

Table S1. List of samples information.

No.	Sample label	Lithology	Latitude	Longitude	Remarks
1	YF-1	Medium- to coarse-grained biotite porphyritic monzonite granite	26°18'38.2"N	115°11'13.1"E	Yongfeng granite
2	YF-2	Medium- to coarse-grained biotite porphyritic monzonite granite	26°18'38.2"N	115°11'13.1"E	
3	XGml-1	Medium- to coarse-grained biotite porphyritic monzonite granite	26°17'14.7"N	115°15'27.7"E	
4	XGls-12	Medium- to coarse-grained biotite porphyritic monzonite granite	26°14'59.8"N	115°16'26.5"E	
5	XGyf-1	Fine-grained biotite monzonite granite	26°19'55"N	115°11'19.6"E	Longshi granite

Table S2 Results of trace elements in zircons from samples YF-1 and YF-2 (ppm)

No.	Ti	Rb	Sr	Y	Zr	Nb	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb
YF-1-1	4.75	0.40	0.04	1213.61	480178	1.91	0.02	18.01	0.22	3.79	7.14	1.23	33.62	10.51	118.91	42.61	181.62	37.35	337.61
YF-1-2	4.80	0.40	0.24	2315.87	457369	3.72	0.14	65.16	0.71	11.54	18.08	6.56	73.22	21.51	223.66	78.32	336.54	69.81	648.51
YF-1-3	14.71	0.72	0.19	1573.73	471494	4.70	0.19	22.80	0.19	2.85	6.69	0.80	36.69	12.64	144.96	56.21	242.66	47.92	424.80
YF-1-4	4.47	1.72	0.24	2147.01	394758	3.13	0.19	15.31	0.20	4.19	10.52	0.76	59.61	20.25	215.47	77.60	327.02	65.76	584.91
YF-1-5	5.83	0.00	0.05	1285.46	431521	1.54	0.01	9.75	0.19	3.54	6.84	0.91	32.03	10.68	125.51	45.84	197.62	39.43	348.96
YF-1-6	12.22	0.00	0.00	1001.40	491423	2.53	0.02	19.04	0.09	1.64	4.76	0.71	24.83	7.87	91.97	35.64	151.63	32.08	283.89
YF-1-7	4.73	0.05	0.12	759.64	506124	1.53	0.00	9.45	0.04	0.95	2.13	0.13	13.67	4.58	56.31	23.98	118.38	27.28	283.30
YF-1-8	4.87	0.65	0.26	1000.14	540187	2.27	0.01	4.47	0.03	0.66	1.28	0.07	13.19	5.66	77.50	31.28	146.81	34.01	347.08
YF-1-9	5.55	0.22	0.09	1378.62	480828	2.63	0.00	4.46	0.03	0.81	3.42	0.14	24.86	9.33	117.83	47.57	210.31	43.92	407.29

