

Supplementary Materials

Table S1. LA-ICP-MS zircon U–Pb dating data of the granites from the Maozaishan deposit.

Spot No.	Th	U	Th/U	²⁰⁷ Pb/ ²⁰⁶ Pb		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²⁰⁶ Pb		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³⁸ U	
	ppm	ppm		Ratios	±1σ	Ratios	±1σ	Ratios	±1σ	Ratios	±1σ	Ratios	±1σ	Ratios	±1σ
14D30-1-01	266	707	0.38	0.0509	0.0019	0.1748	0.0063	0.0250	0.0005	239	87	164	5	159	3
14D30-1-02	223	549	0.40	0.0506	0.0026	0.1647	0.0078	0.0241	0.0004	233	123	155	7	154	3
14D30-1-03	309	753	0.41	0.0522	0.0021	0.1794	0.0068	0.0252	0.0004	300	93	168	6	160	3
14D30-1-04*	452	1046	0.43	0.0565	0.0018	0.2117	0.0063	0.0274	0.0004	472	72	195	5	174	2
14D30-1-05*	756	2283	0.33	0.0768	0.0020	0.2766	0.0071	0.0260	0.0003	1117	53	248	6	166	2
14D30-1-06	195	472	0.41	0.0525	0.0029	0.1685	0.0081	0.0243	0.0005	309	119	158	7	155	3
14D30-1-07	267	623	0.43	0.0505	0.0022	0.1709	0.0068	0.0251	0.0004	217	100	160	6	160	3
14D30-1-08	479	1151	0.42	0.0498	0.0017	0.1673	0.0052	0.0246	0.0004	183	78	157	5	156	2
14D30-1-09	455	1182	0.39	0.0496	0.0020	0.1664	0.0060	0.0245	0.0004	176	93	156	5	156	3
14D30-1-10	229	548	0.42	0.0534	0.0028	0.1725	0.0083	0.0238	0.0004	343	119	162	7	152	3
14D30-1-11	247	575	0.43	0.0497	0.0027	0.1630	0.0084	0.0240	0.0005	189	123	153	7	153	3
14D30-1-12	205	511	0.40	0.0517	0.0027	0.1732	0.0081	0.0249	0.0005	333	120	162	7	159	3
14D30-1-13	163	415	0.39	0.0542	0.0046	0.1843	0.0133	0.0256	0.0010	389	195	172	11	163	6
14D30-1-14	207	457	0.45	0.0534	0.0030	0.1821	0.0099	0.0253	0.0006	346	130	170	8	161	3
14D30-1-15	406	1051	0.39	0.0509	0.0025	0.1743	0.0079	0.0250	0.0006	235	115	163	7	159	4
14D30-1-16	174	401	0.43	0.0497	0.0023	0.1690	0.0076	0.0250	0.0005	183	105	159	7	159	3
14D30-1-17	285	644	0.44	0.0506	0.0021	0.1738	0.0075	0.0248	0.0005	233	99	163	6	158	3
14D30-1-18	450	890	0.51	0.0505	0.0021	0.1631	0.0060	0.0239	0.0004	217	96	153	5	152	2
14D30-1-19	233	501	0.47	0.0511	0.0024	0.1764	0.0084	0.0253	0.0005	256	109	165	7	161	3
14D30-1-20*	353	713	0.50	0.0865	0.0051	0.3852	0.0292	0.0315	0.0018	1350	113	331	21	200	11
14D30-1-21	176	437	0.40	0.0530	0.0032	0.1787	0.0104	0.0250	0.0006	328	139	167	9	159	4
14D30-1-22	172	414	0.42	0.0555	0.0061	0.1750	0.0157	0.0247	0.0009	432	248	164	14	157	6

Table S2. LA-ICP-MS trace element compositions of the zircon grains of the granites in the Maozaishan deposit (ppm).

