cd	Ti	Zr	Al	In	Sc	Y	2.670	0.975	Be	Mg	Zr	Hf	Al	Ga	Sc	Y	3.325	1.030		
Ba	Zn	Ge	Ti	Al	In	Sc	Y	1.844	0.902	Ca	Ba	Zn	Si	Ti	Al	Ga	Sc	Y	2.314	0.956	Mg	Ca	Si	Ti	Zr	Al	Ga	In	Y	2.671	0.893	Be	Mg	Sr	Zn	Si	Ge	Zr	Hf	3.326	1.003
Zn	Cd	Sn	Hf	Al	Ga	In	Sc	1.845	0.393	Ca	Ba	Si	Hf	Al	Ga	In	Sc	2.316	0.965	Be	Sr	Si	Zr	Al	Ga	Sc	Y	2.672	1.020	Mg	Ca	Sr	Zn	Si	Ge	Ti	Zr	3.336	1.152		
Mg	Sr	Si	Sn	Al	Ga	In	Sc	1.846	0.354	Ba	Zn	Ti	Zr	Al	In	Sc	Y	2.316	0.987	Ca	Zn	Ti	Zr	Al	In	Sc	Y	2.673	1.061	Be	Mg	Sr	Ba	Si	Ge	Sn	Hf	3.342	1.227		
Be	Ba	Si	Ge	Al	Ga	In	Sc	1.847	0.347	Sr	Ba	Ti	Hf	Al	Ga	In	Y	2.318	0.862	Mg	Ca	Zr	Hf	Ga	In	Sc	Y	2.673	0.910	Be	Mg	Ca	Zn	Si	Sn	Ti	Hf	3.342	1.043		
Ca	Zn	Sn	Zr	Ga	In	Sc	Y	1.847	0.387	Mg	Ba	Si	Hf	Al	In	Sc	Y	2.319	0.927	Ca	Ba	Ti	Zr	Al	Ga	In	Sc	Y	2.673	1.020	Be	Mg	Sr	Zn	Sn	Ti	Zr	Hf	3.342	1.087	
Sr	Zn	Si	Ge	Al	In	Sc	Y	1.848	0.373	Be	Ca	Sn	Zr	Al	Ga	Sc	Y	2.319	0.941	Be	Mg	Sn	Ti	Ga	In	Sc	Y	2.675	0.973	Be	Mg	Sr	Ba	Si	Ge	Sn	Zr	3.347	1.088		
Be	Cd																																								