YF-1-10	6.09	0.00	0.03	1018.12	473652	2.85	0.01	19.79	0.08	1.68	4.23	0.38	23.61	7.82	92.89	35.24	153.36	31.77	292.73
YF-1-11	13.65	0.16	0.15	1041.57	407583	1.61	0.10	5.17	0.14	2.00	3.40	0.23	22.47	8.28	96.55	36.63	163.99	33.21	310.68
YF-1-12	7.10	0.06	1.09	1427.91	401773	2.50	4.26	17.14	1.63	9.49	7.15	0.20	32.40	10.94	127.94	49.13	220.34	45.90	416.72
YF-1-13	14.40	0.00	0.13	730.26	375409	1.43	0.01	7.07	0.08	2.07	4.04	0.49	20.07	6.39	74.21	26.15	114.50	22.46	201.38
YF-1-14	3.92	0.25	0.16	850.39	440386	3.11	0.05	13.49	0.05	0.71	1.72	0.11	15.60	5.71	70.09	28.32	129.66	27.80	264.16
YF-1-15	8.43	0.19	0.13	1473.68	379629	2.25	0.02	19.96	0.23	3.73	7.83	0.78	38.11	12.42	143.97	52.23	222.22	44.22	379.52
YF-1-16	1.52	0.26	0.09	2070.85	446161	23.32	0.01	14.11	0.01	0.43	1.76	1.19	20.22	9.40	139.92	61.80	322.23	77.19	767.09
YF-1-17	13.03	0.12	0.13	1739.12	420987	1.61	0.02	7.36	0.30	4.31	8.04	0.45	41.73	14.71	164.30	59.46	250.72	48.40	409.81
YF-1-18	8.80	0.11	0.03	964.84	382885	2.28	0.01	10.61	0.12	1.94	4.61	0.32	23.02	7.69	90.76	33.61	145.76	29.57	262.71
YF-1-19	7.70	0.14	0.35	974.25	353810	3.59	2.64	29.46	1.05	6.01	4.97	0.38	22.30	7.46	91.41	34.50	152.10	31.50	285.22
YF-1-20	2.82	0.00	0.45	1217.68	345458	2.83	3.26	16.08	1.41	7.73	5.86	0.29	27.32	9.30	115.60	41.05	172.33	35.44	298.28
YF-2-1	14.88	4.80	0.48	1850.38	435870	2.45	0.20	6.83	0.31	5.31	8.41	0.47	47.79	15.61	176.76	63.54	270.49	52.41	468.96
YF-2-2	26.58	0.01	0.11	1733.94	481311	1.28	0.07	8.46	0.57	7.59	14.17	1.36	53.13	16.68	176.14	61.16	240.94	46.23	394.39
