Table S1. Re-Os data for molybdenite samples from the Wulandele Mo deposit.

Sample	Weight (g)	Re (±2σ) (ppm)	Normal Os (±2σ) (ppb)	^{187}Re (±2σ) (ppm)	^{187}Os (±2σ) (ppb)	Modal age (±2σ) (Ma)
A10-607	0.03314	31.82±0.24	0.2757±0.02	20±0.15	44.98±0.4	134.8±1.9

Table S2. Major element contents and relative parameters of the MG from the Wulandele Mo deposit (SiO_2-total: %; T_{zr}: °C).

Samples	ZK1525-1	ZK1302-1	ZK502-1	ZK1103-1	ZK1708-1	ZK1078-2
SiO_2	71.7	71.7	72.5	72.6	73.6	73.8
TiO_2	0.22	0.22	0.20	0.21	0.22	0.17
Al_2O_3	14.30	14.20	14.25	14.25	13.65	13.75
Fe_2O_{3T}	2.04	2.02	1.96	1.94	1.92	1.76
FeO	1.36	1.38	1.32	1.26	1.32	1.10
CaO	1.22	1.11	1.11	1.12	1.02	0.92
MgO	0.37	0.36	0.36	0.36	0.35	0.27
K_2O	4.70	4.96	4.91	4.90	4.70	4.71
Na_2O	4.01	3.79	3.87	3.89	3.76	4.01
P_2O_5	0.07	0.07	0.07	0.07	0.06	0.05
MnO	0.05	0.05	0.05	0.05	0.04	0.04
LOI	0.62	0.48	0.48	0.51	0.36	0.42
Total	99.3	99.0	99.8	99.9	99.7	99.9
Mg#	26.43	26.09	26.67	26.88	26.53	23.30
K_2O+Na_2O	8.71	8.75	8.78	8.79	8.46	8.72
A/NK	1.22	1.22	1.22	1.22	1.21	1.18
A/CNK	1.03	1.05	1.04	1.04	1.04	1.03
Fe_2O_3/FeO	0.39	0.35	0.37	0.43	0.35	0.49
ΔOx	-0.05	-0.10	-0.08	-0.01	-0.11	0.04
T_{zr}	786	782	779	782	779	760

$Mg^{\#}$ = 100*(MgO/40.3044)/(MgO/40.3044+FeO*/71.844); A/NK = (Al_2O_3/101.94)/((Na_2O/61.982) + (K_2O/94.2)); A/CNK = (Al_2O_3/101.94)/((CaO/56.08) + (Na_2O/61.982) + (K_2O/94.2)); ΔOx = $\log_{10}$(Fe_2O_3/FeO) + 0.3 + 0.03TFeO.

Table S3. Trace element contents and relative parameters of the MG from the Wulandele Mo deposit(Rb-Zr: ppm).

Samples	ZK1525-1	ZK1302-1	ZK502-1	ZK1103-1	ZK1708-1	ZK1078-2
Rb	416	291	382	416	322	389
Sr	201.0	187.0	174.5	182.5	123.5	124.0
Ba	629	561	508	550	344	376
La	41.7	37.0	35.7	38.7	26.7	29.0
Ce	78.2	70.1	68.7	73.4	56.1	56.5
Pr	7.90	7.00	6.83	7.44	6.05	5.64
Nd	25.6	22.3	22.8	24.0	21.4	18.9
Sm	4.52	3.83	4.11	4.32	4.38	3.74
Eu	0.71	0.65	0.63	0.58	0.54	0.44
Gd	3.11	2.99	3.23	2.99	3.34	3.18
Tb	0.40	0.39	0.42	0.39	0.49	0.48
Dy	1.93	1.82	2.10	1.91	2.71	2.55
Ho	0.31	0.32	0.38	0.33	0.52	0.49
Er	0.85	0.78	0.95	0.79	1.41	1.31
Tm	0.13	0.13	0.15	0.13	0.20	0.23
Yb	0.67	0.70	0.92	0.73	1.28	1.39
Lu	0.11	0.09	0.15	0.11	0.21	0.21
Hf	4.9	4.4	4.6	4.6	4.8	4.1
Ta	2.6	2.2	2.3	2.4	3.4	3.8
Pb	32.1	27.9	27.5	29.7	27.5	33.6
Th	34.4	33.7	32.4	34.0	27.6	27.1
U	17.55	14.25	16.10	7.05	13.70	16.55
Sc	2.5	2.3	2.4	2.6	3.1	2.9
Y	10.0	10.0	12.3	10.5	16.3	15.6
Nb	18.2	15.8	16.1	17.4	20.9	22.0
Zr	168	156	152	157	149	120
∑REE	166.14	148.10	147.07	155.82	125.33	124.06
LREE/HREE	21.12	19.51	16.72	20.11	11.34	11.61
La_N/Yb_N	44.64	37.91	27.83	38.03	14.96	14.97
δEu	0.55	0.57	0.51	0.47	0.41	0.38
Zr + Nb + Y + Ce	274.4	251.9	249.1	258.3	242.3	214.1
10000*Ga/Al	3.0	2.7	2.8	2.8	3.0	3.2
K/Rb	82.45	125.09	92.15	84.86	104.66	87.92
Rb/Sr	2.07	1.56	2.19	2.28	2.61	3.14

