

SUPPLEMENTAL INFORMATION

Fully Automated Total Metals and Chromium Speciation Single Platform Introduction System for ICP-MS

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Table S1. Agilent calibration curve report obtained from Mass Hunter for all elements analyzed for in “total metals” mode.

Tune Mode	m/z	Element	R²	m	b	DL	Units
NoGas	7	Li	1.00000	1.0993	0.000811	0.00037	µg L ⁻¹
NoGas	9	Be	0.99974	0.0003	0.000001	0.01453	µg L ⁻¹
NoGas	11	B	0.99974	0.0002	0.000096	0.18042	µg L ⁻¹
He	23	Na	0.99999	0.3740	0.002915	0.00303	mg L ⁻¹
He	24	Mg	0.99998	0.1500	0.000212	0.00064	mg L ⁻¹
He	27	Al	1.00000	0.0000	0.000028	2.09430	µg L ⁻¹
He	28	Si	0.99845	0.0229	0.205242	0.67679	mg L ⁻¹
He	31	P	0.99999	0.0022	0.000212	0.06479	mg L ⁻¹
He	32	S	0.99832	0.0027	0.087369	3.20005	mg L ⁻¹
He	39	K	0.99998	0.0896	0.005084	0.01038	mg L ⁻¹
He	44	Ca	1.00000	0.0051	0.000038	0.00562	mg L ⁻¹
NoGas	45	Sc	1.00000	3084	990.07	0.10297	µg L ⁻¹
NoGas	47	Ti	0.99999	0.2649	0.000351	0.00020	mg L ⁻¹
O ₂	48	S	1.00000	0.1589	0	0	mg L ⁻¹
O ₂	50	S	0.99999	0.0127	0.000010	0.00128	mg L ⁻¹
He	51	V	0.99997	0.0036	0.000044	0.01767	µg L ⁻¹
He	52	Cr	0.99997	0.0052	0.000464	0.02580	µg L ⁻¹
He	55	Mn	0.99999	0.0014	0.000044	0.02415	µg L ⁻¹
He	56	Fe	0.99940	0.0031	0.002057	0.17566	µg L ⁻¹
H ₂	56	Fe	0.99998	0.0026	0.001622	0.08308	µg L ⁻¹
He	59	Co	0.99999	0.0114	0.000017	0.00304	µg L ⁻¹
He	60	Ni	1.00000	0.0033	0.000359	0.03550	µg L ⁻¹
He	63	Cu	0.99990	0.0099	0.000511	0.01361	µg L ⁻¹
He	66	Zn	1.00000	0.0009	0.000084	0.13704	µg L ⁻¹
NoGas	71	Ga	1.00000	1416	73.333	0.04409	µg L ⁻¹
He	75	As	0.99997	0.0006	0.000006	0.01443	µg L ⁻¹
H ₂	78	Se	0.99993	0.0001	0.000000	0.00306	µg L ⁻¹
NoGas	85	Rb	1.00000	2786	6.666667	0.00622	µg L ⁻¹
He	88	Sr	0.99999	0.0000	0.000000	0.02739	µg L ⁻¹
NoGas	89	Y	0.99999	4129	216.68	0.04002	µg L ⁻¹
NoGas	90	Zr	0.99993	2032	373.35	0.16201	µg L ⁻¹
O ₂	91	As	0.99888	0.0000	0.000121	0.20462	µg L ⁻¹
NoGas	93	Nb	1.00000	3677	56.667	0.01246	µg L ⁻¹
He	95	Mo	0.99999	0.0001	0.000004	0.01687	µg L ⁻¹
NoGas	101	Ru	0.99999	684.8	2733.7	0.81434	µg L ⁻¹
NoGas	105	Pd	0.99997	782.6	16.667	0.04426	µg L ⁻¹
NoGas	107	Ag	0.99998	0.0005	0.000004	0.00711	µg L ⁻¹
He	111	Cd	1.00000	0.0001	0	0.00155	µg L ⁻¹
He	114	Cd	1.00000	0.0002	0	0.00066	µg L ⁻¹

Table S1 (continued). Agilent calibration curve report obtained from Mass Hunter for all elements analyzed for in “total metals” mode.