YF-2-3	19.32	0.00	0.16	1520.83	508867	0.99	0.06	7.95	0.40	7.47	11.30	1.44	45.48	13.95	151.84	51.58	207.21	40.46	344.31
YF-2-4	5.70	0.06	0.06	2153.60	466136	1.63	0.02	2.49	0.19	3.81	8.42	0.29	49.77	16.60	196.46	73.57	316.91	63.47	557.73
YF-2-5	17.34	1.13	0.64	1512.54	520941	2.45	1.57	11.44	0.94	8.88	11.85	0.79	53.82	15.39	152.80	50.73	202.45	39.75	356.28
YF-2-6	6.59	0.08	0.19	1088.56	430757	1.72	0.00	6.16	0.05	2.27	3.66	0.44	22.67	7.97	98.32	38.40	169.61	36.10	341.47
YF-2-7	7.99	0.73	0.14	1574.25	489119	2.06	0.00	3.26	0.11	1.46	4.74	0.14	31.35	11.86	144.89	52.42	225.06	46.23	414.18
YF-2-8	9.88	5.74	0.00	1312.84	503079	2.06	0.97	17.68	0.32	4.02	6.78	1.09	33.36	10.44	125.78	44.85	196.41	39.78	361.86
YF-2-9	4.28	0.65	0.66	739.03	456151	1.69	0.08	5.59	0.09	1.09	2.59	0.47	17.58	5.97	70.15	25.59	113.01	22.90	203.97
YF-2-10	5.52	1.11	2.44	1021.60	482669	3.28	21.76	89.23	####	71.59	37.42	1.41	60.92	15.25	125.03	37.14	145.60	29.14	266.34
YF-2-11	10.41	0.24	0.23	2147.19	510355	2.44	0.79	7.19	0.49	6.62	10.91	0.34	58.60	17.95	208.89	74.72	316.29	62.89	558.55
YF-2-12	4.37	0.00	0.06	802.50	505207	2.06	0.01	10.12	0.09	1.26	3.03	0.25	17.31	6.18	72.59	27.93	120.46	24.71	229.96
YF-2-13	4.25	0.00	0.08	1956.94	474831	4.47	0.28	10.41	0.34	3.02	5.85	0.32	34.81	13.12	166.58	65.86	304.84	68.71	637.86
YF-2-14	7.60	0.22	0.00	781.35	518568	2.71	0.00	15.76	0.06	1.11	2.72	0.52	16.83	5.82	69.26	26.09	118.68	24.96	227.65
YF-2-15	8.57	0.46	0.14	2124.94	479316	3.31	0.16	17.37	0.85	12.98	18.19	5.40	80.04	23.37	229.61	76.33	297.60	56.85	487.62