Table S4. Sr-Nd-Pb isotopic compositions of the MG from the Wulandele Mo deposit.

Samples	ZK1525-1	ZK1302-1	ZK502-1	ZK1078-2
t(Ma)	131.3	131.3	131.3	131.3
Rb(ppm)	416	291	382	389
Sr(ppm)	201	187	175	124
$^{87}Rb/^{86}Sr$	5.9887	4.5029	6.3344	9.0775
$^{87}Sr/^{86}Sr$	0.716947	0.714152	0.717516	0.722287
2σ	17	13	11	9
$(^{87}Sr/^{86}Sr)_i$	0.705771	0.705749	0.705695	0.705347
Sm(ppm)	4.52	4.11	3.83	3.74
Nd(ppm)	25.6	22.3	22.8	18.9
$^{147}Sm/^{144}Nd$	0.1067	0.1114	0.1015	0.1196
$^{143}Nd/^{144}Nd$	0.512476	0.512462	0.512472	0.512503
2σ	10	8	12	8
$(^{143}Nd/^{144}Nd)_i$	0.512384	0.512366	0.512385	0.512400
$\varepsilon_{Nd}(t)$	-1.7	-2.0	-1.6	-1.3
T_{DM}(Ma)	960	1024	921	1047
$f_{Sm/Nd}$	-0.458	-0.434	-0.484	-0.392
$^{206}Pb/^{204}Pb$	18.742	18.228	18.761	19.014
$^{207}Pb/^{204}Pb$	15.562	15.51	15.539	15.54
$^{208}Pb/^{204}Pb$	38.388	38.015	38.448	38.245
U/ppm	17.55	14.25	16.10	16.55
Th/ppm	34.4	33.7	32.4	27.1
Pb/ppm	32.1	27.9	27.5	33.6
$(^{206}Pb/^{204}Pb)_t$	18.0256	17.5673	17.9933	18.3676
$(^{207}Pb/^{204}Pb)_t$	15.5271	15.4778	15.5016	15.5085
$(^{208}Pb/^{204}Pb)_t$	37.9284	37.5036	37.9423	37.8986

^{87}Rb decay $\lambda = 1.42\times10^{-11}$ year^{-1}; 147Sm decay k = 6.54×10^{-12} year^{-1}; ε_{Nd} (t) were calculated with modern $(^{143}Nd/^{144}Nd)_{CHUR}$=0.512638 and $(^{147}Sm/^{144}Nd)_{CHUR}$=0.1967, and T_{DM} were calculated using present-day $(^{147}Sm/^{144}Nd)_{DM}$=0.2137 and $(^{143}Nd/^{144}Nd)_{DM}$=0.51315 [53]. The $(^{208}Pb/^{204}Pb)_t$, $(^{208}Pb/^{204}Pb)_t$, $(^{208}Pb/^{204}Pb)_t$ were calculated by the Geokit of Lu [25].