Ca	Sr	Ge	Hf	Ga	In	Sc	Y	1.927	0.858	Be	Cd	Ge	Hf	Ga	In	Sc	Y	2.376	0.884	Ca	Zn	Ti	Hf	Al	Ga	Sc	Y	2.736	0.923	Be	Mg	Ca	Sr	Ge	Sn	Ti	Zr	3.820	0.901
Sr	Cd	Si	Hf	Al	Ga	In	Sc	1.927	0.645	Ca	Ba	Si	Zr	Al	Ga	In	Sc	2.378	0.973	Be	Sr	Ti	Zr	Al	Ga	In	Sc	2.737	0.947	Be	Mg	Ca	Sr	Si	Sn	Ti	Hf	3.828	0.950
Ca	Ba	Ge	Hf	Al	Ga	In	Sc	1.927	0.664	Sr	Cd	Si	Ti	Al	Ga	Sc	Y	2.378	0.946	Mg	Ba	Si	Ti	Al	Ga	Sc	Y	2.737	0.935	Be	Ca	Sr	Ba	Si	Ge	Zr	Hf	3.834	0.915
Ca	Ba	Zn	Cd	Ge	Sn	Zr	Hf	1.929	1.069	Be	Sr	Si	Hf	Al	In	Sc	Y	2.379	0.678	Be	Ca	Ti	Hf	Al	In	Sc	Y	2.737	0.740	Be	Mg	Ca	Sr	Si	Sn	Ti	Zr	3.834	0.802
Be	Sr	Ge	Hf	Ga	In	Sc	Y	1.931	1.031	Be	Ba	Si	Hf	Al	Ga	In	Sc	2.380	0.719	Mg	Ca	Ti	Hf	Al	Ga	In	Y	2.738	0.789	Be	Mg	Ca	Ba	Si	Ti	Zr	Hf	3.835	0.784
Sr	Cd	Si	Ge	Al	Ga	Sc	Y	1.931	1.022	Be	Zn	Sn	Hf	Ga	In	Sc	Y	2.380	0.617	Be	Zn	Ge	Ti	Al	Ga	In	Y	2.739	0.662	Be	Mg	Sr	Ba	Si	Ge	Zr	Hf	3.839	0.634
Be	Zn	Ge	Sn	Ga	In	Sc	Y	1.932	1.070	Sr	Ba	Ti	Zr	Ga	In	Sc	Y	2.380	0.723	Mg	Cd	Ti	Hf	Ga	In	Sc	Y	2.739	0.705	Be	Mg	Sr	Ba	Si	Ge	Ti	Hf	3.840	0.698
Sr	Ba	Zn	Cd	Si	Ge	Zr	Hf	1.932	1.055	Ca	Cd	Si	Ti	Al	Ga	In	Sc	2.382	0.715	Be	Ca	Ba	Cd	Si	Ti	Zr	Hf	2.740	0.689	Be	Mg	Sr	Ba	Si	Ge	Ti	Zr	3.843	0.666
Be	Zn	Ge	Sn	Al	Ga	In	Y	1.936	0.932	Mg	Ba	Si	Zr	Al	In	Sc	Y	2.382	0.688	Mg	Sr	Ti	Hf	Al	Ga	Sc	Y	2.742	0.749	Be	Mg	Ca	Sr	Ge	Ti	Zr	Hf	3.859	0.818
Mg	Ba	Ge	Zr	Ga	In	Sc	Y	1.936	1.148	Ca	Zn	Ge	Ti	Al	Ga	Sc	Y	2.382	0.730	Be	Mg	Sr	Cd	Ge	Sn	Zr	Hf	2.743	0.799	Be	Mg	Ca	Sr	Si	Ti	Zr	Hf	3.888	0.801
Ca	Sr	Si	Ge	Al	In	Sc	Y	1.936	1.135	Mg	Ba	Zn	Cd	Si	Ge	Sn	Zr	2.383	0.639	Mg	Ca	Ti	Hf	Al	In	Sc	Y	2.743	0.677	Be	Ca	Sr	Ba	Si	Ge	Ti	Zr	3.910	0.660
Be	Ba	Ge	Hf	Al	In	Sc	Y	1.936	1.000	Be	Ba	Ti	Hf	Al	In	Sc	Y	2.384	0.742	Be	Mg	Ba	Cd	Ge	Sn	Ti	Hf	2.744	0.718	Be	Ca	Sr	Ba	Si	Ge	Ti	Hf	3.921	0.721
Mg	Zn	Ge	Sn	Al	In	Sc	Y	1.937	0.808	Mg	Ca	Zn	Cd	Ge	Sn	Zr	Hf	2.384	0.729	Be	Ca	Zr	Hf	Al	In	Sc	Y	2.744	0.698	Be	Mg	Ca	Ba	Si	Ge	Zr	Hf	3.934	0.685
Be	Sr	Sn	Zr	Al	Ga	In	Sc	1.938	1.127	Sr	Ba	Zr	Hf	Al	In	Sc	Y	2.385	0.728	Mg	Cd	Si	Ti	Ga	In	Sc	Y	2.744	0.769	Be	Mg	Ca	Ba	Si	Ge	Ti	Hf	3.956	0.812
Sr	Ba	Zn	Cd	Si	Sn	Ti	Hf	1.938	1.113	Ca	Zn	Si	Zr	Al	Ga	In	Sc	2.386	0.744	Mg	Sr	Zr	Hf	Al	Ga	In	Sc	2.747	0.793	Be	Mg	Ca	Ba	Si	Ge	Ti	Zr	3.961	0.776
Ca	Zn	Ge	Hf	Ga	In	Sc	Y	1.938	0.966	Sr	Ba	Zn	Cd	Si	Ti	Zr	Hf	2.386	0.662	Be	Ca	Sr	Cd	Si	Ge	Zr	Hf	2.747	0.666	Be	Mg	Ca	Sr	Si	Ge	Zr	Hf	3.979	0.638
Zn	Cd	Sn	Hf	Ga	In	Sc	Y	1.939	0.755	Ca	Ba	Ti	Hf	Al	Ga	In	Y	2.392	0.759	Mg	Zn	Ge	Ti	Al	In	Sc	Y	2.749	0.706	Be	Mg	Ca	Sr	Si	Ge	Ti	Hf	4.010	0.694
Mg	Ca	Sn	Zr	Al	Ga	In	Y	1.940	0.761	Mg	Ba	Ti	Zr	Ga	In	Sc	Y	2.393	0.749	Be	Ca	Ge	Ti	Al	Ga	Sc	Y	2.749	0.679	Be	Mg	Ca	Sr	Si	Ge	Ti	Zr	4.017	0.650

Table S5: Bandgaps calculated with exchange parameters of 0.25 and 0.31 in the HSE method

	Reported Eg (eV)	Eg ($\alpha = 0.31$) (eV)	Eg ($\alpha = 0.25$) (eV)
AlN	6.25 (Exp) [Ref. e]	5.7808	5.4387
GaN	3.51 (Exp) [Ref. e]	3.3633	3.0352
ZnSiN ₂	5.44 (GW) [Ref. f]	5.0270	4.6649
ZnGeN ₂	3.42 (GW) [Ref. f]	3.4040	3.0605
ZnSnN ₂	2.02 (GW) [Ref. f]	1.5660	1.2668
MgSiN ₂	5.84 (GW) [Ref. g]	5.7550	5.4091
AlGaIn ₂	4.65 (Exp) [Ref. h]	4.5700	4.2330

References:

- e. Vurgaftman I and Meyer J R. Band parameters for nitrogen-containing semiconductors[J]. Journal of Applied Physics, 2003, 94(6):3675-3696
- f. Punya A, Lambrecht W R L, van Schilfgaarde M. Quasiparticle band structure of Zn-IV-N 2 compounds[J]. Physical Review B, 2011, 84(16): 165204.
- g. Jaroenjittichai A P, Lambrecht W R L. Electronic band structure of Mg- IV- N 2 compounds in the quasiparticle-self-consistent G W approximation[J]. Physical Review B, 2016, 94(12): 125201.
- h. Yun F, Reshchikov M A, He L, et al. Energy band bowing parameter in Al x Ga 1- x N alloys[J]. Journal of applied physics, 2002, 92(8): 4837-4839.