YF-2-16	12.78	0.44	0.15	867.69	480925	2.90	3.27	16.63	1.50	8.12	6.31	0.32	23.93	7.68	83.99	29.50	125.18	27.60	269.00
YF-2-17	5.17	0.19	0.79	1178.25	458681	3.90	7.60	39.08	2.34	13.35	7.03	0.46	28.93	8.94	110.34	40.06	178.61	37.34	334.99
YF-2-18	13.95	0.00	0.03	937.67	378596	1.62	0.03	5.61	0.13	2.96	5.07	0.37	25.72	8.18	96.27	34.50	143.83	28.65	264.15
YF-2-19	8.97	0.06	1.13	1274.23	436336	2.96	7.22	31.37	2.78	14.55	7.52	0.48	30.56	10.03	122.82	43.48	194.66	41.08	375.73
YF-2-20	12.76	0.02	0.19	2041.48	432381	3.75	0.33	9.85	0.27	2.54	6.80	0.27	40.21	14.53	186.85	71.67	323.29	66.59	592.42
YF-2-21	5.68	0.00	0.30	1493.11	409103	3.54	0.79	10.78	0.53	4.61	5.59	0.25	31.57	11.32	140.61	52.36	231.48	49.04	454.83

(continued)

No.	Lu	Hf	Ta	Pb	Th	U	ΣREE	LREE	HREE	LREE/HREE	Eu/Eu*	Ce/Ce*	T _{ri} (°C)	Ce ⁴⁺ /Ce ³⁺	lgf(O ₂)	ΔFMQ
YF-1-1	65.70	10967.72	1.12	5.88	146.61	201.87	858.35	30.42	827.93	0.04	0.24	67.45	724	18.18	-18.10	-2.03
YF-1-2	125.88	9979.08	1.27	14.54	666.90	400.37	1679.63	102.18	1577.45	0.06	0.55	51.49	725	20.01	-17.72	-1.67
YF-1-3	80.18	9702.62	1.83	44.57	474.87	528.76	1079.59	33.53	1046.06	0.03	0.16	29.19	838	33.80	-10.54	2.98
YF-1-4	112.54	9367.73	2.12	25.10	499.95	920.80	1494.34	31.17	1463.17	0.02	0.09	19.26	719	13.07	-19.55	-3.34
YF-1-5	65.51	9376.00	0.86	6.57	163.68	232.39	886.82	21.24	865.58	0.02	0.19	51.91	743	10.51	-19.06	-3.45
YF-1-6	53.70	10810.69	1.39	8.42	192.00	296.07	707.87	26.26	681.61	0.04	0.20	109.93	817	46.64	-10.23	3.71
YF-1-7	57.47	10192.34	0.62	82.86	127.12	395.98	597.68	12.70	584.98	0.02	0.07	1.10	724	67.74	-13.33	2.76
YF-1-8	70.36	14034.04	1.72	134.57	90.15	1010.74	732.42	6.53	725.89	0.01	0.05	53.92	727	60.84	-13.58	2.43
YF-1-9	78.68	11976.84	1.59	35.52	169.40	512.28	948.64	8.85	939.79	0.01	0.05	1.14	739	27.33	-15.90	-0.18
YF-1-10	54.29	11308.14	1.90	16.52	367.29	586.26	717.88	26.17	691.71	0.04	0.12	153.30	747	51.82	-13.13	2.39
YF-1-11	58.23	10617.42	1.01	6.44	109.34	241.85	741.08	11.04	730.04	0.02	0.08	10.58	829	13.09	-14.28	-0.59
YF-1-12	81.07	10362.52	1.39	11.63	194.89	432.22	1024.31	39.86	984.45	0.04	0.04	1.60	762	9.52	-18.46	-3.30
YF-1-13	39.34	8659.89	0.67	4.11	113.99	146.74	518.25	13.76	504.49	0.03	0.17	66.59	835	12.84	-14.10	-0.53
YF-1-14	52.32	12087.90	2.62	16.71	251.37	639.39	609.79	16.13	593.67	0.03	0.07	65.47	707	121.13	-12.05	4.46
YF-1-15	70.66	9098.07	1.45	11.45	333.53	383.34	995.89	32.54	963.35	0.03	0.14	73.99	779	19.98	-15.07	-0.29
YF-1-16	155.37	12415.23	10.59	62.78	314.93	2316.61	1570.73	17.51	1553.22	0.01	0.61	593.83	631	338.45	-12.67	5.97
YF-1-17	74.28	10547.61	1.33	66.61	243.24	339.10	1083.88	20.48	1063.40	0.02	0.07	21.51	824	5.81	-17.24	-3.44