Spot	Ti	Y	Nb	Sn	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	ΣREE	LREE	HREE	δEu	δCe	log(<i>f</i> O ₂)	T (°C)
1	5.11	830	5	0.38	0.02	11.11	0.04	0.99	3	0.18	6.97	6.52	81.5	30.3	137	30.3	310	43.4	661	15.3	645	0.12	99.0	-17.5	685
2	7.88	777	5.02	0.17	0.01	10.15	0.03	1.26	2.91	0.23	6.55	6.31	78.2	29.1	125	28.2	283	39.8	610	14.6	596	0.16	132	-16.6	721
3	6.06	987	6.15	0.15	31.26	75.41	9.29	44.93	12.31	0.25	27.47	8.74	102	37.4	159	34.9	348	50.2	942	173	768	0.04	1.04	-17.2	699
6	7.69	757	4.96	0.27	0.01	8.45	0.06	1	3.07	0.17	6.59	6.28	79.4	28.2	123	27.4	273	40.6	598	12.7	585	0.11	84.1	-16.7	718
7	7.35	783	5.88	0.36	2.66	17.89	0.91	5.04	3.59	0.21	8.64	6.8	81.3	29.9	133	29.4	297	43.9	661	30.3	630	0.11	2.70	-16.8	715
8	5.05	1259	9.28	0.74	0.01	14.85	0.04	1.36	4.22	0.19	10.78	10.45	130	49.1	221	47.1	492	71.3	1052	20.7	1032	0.09	214	-17.6	684
9	2.71	1179	9.39	0.48	0.01	14.68	0.1	1.54	4.38	0.11	9.31	9.32	120	44.6	205	45.5	472	69.3	996	20.8	975	0.05	111	-18.9	638
10	6.02	855	5.54	0.13	1.17	12.15	0.32	2.52	3.58	0.17	8.63	7.3	88.9	31.9	143	30.4	310	46.2	686	19.9	666	0.09	4.62	-17.2	698
11	6.9	901	4.43	0.32	0.01	9.76	0.05	1.07	3.72	0.22	8.24	7.59	89	33	141	31.6	323	46.2	694	14.8	680	0.12	98.0	-16.9	709
12	7.22	767	4.59	0.25	1.92	11.64	0.61	3.35	3.23	0.12	7.45	5.81	75.3	28.8	123	27.9	289	42.5	621	20.9	600	0.07	2.53	-16.8	713
13	3.11	612	3.7	0.01	18.75	45.37	5.28	27.88	6.7	0.28	19.88	5.4	64	22.3	94	21.4	218	33	583	104	479	0.07	1.07	-18.6	648
14	10.62	795	3.67	0.08	0.01	7.81	0.03	1.34	2.93	0.18	6.61	6.5	78.8	29.1	122	28	281	41.6	606	12.3	594	0.12	85.7	-16.0	746
15	4.47	1298	7.8	0.25	9.07	28.36	2.55	16.8	8.89	0.18	16.33	10.73	129	47.3	208	47.8	473	70.3	1068	65.8	1002	0.05	1.38	-17.8	675
16	6.48	693	3.78	0.72	1	9.37	0.37	2.3	3.09	0.2	6.64	5.9	66.4	25.2	110	24.3	249	36.4	540	16.3	523	0.14	3.62	-17.0	704
17	7.01	830	5.71	0	0.01	10.18	0.06	1.04	2.19	0.15	6.83	6.64	82.4	31.3	132	30.7	306	44.8	654	13.6	640	0.11	99.3	-16.9	711
18	5.31	1424	4.9	0	12.82	41.1	4.09	22.5	10.05	0.21	23.47	11.79	144	51.1	212	48.4	469	67	1117	90.8	1027	0.04	1.33	-17.4	688
19	10.97	791	5.1	0.18	4.99	19.99	4.59	10.03	4.99	0.21	10.7	6.72	75.5	29.6	116	27.2	264	39.7	615	44.8	570	0.09	0.98	-15.9	749
21	7.19	640	3.89	0.14	0.01	7.61	0.06	0.58	2.69	0.16	5.88	5	62.5	23.5	96	22.6	224	32.7	483	11.1	472	0.12	74.6	-16.8	713
22	0.96	660	3.72	0.18	0.05	7.17	0.05	0.56	2.07	0.14	6.25	4.8	64	23.5	100	23.1	227	32.1	491	10.0	481	0.12	32.2	-15.8	754

Table S3. $^{40}\text{Ar}/^{39}\text{Ar}$ laser stepwise heating analytical data for two muscovite samples from the Maozaishan deposit.