Tune Mode	m/z	Element	R²	m	b	DL	Units
NoGas	115	In	0.99987	0.0014	0.002423	0.11312	µg L ⁻¹
NoGas	118	Sn	0.99999	0.0004	0.000006	0.01499	µg L ⁻¹
He	118	Sn	0.99998	0.0001	0.000001	0.01768	µg L ⁻¹
He	123	Sb	1.00000	0.0001	0.000000	0.01002	µg L ⁻¹
He	125	Te	0.99945	0.0000	0	0	µg L ⁻¹
NoGas	133	Cs	0.99999	5518	3.3333	0.00314	µg L ⁻¹
He	135	Ba	1.00000	0.0000	0.000000	0.06668	µg L ⁻¹
He	139	La	0.99999	9178	0	0	µg L ⁻¹
NoGas	140	Ce	0.99999	5137	10.000	0.00584	µg L ⁻¹
NoGas	141	Pr	1.00000	5821	1.6667	0.00149	µg L ⁻¹
NoGas	146	Nd	1.00000	1003	0.000000	0	µg L ⁻¹
NoGas	147	Sm	0.99991	868.9	0.000000	0	µg L ⁻¹
NoGas	153	Eu	0.99999	3044	3.3333	0.00284	µg L ⁻¹
NoGas	157	Gd	1.00000	1012	0	0	µg L ⁻¹
NoGas	159	Tb	1.00000	5598	0	0	µg L ⁻¹
NoGas	163	Dy	1.00000	1360	0	0	µg L ⁻¹
NoGas	165	Ho	1.00000	5368	3.3333	0.00323	µg L ⁻¹
NoGas	166	Er	1.00000	1743	0	0	µg L ⁻¹
NoGas	169	Tm	0.99996	5183	596.71	0.15804	µg L ⁻¹
NoGas	172	Yb	1.00000	1180	0	0	µg L ⁻¹
NoGas	175	Lu	1.00000	4845	0	0	µg L ⁻¹
NoGas	178	Hf	0.99986	1326	1.1100	0.00435	µg L ⁻¹
NoGas	181	Ta	1.00000	4494	3.3333	0.00385	µg L ⁻¹
He	182	W	1.00000	0.0005	0.000047	0.05101	µg L ⁻¹
NoGas	185	Re	0.99998	1587	3.3333	0.01092	µg L ⁻¹
NoGas	195	Pt	0.99998	830.3	43.333	0.05519	µg L ⁻¹
NoGas	197	Au	1.00000	1410	3.3333	0.01228	µg L ⁻¹
He	200	Hg	0.99995	0.0001	0.000001	0.01214	µg L ⁻¹
H ₂	200	Hg	0.99991	0.0002	0.000001	0.00493	µg L ⁻¹
He	201	Hg	0.99996	0.0001	0.000000	0.00798	µg L ⁻¹
H ₂	201	Hg	0.99995	0.0001	0.000001	0.00084	µg L ⁻¹
He	202	Hg	0.99996	0.0002	0.000001	0.00343	µg L ⁻¹
H ₂	202	Hg	0.99993	0.0003	0.000002	0.00260	µg L ⁻¹
He	205	Tl	1.00000	0.0010	0.000001	0.00142	µg L ⁻¹
He	206	[Pb]	1.00000	0.0003	0.000013	0.01595	µg L ⁻¹
He	207	[Pb]	1.00000	0.0003	0.000035	0.01594	µg L ⁻¹
He	208	Pb	1.00000	0.0013	0.000076	0.01070	µg L ⁻¹
He	209	Bi	1.00000	0.0010	0.000044	0.00535	µg L ⁻¹
NoGas	232	Th	0.99995	3661	1.6667	0.00237	µg L ⁻¹

Table S1 (continued). Agilent calibration curve report obtained from Mass Hunter for all elements analyzed for in “total metals” mode.

Tune Mode	m/z	Element	R²	m	b	DL	Units
He	238	U	1.00000	0.0014	0.000000	0.00028	µg L ⁻¹
NoGas	72	Ge	ISTD	ISTD	ISTD	ISTD	ISTD
He	72	Ge	ISTD	ISTD	ISTD	ISTD	ISTD
H ₂	72	Ge	ISTD	ISTD	ISTD	ISTD	ISTD
NoGas	103	Rh	ISTD	ISTD	ISTD	ISTD	ISTD
He	103	Rh	ISTD	ISTD	ISTD	ISTD	ISTD
H ₂	103	Rh	ISTD	ISTD	ISTD	ISTD	ISTD
O ₂	103	Rh	ISTD	ISTD	ISTD	ISTD	ISTD
NoGas	193	Ir	ISTD	ISTD	ISTD	ISTD	ISTD
He	193	Ir	ISTD	ISTD	ISTD	ISTD	ISTD
H ₂	193	Ir	ISTD	ISTD	ISTD	ISTD	ISTD

m = slope, b = intercept, DL = (3 x σ_{blank})/m

Table S2. Method Limits of detection (LOD) and limit of quantification (LOQ) for “total metals” mode.