YF-1-18	50.08	9593.28	1.30	8.74	201.59	318.27	660.79	17.60	643.19	0.03	0.09	94.53	783	21.99	-14.51	0.17
YF-1-19	55.99	10570.61	2.46	15.89	370.26	577.53	724.98	44.51	680.47	0.07	0.11	4.34	770	26.83	-14.43	0.55
YF-1-20	54.00	11324.04	2.25	20.35	187.83	819.65	787.96	34.64	753.32	0.05	0.07	1.84	680	9.69	-22.75	-5.50
YF-2-1	86.91	10918.22	1.25	12.89	245.91	441.86	1203.99	21.53	1182.46	0.02	0.07	6.83	839	4.63	-17.33	-3.83
YF-2-2	72.19	9835.48	0.47	4.95	162.46	154.29	1093.08	32.22	1060.87	0.03	0.15	10.04	908	2.48	-16.40	-4.22
YF-2-3	62.97	10259.09	0.59	4.22	138.30	131.64	946.41	28.61	917.80	0.03	0.19	12.96	869	2.61	-17.77	-4.86
YF-2-4	105.81	11126.23	1.12	40.30	200.42	549.56	1395.53	15.23	1380.30	0.01	0.04	10.54	741	1.96	-24.25	-8.59
YF-2-5	65.56	11718.88	1.16	9.49	210.08	331.55	972.25	35.47	936.78	0.04	0.10	2.31	856	3.23	-17.68	-4.53
YF-2-6	65.67	10206.50	1.19	12.50	108.80	244.17	792.78	12.58	780.20	0.02	0.15	147.88	755	15.19	-17.20	-1.86
YF-2-7	75.01	11895.89	1.49	12.30	123.65	479.45	1010.72	9.72	1001.00	0.01	0.04	-	773	9.29	-17.99	-3.09
YF-2-8	67.85	10427.53	1.16	8.43	183.11	301.41	911.19	30.85	880.34	0.04	0.22	7.78	795	18.73	-14.55	-0.13
YF-2-9	39.88	8983.64	0.65	3.33	77.49	115.16	508.96	9.91	499.05	0.02	0.21	16.38	715	23.46	-17.67	-1.37
YF-2-10	49.34	11769.34	1.92	14.70	224.68	541.59	963.27	234.52	728.76	0.32	0.09	1.30	738	1.93	-24.47	-8.73
YF-2-11	104.59	10924.10	1.03	11.34	271.55	404.92	1428.80	26.33	1402.47	0.02	0.04	2.85	800	3.60	-19.76	-5.46
YF-2-12	44.25	11153.53	1.26	8.99	166.24	320.56	558.16	14.76	543.39	0.03	0.11	82.02	717	38.22	-15.80	0.46
YF-2-13	122.23	11673.85	3.27	25.08	215.37	874.41	1434.22	20.21	1414.01	0.01	0.07	8.30	714	21.25	-18.06	-1.74
YF-2-14	44.33	11689.81	1.50	9.03	146.55	331.21	553.78	20.17	533.61	0.04	0.23	-	768	71.22	-10.91	4.10
YF-2-15	89.84	8073.75	1.14	300.25	341.41	493.58	1396.21	54.95	1341.26	0.04	0.43	11.46	780	3.09	-21.13	-6.39
YF-2-16	51.69	11807.38	1.65	10.94	159.78	345.97	654.72	36.16	618.56	0.06	0.08	1.84	822	9.32	-15.77	-1.93
YF-2-17	63.97	11372.52	2.29	20.13	426.99	720.24	873.04	69.85	803.19	0.09	0.10	2.27	732	16.31	-18.09	-2.21
YF-2-18	49.90	9041.99	0.97	6.90	161.79	252.97	665.37	14.17	651.20	0.02	0.10	21.74	832	7.16	-16.23	-2.59
YF-2-19	72.04	11305.55	2.28	20.42	291.31	760.09	954.30	63.91	890.39	0.07	0.10	1.72	785	12.12	-16.54	-1.90
YF-2-20	112.28	11296.46	1.77	50.40	357.67	650.50	1427.90	20.06	1407.84	0.01	0.05	8.09	822	19.15	-13.26	0.58
YF-2-21	86.68	11274.94	2.25	19.62	296.66	730.02	1080.42	22.54	1057.88	0.02	0.06	4.11	741	13.04	-18.43	-2.76