T (°C)	($^{40}\text{Ar}/^{39}\text{Ar}$)m	($^{36}\text{Ar}/^{39}\text{Ar}$)m	($^{37}\text{Ar}/^{39}\text{Ar}$)m	($^{38}\text{Ar}/^{39}\text{Ar}$)m	^{40}Ar (%)	$^{40}\text{Ar}^*/^{39}\text{Ar}$	^{39}Ar (mol)	^{39}Ar (%)	Age (Ma)	$\pm 1\sigma$ (Ma)
Sample no. 14D30-2, J=0.00482										
700	416.6884	1.3894	0.5555	0.2844	1.47	6.1460	0.12	0.38	53	15
760	35.8839	0.0560	0.0057	0.0241	53.83	19.3180	2.19	7.47	160.6	1.6
800	21.8840	0.0093	0.0000	0.0152	87.38	19.1226	3.58	19.08	159.1	1.5
840	20.3321	0.0055	0.0029	0.0143	92.03	18.7109	4.57	33.90	155.8	1.5
880	19.6364	0.0040	0.0114	0.0141	93.93	18.4455	3.28	44.51	153.7	1.5
920	19.8549	0.0045	0.0123	0.0143	93.28	18.5207	2.48	52.57	154.3	1.5
960	20.0599	0.0052	0.0000	0.0140	92.33	18.5219	2.97	62.19	154.3	1.5
1000	20.2623	0.0058	0.0000	0.0143	91.53	18.5452	4.02	75.23	154.5	1.5
1040	20.6934	0.0074	0.0045	0.0146	89.34	18.4878	4.61	90.17	154.0	1.5
1100	20.5325	0.0068	0.0118	0.0147	90.24	18.5288	2.26	97.51	154.3	1.5
1200	20.8219	0.0064	0.0048	0.0144	90.86	18.9195	0.53	99.22	157.4	1.8
1400	29.1368	0.0352	0.0371	0.0197	64.32	18.7426	0.24	100.00	156.0	3.1
Sample no. 14D32-1, J=0.004827										
700	337.0268	1.1106	0.3645	0.2320	2.63	8.8791	0.06	0.19	76	14
760	39.3669	0.0722	0.0890	0.0267	45.83	18.0413	0.31	1.17	150.6	1.8
820	34.0040	0.0526	0.0483	0.0225	54.27	18.4558	0.65	3.23	154.0	1.7
870	27.2922	0.0302	0.0062	0.0182	67.30	18.3671	1.85	9.11	153.2	1.5
910	20.0967	0.0064	0.0133	0.0137	90.64	18.2161	3.05	18.81	152.0	1.5
950	19.2659	0.0033	0.0022	0.0132	94.84	18.2718	5.56	36.48	152.5	1.5
980	19.2229	0.0032	0.0046	0.0132	95.11	18.2828	5.46	53.84	152.6	1.5
1010	19.3392	0.0034	0.0042	0.0132	94.71	18.3169	5.31	70.74	152.8	1.5
1050	19.4342	0.0040	0.0092	0.0134	93.90	18.2482	4.21	84.14	152.3	1.5
1100	19.1869	0.0033	0.0076	0.0134	94.91	18.2109	2.12	90.89	152.0	1.5
1200	18.9996	0.0021	0.0000	0.0126	96.66	18.3643	1.46	95.53	153.2	1.5
1400	19.2683	0.0031	0.0211	0.0133	95.17	18.3375	1.16	99.22	153.0	1.5
1430	21.9586	0.0122	0.0590	0.0159	83.61	18.3595	0.25	100.00	153.2	2.7