Tune Mode	m/z	Element	Method LOD	Method LOQ	Units
NoGas	7	Li	0.047	0.148	mg L ⁻¹
NoGas	9	Be	0.005	0.017	µg L ⁻¹
NoGas	11	B	0.245	0.818	µg L ⁻¹
He	23	Na	0.006	0.021	mg L ⁻¹
He	24	Mg	0.001	0.004	mg L ⁻¹
He	27	Al	0.618	2.061	µg L ⁻¹
He	28	Si	0.018	0.061	mg L ⁻¹
He	39	K	0.005	0.017	mg L ⁻¹
He	44	Ca	0.004	0.014	mg L ⁻¹
NoGas	45	Sc	0.038	0.128	µg L ⁻¹
NoGas	47	Ti	0.002	0.005	mg L ⁻¹
O ₂	48	S	0.003	0.009	mg L ⁻¹
O ₂	50	S	0.001	0.002	mg L ⁻¹
He	51	V	0.013	0.042	µg L ⁻¹
He	52	Cr	0.019	0.064	µg L ⁻¹
He	55	Mn	0.031	0.104	µg L ⁻¹
He	56	Fe	0.253	0.843	µg L ⁻¹
H ₂	56	Fe	0.357	1.190	µg L ⁻¹
He	59	Co	0.003	0.008	µg L ⁻¹
He	60	Ni	0.016	0.052	µg L ⁻¹
He	63	Cu	0.050	0.168	µg L ⁻¹
He	66	Zn	0.034	0.115	µg L ⁻¹
NoGas	71	Ga	0.042	0.140	µg L ⁻¹
He	75	As	0.011	0.038	µg L ⁻¹
H ₂	78	Se	0.004	0.013	µg L ⁻¹
NoGas	85	Rb	0.002	0.007	µg L ⁻¹
He	88	Sr	0.011	0.035	µg L ⁻¹
NoGas	89	Y	0.003	0.009	µg L ⁻¹
NoGas	90	Zr	0.006	0.020	µg L ⁻¹
O ₂	91	As	0.093	0.310	µg L ⁻¹
NoGas	93	Nb	0.002	0.008	µg L ⁻¹
He	95	Mo	0.003	0.011	µg L ⁻¹
NoGas	101	Ru	0.059	0.196	µg L ⁻¹
NoGas	105	Pd	0.004	0.014	µg L ⁻¹
NoGas	107	Ag	0.004	0.012	µg L ⁻¹
He	111	Cd	0.002	0.006	µg L ⁻¹
He	114	Cd	0.001	0.005	µg L ⁻¹
NoGas	118	Sn	0.020	0.066	µg L ⁻¹
He	118	Sn	0.027	0.090	µg L ⁻¹

Table S2 (continued). Method Limits of detection (LOD) and limit of quantification (LOQ) for “total metals” mode.