Remarks: $\text{Eu}/\text{Eu}^* = (\text{Eu}_{\text{sample}}/\text{Eu}_{\text{chondrite}})/[(\text{Sm}_{\text{sample}}/\text{Sm}_{\text{chondrite}}) \times (\text{Gd}_{\text{sample}}/\text{Gd}_{\text{chondrite}})]^{0.5}$. Zircon Ti thermometer (T_{Ti}) equation according to [37], $\lg(\text{Ti}) = (5.711 \pm 0.072) - (4800 \pm 86)/T_{(\text{K})} + \lg(\alpha\text{TiO}_2) - \lg(\alpha\text{SiO}_2)$. αSiO_2 is the SiO_2 activity in the system ($\alpha\text{SiO}_2=1$), and αTiO_2 is the TiO_2 activity in the system ($\alpha\text{TiO}_2=0.6$). $\text{Ce}^{4+}/\text{Ce}^{3+}$, $\lg f(\text{O}_2)$, and FMQ were

calculated using the Geo-fo2 software.

Table S3 LA-ICP-MS U-Pb zircon data of the Yongfeng composite pluton

No.	ppm		Ratio of isotope								Age (Ma)				Concordance
	Th	U	$\frac{^{207}\text{Pb}}{^{206}\text{Pb}}$	1σ	$\frac{^{207}\text{Pb}}{^{235}\text{U}}$	1σ	$\frac{^{206}\text{Pb}}{^{238}\text{U}}$	1σ	$\frac{^{207}\text{Pb}}{^{206}\text{Pb}}$	1σ	$\frac{^{207}\text{Pb}}{^{235}\text{U}}$	1σ	$\frac{^{206}\text{Pb}}{^{238}\text{U}}$	1σ	
			^{206}Pb		^{235}U		^{238}U		^{206}Pb		^{235}U		^{238}U		
YF-1-1	146.61	201.87	0.05	0.00280	0.17	0.00908	0.02	0.00033	300	122	161	8	153	2	95%
YF-1-2	666.90	400.37	0.05	0.00202	0.17	0.00695	0.02	0.00028	287	89	163	6	155	2	94%
YF-1-3	474.87	528.76	0.06	0.00113	0.51	0.01070	0.07	0.00062	450	44	420	7	415	4	98%
YF-1-4	499.95	920.80	0.05	0.00178	0.17	0.00589	0.02	0.00023	306	78	158	5	148	1	93%
YF-1-5	163.68	232.39	0.05	0.00313	0.17	0.00997	0.02	0.00029	287	139	157	9	149	2	95%
YF-1-6	192.00	296.07	0.05	0.00286	0.17	0.00886	0.02	0.00039	367	122	163	8	152	2	92%
YF-1-7	127.12	395.98	0.07	0.00116	1.95	0.03255	0.19	0.00170	1040	31	1097	11	1125	9	97%
YF-1-8	90.15	1010.74	0.07	0.00091	1.26	0.02211	0.13	0.00169	909	60	829	10	799	10	96%
YF-1-9	169.40	512.28	0.05	0.00132	0.48	0.01175	0.06	0.00064	387	56	395	8	396	4	99%
YF-1-10	367.29	586.26	0.05	0.00193	0.17	0.00624	0.02	0.00025	220	89	156	5	152	2	97%
YF-1-11	109.34	241.85	0.05	0.00305	0.17	0.01001	0.02	0.00035	276	103	159	9	152	2	94%
YF-1-12	194.89	432.22	0.05	0.00258	0.17	0.00796	0.02	0.00032	324	111	160	7	151	2	93%
YF-1-13	113.99	146.74	0.06	0.00418	0.19	0.01251	0.02	0.00039	683	144	180	11	147	2	79%
YF-1-14	251.37	639.39	0.05	0.00169	0.16	0.00538	0.02	0.00026	161	80	152	5	152	2	99%
YF-1-15	333.53	383.34	0.05	0.00331	0.16	0.01024	0.02	0.00037	120	152	150	9	154	2	97%
YF-1-16	314.93	2316.61	0.05	0.00087	0.18	0.00330	0.03	0.00018	176	8	171	3	170	1	99%
YF-1-17	243.24	339.10	0.07	0.00135	1.61	0.03597	0.16	0.00169	946	40	972	14	980	9	99%
YF-1-18	201.59	318.27	0.05	0.00235	0.16	0.00707	0.02	0.00029	124	115	148	6	151	2	97%
YF-1-19	370.26	577.53	0.05	0.00202	0.15	0.00664	0.02	0.00025	39	100	144	6	151	2	95%
YF-1-20	187.83	819.65	0.05	0.00177	0.16	0.00600	0.02	0.00022	143	90	152	5	153	1	99%
YF-2-1	245.91	441.86	0.06	0.00289	0.19	0.00945	0.02	0.00037	480	113	173	8	152	2	87%
YF-2-2	162.46	154.29	0.05	0.00362	0.18	0.01147	0.02	0.00043	467	148	166	10	151	3	90%

