

Table S1: Atomic ratios (cation/Mg) of standards and samples prior to and after processing through the chromatographic separation protocol.

Sample	Type of material	Na/Mg	Al/Mg	Ca/Mg	Ti/Mg	V/Mg	Cr/Mg	Mn/Mg	Fe/Mg	Ni/Mg	Fraction of cations separated from Mg on column 1
DTS-2B unprocessed (USGS values)	Dunite	0.000710	0.007255	0.001832	ND	0.000035	0.024313	0.001232	0.079304	0.005253	
<i>DTS-2B Mg pure</i>		<0.000710	<0.000270	<0.000788	0.000008	0.000003	0.000007	<0.000013	<0.000348	<0.000008	0.75
BIR-1 unprocessed (USGS values)	Icelandic Basalt	0.244028	1.263308	0.985475	0.049947	0.002529	0.002957	0.010248	0.589543	0.001203	
<i>BIR-1 Mg pure</i>		0.000956	0.000464	0.001253	0.000020	<0.000001	<0.000002	<0.000004	<0.000131	<0.000004	0.95
Allende unprocessed	CV bulk	0.020446	0.101790	0.045960	0.002547	0.000269	0.009962	0.004007	0.666578	0.034655	
<i>Allende Mg pure</i>		<0.000317	<0.000450	<0.000121	<0.000051	<0.000005	0.000301	0.000015	<0.000026	<0.000004	0.93
Tennasilim unprocessed	Ordinary chondrite, L4	0.043146	0.059424	0.037839	0.001791	0.000127	0.004121	0.006926	0.412664	0.018663	
<i>Tennasilim Mg pure</i>		0.001162	0.000635	0.001012	0.000019	<0.000001	<0.000002	<0.000004	<0.000174	<0.000004	0.92
J11 unprocessed	Olivine from Iherzolite	ND	0.001130	ND	0.000039	0.000004	0.000140	0.001388	0.093683	0.004101	
<i>J11 Mg pure</i>		<0.000529	<0.000450	<0.000182	<0.000039	<0.000004	<0.000140	0.000006	<0.000174	<0.000004	0.96
A62 unprocessed	CAI	0.057172	7.478637	4.041234	0.117127	0.001913	0.003010	0.000983	0.125345	0.000925	
<i>A62 Mg pure</i>		ND	<0.000180	<0.000485	<0.000041	<0.000010	0.000071	0.000202	0.000135	0.000096	0.996
A3 unprocessed	CAI	0.892728	2.724007	0.602016	0.024567	0.002229	0.008642	0.005656	0.630415	0.001036	
<i>A3 Mg pure</i>		ND	<0.000090	<0.000303	<0.000025	<0.000005	0.000020	0.000172	<0.000087	<0.000021	0.86

Table S2: Atomic ratios (cation/Ti) of standards and samples prior to and after processing through the chromatographic separation protocol.

Sample	Type of material	Ca/Ti	V/Ti	Cr/Ti
BHVO-2 unprocessed (USGS values)	Hawaiian Basalt	5.9864	0.023227	0.020516
<i>BHVO-2 Ti pure</i>		0.0010	0.000001	0.000004
BCR-2 unprocessed (USGS values)	Columbia River Basalt	4.5031	0.028955	0.001227
<i>BCR-2 Ti pure</i>		0.0217	0.000001	0.000009
BIR-1 unprocessed (USGS values)	Icelandic Basalt	19.7304	0.050624	0.059197
<i>BIR-1 Ti pure</i>		0.0038	0.000003	0.000019
Alfianello unprocessed	Ordinary chondrite, L6	14.3990	0.103000	5.581000
<i>Alfianello Ti pure</i>		0.0332	0.000001	0.000079
A62 unprocessed	CAI	34.5030	0.016333	0.025702
<i>A62 Ti pure</i>		0.0012	0.000007	0.000597
A3 unprocessed	CAI	24.5047	0.090724	0.351768
<i>A3 Ti pure</i>		0.0066	0.000002	0.000032

Note: ND = Not Determined