Tune Mode	m/z	Element	Method LOD	Method LOQ	Units
He	123	Sb	0.006	0.019	$\mu\text{g L}^{-1}$
He	125	Te	0.001	0.002	$\mu\text{g L}^{-1}$
NoGas	133	Cs	0.001	0.005	$\mu\text{g L}^{-1}$
He	135	Ba	0.016	0.054	$\mu\text{g L}^{-1}$
He	139	La	0.001	0.003	$\mu\text{g L}^{-1}$
NoGas	140	Ce	0.001	0.004	$\mu\text{g L}^{-1}$
NoGas	141	Pr	0.001	0.002	$\mu\text{g L}^{-1}$
NoGas	146	Nd	0.002	0.006	$\mu\text{g L}^{-1}$
NoGas	147	Sm	0.001	0.002	$\mu\text{g L}^{-1}$
NoGas	153	Eu	0.001	0.003	$\mu\text{g L}^{-1}$
NoGas	157	Gd	0.001	0.005	$\mu\text{g L}^{-1}$
NoGas	159	Tb	0.001	0.002	$\mu\text{g L}^{-1}$
NoGas	163	Dy	0.001	0.002	$\mu\text{g L}^{-1}$
NoGas	165	Ho	0.001	0.002	$\mu\text{g L}^{-1}$
NoGas	166	Er	0.001	0.002	$\mu\text{g L}^{-1}$
NoGas	169	Tm	0.006	0.021	$\mu\text{g L}^{-1}$
NoGas	172	Yb	0.002	0.008	$\mu\text{g L}^{-1}$
NoGas	175	Lu	0.002	0.006	$\mu\text{g L}^{-1}$
NoGas	178	Hf	0.004	0.012	$\mu\text{g L}^{-1}$
NoGas	181	Ta	0.002	0.006	$\mu\text{g L}^{-1}$
He	182	W	0.002	0.007	$\mu\text{g L}^{-1}$
NoGas	185	Re	0.001	0.003	$\mu\text{g L}^{-1}$
NoGas	195	Pt	0.004	0.013	$\mu\text{g L}^{-1}$
NoGas	197	Au	0.011	0.037	$\mu\text{g L}^{-1}$
He	201	Hg	0.006	0.019	$\mu\text{g L}^{-1}$
H ₂	201	Hg	0.007	0.025	$\mu\text{g L}^{-1}$
He	205	Tl	0.001	0.004	$\mu\text{g L}^{-1}$
He	208	Pb	0.006	0.020	$\mu\text{g L}^{-1}$
He	209	Bi	0.005	0.016	$\mu\text{g L}^{-1}$
NoGas	232	Th	0.017	0.056	$\mu\text{g L}^{-1}$
He	238	U	0.001	0.003	$\mu\text{g L}^{-1}$

Method LOD = $3 \times \sigma_{\text{blank concentration}}$

Method LOQ = $10 \times \sigma_{\text{blank concentration}}$

Table S3. Sample comparison results from the old method and the new method (prepFAST IC in “total metals” mode).

	Waste Water 1		Waste Water 2		Waste Water 3		Industrial Water 1	
	prepFAST	Old	prepFAST	Old	prepFAST	Old	prepFAST	Old
	IC	Method	IC	Method	IC	Method	IC	Method
	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$
9 Be [NoGas]	0.050	0.081	0.008	0.009	0.053	0.064	0.010	0.012
11 B [NoGas]	18.6	19.7	5.94	13.9	10.6	11.8	38.0	40.2
23 Na [He]	32.8	21.0	27.8	18.5	3.78	2.35	78.8	52.6
24 Mg [He]	2.68	2.53	0.978	0.922	0.486	0.408	5.93	5.40
27 Al [He]	1467	1511	569	611	69.9	69.3	647	672
39 K [He]	4.74	4.16	2.04	1.85	0.351	0.332	14.3	12.3
44 Ca [He]	10.5	10.2	5.30	5.35	1.06	0.978	19.4	18.9
47 Ti [NoGas]	0.100	0.099	0.048	0.056	0.006	0.006	0.004	0.002
51 V [He]	2.74	3.31	1.86	2.26	0.389	0.585	0.149	0.352
52 Cr [He]	2.15	1.83	1.12	0.730	0.433	0.401	0.264	0.171
55 Mn [He]	52.9	60.2	71.2	80.1	7.29	7.90	56.9	61.4
56 Fe [H2]	2356	2755	1453	1431	177	176	114	116
59 Co [He]	1.50	1.51	0.646	0.693	0.340	0.336	0.200	0.148
60 Ni [He]	2.15	2.29	1.18	0.929	0.655	0.400	1.46	1.30
63 Cu [He]	10.9	11.5	19.0	20.6	228	241	35.4	36.9
66 Zn [He]	45.8	42.4	32.9	31.0	458	412	129	118
75 As [He]	4.46	5.94	1.03	1.11	0.177	0.232	0.907	0.976
78 Se [H2]	0.171	0.766	0.336	0.532	0.138	0.626	0.307	0.573
88 Sr [He]	58.1	56.9	28.5	36.3	6.05	7.93	83.2	104
89 Y [NoGas]	2.04	1.77	0.392	0.464	0.274	0.224	1.05	1.13
107 Ag [NoGas]	0.109	0.110	0.023	0.023	0.021	0.013	0.047	0.012
114 Cd [He]	0.078	0.113	0.023	0.025	0.086	0.116	0.028	0.030
118 Sn [NoGas]	1.55	0.953	0.443	0.532	0.903	0.825	0.328	0.199
123 Sb [He]	0.412	0.441	0.351	0.441	0.548	0.474	0.302	0.211
135 Ba [He]	35.7	44.0	18.3	23.9	5.14	6.42	5.80	7.25
139 La [He]	5.69	7.79	1.46	1.97	0.104	0.137	0.043	0.048
182 W [He]	1.43	1.25	0.887	0.820	0.542	0.490	0.559	0.630
201 Hg [He]	0.089	0.050	0.106	0.090	0.102	0.070	0.125	0.110
205 Tl [He]	0.128	0.128	0.030	0.036	0.016	0.022	0.003	0.004
206 [Pb] [He]	1.85		3.41		2.36		1.47	
207 [Pb] [He]	1.62		3.09		2.19		1.36	
208 Pb [He]	1.71	1.92	3.25	3.58	2.28	2.63	1.38	1.61
209 Bi [He]	3.36	2.90	0.213	0.257	0.054	0.075	0.263	0.179
238 U [He]	0.367	0.394	0.140	0.151	0.057	0.069	0.060	0.059