YF-2-3	138.30	131.64	0.05	0.00485	0.17	0.01258	0.02	0.00064	394	197	156	11	151	4	96%
YF-2-4	200.42	549.56	0.06	0.00149	0.51	0.01404	0.07	0.00075	476	57	417	9	407	5	97%
YF-2-5	210.08	331.55	0.05	0.00236	0.17	0.00780	0.02	0.00033	345	100	162	7	151	2	93%
YF-2-6	108.80	244.17	0.05	0.00241	0.30	0.01359	0.04	0.00065	198	113	263	11	275	4	95%
YF-2-7	123.65	479.45	0.05	0.00225	0.16	0.00684	0.02	0.00029	150	107	150	6	151	2	99%
YF-2-8	183.11	301.41	0.05	0.00313	0.17	0.00975	0.02	0.00038	317	140	160	8	151	2	94%
YF-2-9	77.49	115.16	0.06	0.00607	0.18	0.01879	0.02	0.00073	417	253	167	16	149	5	88%
YF-2-10	224.68	541.59	0.05	0.00237	0.17	0.00759	0.02	0.00029	346	100	163	7	151	2	92%
YF-2-11	271.55	404.92	0.05	0.00249	0.15	0.00776	0.02	0.00030	87	119	144	7	148	2	97%
YF-2-12	166.24	320.56	0.05	0.00317	0.16	0.01049	0.02	0.00037	154	144	153	9	154	2	99%
YF-2-13	215.37	874.41	0.05	0.00201	0.19	0.00694	0.03	0.00038	346	85	177	6	165	2	92%
YF-2-14	146.55	331.21	0.05	0.00280	0.17	0.00903	0.02	0.00033	295	124	161	8	153	2	94%
YF-2-15	341.41	493.58	0.18	0.00237	11.56	0.16048	0.46	0.00391	2661	21	2569	13	2453	17	95%
YF-2-16	159.78	345.97	0.05	0.00399	0.21	0.01563	0.03	0.00048	467	168	194	13	177	3	90%
YF-2-17	426.99	720.24	0.05	0.00190	0.16	0.00602	0.02	0.00026	189	89	152	5	151	2	99%
YF-2-18	161.79	252.97	0.06	0.00474	0.17	0.01413	0.02	0.00045	454	187	159	12	144	3	89%
YF-2-19	291.31	760.09	0.05	0.00179	0.17	0.00603	0.02	0.00027	239	81	158	5	153	2	96%
YF-2-20	357.67	650.50	0.05	0.00129	0.49	0.01201	0.07	0.00076	367	54	407	8	415	5	97%
YF-2-21	296.66	730.02	0.05	0.00206	0.17	0.00705	0.02	0.00029	287	91	161	6	152	2	94%
XGml1-1	151.41	240.51	0.05	0.00118	0.18	0.00748	0.02	0.00071	322	52	164	6	153	4	93%
XGml1-2	95.16	146.49	0.05	0.00172	0.21	0.01212	0.03	0.00127	332	105	190	10	178	8	93%
XGml1-3	291.31	978.79	0.05	0.00032	0.17	0.00238	0.02	0.00031	287	13	160	2	152	2	94%
XGml1-4	72.19	52.46	0.05	0.00129	0.18	0.01131	0.03	0.00099	165	66	164	10	164	6	99%
XGml1-5	1061.1	614.12	0.05	0.00037	0.26	0.00254	0.03	0.00025	369	17	234	2	221	2	94%
XGml1-6	154.86	1475.35	0.05	0.00030	0.17	0.00188	0.02	0.00022	254	47	161	2	155	1	96%
XGml1-7	160.66	209.86	0.07	0.00055	0.99	0.00950	0.11	0.00084	831	21	701	5	662	5	94%
XGml1-8	301.65	363.18	0.05	0.00075	0.24	0.00082	0.03	0.00040	309	33	222	1	214	3	96%
XGml1-9	29.32	1250.85	0.05	0.00019	0.24	0.00131	0.03	0.00016	256	7	215	1	212	1	98%
XGml1-10	90.36	439.45	0.05	0.00021	0.17	0.00162	0.02	0.00014	198	9	157	1	155	1	98%