Table S3 (continued). Sample comparison results from the old method and the new method (prepFAST IC in “total metals” mode).

	Waste Water 4		Sludge 1		Soil 1		Sand 1	
	prepFAST	Old	prepFAST	Old	prepFAST	Old	prepFAST	Old
	IC	Method	IC	Method	IC	Method	IC	Method
	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$
9 Be [NoGas]	0.040	0.017	393		671		39	
11 B [NoGas]	42.2	40.2	740		4967		360	
23 Na [He]	81.8	94.4	117		187		63	
24 Mg [He]	6.56	5.94	6762		5975		5262	
27 Al [He]	652	664	10684041		12819286		5955112	
39 K [He]	14.4	12.4	599		2430		419	
44 Ca [He]	22.1	20.7	4774		8845		7379	
47 Ti [NoGas]	0.030	0.030	1345		533		441	
51 V [He]	1.37	1.66	34504	31112	30062	30088	29799	27760
52 Cr [He]	2.31	1.91	13876	12562	27939	29897	30022	57259
55 Mn [He]	87.4	90.3	347114		331725		139319	
56 Fe [H2]	1222	1223	11418178		23574279		10437404	
59 Co [He]	0.396	0.466	8934		9946		9386	
60 Ni [He]	3.29	3.05	11370	10566	27177	23369	17650	15941
63 Cu [He]	201	212	10875	9993	14871	12662	38966	40085
66 Zn [He]	253	234	33924	32513	50460	52604	19455	18264
75 As [He]	1.31	1.34	1966	1895	5224	4569	5357	4788
78 Se [H2]	0.541	0.809	5490	5317	9132	9211	1155	1274
88 Sr [He]	94.9	116	18213		43288		8326	
89 Y [NoGas]	1.52	1.42	5755		13757		2036	
107 Ag [NoGas]	0.157	0.216	33.8		62.0		19.0	
114 Cd [He]	0.157	0.204	79.6	82.3	39.4	38.7	37.7	40.4
118 Sn [NoGas]	3.57	3.42	189	179	207	218	80.7	86.0
123 Sb [He]	0.476	0.426	18.6	32.7	13.2	12.2	16.2	23.0
135 Ba [He]	19.4	24.3	27774		71636		6925	
139 La [He]	1.66	2.15	13944		32895		1503	
182 W [He]	1.39	1.23	36.2		34.4		44.1	
201 Hg [He]	0.151	0.160	25.3		16.7		5.6	
205 Tl [He]	0.004	0.012	44.3		123		11.1	
206 [Pb] [He]	20.29		7608	7244	13252	12286	1026	1056
207 [Pb] [He]	18.24		6861	6590	11516	10790	899	871
208 Pb [He]	18.9	19.7	7196	6883	12258	11423	962	899
209 Bi [He]	2.72	2.52	47.1		131		12.6	
238 U [He]	0.229	0.257	574		1476		126	

Table S3 (continued). Sample comparison results from the old method and the new method (prepFAST IC in “total metals” mode).

	Soil 2		Soil 3		Soil 4		Sludge 2	
	prepFAST	Old	prepFAST	Old	prepFAST	Old	prepFAST	Old
	IC	Method	IC	Method	IC	Method	IC	Method
	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$
9 Be [NoGas]	590		383		451		675	
11 B [NoGas]	2231		2511		1794		6386	
23 Na [He]	212		215		233		264	
24 Mg [He]	10712		6476		8178		7380	
27 Al [He]	10319656		8896848		7418467		15214958	
39 K [He]	1434		1791		1057		3078	
44 Ca [He]	43995		27435		31751		5095	
47 Ti [NoGas]	501		735		794		572	
51 V [He]	27900	24416	28059	24587	25004	26736	42622	44437
52 Cr [He]	48064	50636	31607	27792	29325	28483	32950	33655
55 Mn [He]	445356		326790		395102		422672	
56 Fe [H2]	20260962		15875361		14457679		29098594	
59 Co [He]	12887		9346		10260		12460	
60 Ni [He]	60614	62886	28502	29911	23235	22697	38588	39931
63 Cu [He]	18599	17934	18050	19634	15814	13354	20888	21740
66 Zn [He]	46308	48213	50825	45565	35703	41421	68871	70943
75 As [He]	5970	5202	4148	4240	3388	2993	9610	9837
78 Se [H2]	5769	5675	5690	5467	7402	7802	9650	9546
88 Sr [He]	176992		94976		133765		40150	
89 Y [NoGas]	7913		7479		7229		15605	
107 Ag [NoGas]	54.7		70.6		50.9		68.2	
114 Cd [He]	64.2	62.8	80.9	70.4	71.7	68.7	53.2	50.3
118 Sn [NoGas]	308	251	466	428	1263	1195	197	184
123 Sb [He]	16.6	20.0	20.7	16.0	29.8	34.0	10.9	13.0
135 Ba [He]	58695		55752		34156		106345	
139 La [He]	13570		14173		26966		34229	
182 W [He]	90.3		92.7		592		28.9	
201 Hg [He]	9.3		27.4		6.00		21.5	
205 Tl [He]	97.8		102		48.3		136	
206 [Pb] [He]	11753	10819	11984	10843	6525	6132	14715	13371
207 [Pb] [He]	10634	9754	10844	9852	5814	5956	12731	11627
208 Pb [He]	11164	10269	11385	12278	6174	5809	13588	12324
209 Bi [He]	159		119		56.5		145	
238 U [He]	979		819		545		833	

Table S3 (continued). Sample comparison results from the old method and the new method (prepFAST IC in “total metals” mode).

	Soil 2		Soil 3		Soil 4	
	prepFAST	Old	prepFAST	Old	prepFAST	Old
	IC	Method	IC	Method	IC	Method
	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$	$\mu\text{g L}^{-1}$
9 Be [NoGas]	575		415		265	
11 B [NoGas]	3676		2083		1340	
23 Na [He]	240		277		211	
24 Mg [He]	7040		7508		3749	
27 Al [He]	11325613		8762347		5155306	
39 K [He]	1868		1269		894	
44 Ca [He]	26218		26975		30190	
47 Ti [NoGas]	382		714		304	
51 V [He]	27329	23696	28302	29430	13253	11603
52 Cr [He]	32276	28263	36817	33963	14612	15797
55 Mn [He]	374843		371015		248103	
56 Fe [H2]	21723582		15423661		9547177	
59 Co [He]	11712		10411		5095	
60 Ni [He]	46047	40134	33113	36530	10741	12889
63 Cu [He]	19941	17111	14272	12962	11262	9816
66 Zn [He]	69438	62236	38120	39803	31047	27803
75 As [He]	7146	6492	4972	4828	2469	2982
78 Se [H2]	7120	7212	6234	5643	4977	4561
88 Sr [He]	104000		128718		87410	
89 Y [NoGas]	10544		6911		6583	
107 Ag [NoGas]	75.9		275		57.9	
114 Cd [He]	94.9	89.6	72.6	73.3	56.7	55.1
118 Sn [NoGas]	218	197	431	363	182	187
123 Sb [He]	14.5	16.9	21.3	23.0	18.6	17.0
135 Ba [He]	83413		41539		20621	
139 La [He]	20078		13703		14314	
182 W [He]	43.3		179		117	
201 Hg [He]	19.1		31.6		6.0	
205 Tl [He]	109		73.3		54.7	
206 [Pb] [He]	15501	15506	13358	13073	6556	6760
207 [Pb] [He]	13882	14036	12183	13882	5765	5938
208 Pb [He]	14633	15656	12767	13415	6143	5753
209 Bi [He]	145		101		52.3	
238 U [He]	1124		730		580	