XGml1-11	123.46	134.60	0.16	0.00136	0.53	0.01138	0.02	0.00035	2431	14	431	8	155	2	5%
XGml1-12	136.68	225.92	0.05	0.00079	0.17	0.00290	0.02	0.00021	320	33	164	3	153	1	93%
XGml1-13	149.99	157.69	0.06	0.00095	0.18	0.00404	0.02	0.00020	417	39	171	3	154	1	89%
XGml1-14	339.10	653.66	0.05	0.00031	0.18	0.00286	0.02	0.00045	302	18	165	2	156	3	94%
XGml1-15	832.94	583.56	0.06	0.00023	1.05	0.00544	0.12	0.00070	744	7	731	3	731	4	99%
XGml1-16	170.41	127.22	0.07	0.00141	0.22	0.00207	0.02	0.00070	887	43	205	2	151	4	69%
XGml1-17	275.74	619.96	0.05	0.00110	0.17	0.00387	0.02	0.00006	261	48	159	3	152	0	95%
XGml1-18	456.08	338.56	0.07	0.00041	1.57	0.01621	0.15	0.00174	1044	11	958	6	922	10	96%
XGml1-19	235.68	490.97	0.05	0.00094	0.18	0.00320	0.02	0.00085	372	41	169	3	155	5	91%
XGml1-20	204.58	378.21	0.07	0.00044	1.01	0.03542	0.10	0.00381	1018	13	707	18	613	22	85%
XGls12-1	9.51	195.20	0.06	0.00031	0.96	0.00837	0.11	0.00081	772	11	682	4	656	5	96%
XGls12-2	167.22	1822.59	0.05	0.00028	0.26	0.00182	0.04	0.00021	261	8	237	1	235	1	99%
XGls12-3	276.66	1010.28	0.10	0.00440	2.18	0.06750	0.15	0.00475	1698	78	1174	22	915	27	75%
XGls12-4	43.31	304.52	0.07	0.00020	1.65	0.01001	0.17	0.00110	998	10	991	4	990	6	99%
XGls12-5	420.04	618.74	0.08	0.00027	2.15	0.01117	0.20	0.00117	1183	7	1164	4	1157	6	99%
XGls12-6	217.44	1127.09	0.06	0.00030	0.58	0.00364	0.07	0.00037	478	11	462	2	462	2	99%
XGls12-7	1347.7	1020.35	0.36	0.00268	3.02	0.05306	0.06	0.00071	3769	6	1413	13	377	4	-16%
XGls12-8	171.85	703.83	0.08	0.00087	1.91	0.02789	0.18	0.00097	1102	23	1086	10	1078	5	99%
XGls12-9	250.79	265.18	0.05	0.00130	0.26	0.00617	0.04	0.00102	332	56	239	5	230	6	96%
XGls12-10	391.66	300.09	0.07	0.00040	1.63	0.01164	0.16	0.00078	1047	11	983	4	956	4	97%
XGls12-11	567.27	2759.93	0.05	0.00035	0.28	0.00255	0.04	0.00014	391	8	253	2	239	1	94%
XGls12-12	132.59	321.85	0.08	0.00069	1.95	0.01545	0.18	0.00056	1117	17	1098	5	1090	3	99%
XGls12-13	243.56	357.48	0.07	0.00021	1.63	0.00514	0.16	0.00053	983	1	983	2	983	3	99%
XGls12-14	214.19	693.80	0.07	0.00030	1.34	0.01574	0.14	0.00189	883	9	864	7	860	11	99%
XGls12-15	2478.6	2615.25	0.05	0.00024	0.27	0.00189	0.04	0.00019	298	11	239	2	233	1	97%
XGls12-16	243.32	1095.16	0.05	0.00029	0.18	0.00125	0.03	0.00019	250	13	165	1	159	1	96%
XGls12-17	137.99	270.80	0.07	0.00028	1.27	0.00694	0.14	0.00076	883	8	835	3	817	4	97%
XGls12-18	368.62	565.79	0.08	0.00036	2.74	0.02856	0.24	0.00175	1298	8	1339	8	1364	9	98%
XGls12-19	411.82	386.95	0.07	0.00040	1.79	0.02766	0.18	0.00243	1035	11	1044	10	1048	13	99%

XGLs12-20	87.38	133.77	0.13	0.00026	6.42	0.02907	0.37	0.00164	2054	3	2035	4	2016	8	99%
XXGyf-1-1	224.00	344.89	0.05	0.00079	0.17	0.01222	0.02	0.00145	298	35	161	11	152	9	94%
XXGyf-1-2	147.26	1166.79	0.05	0.00020	0.39	0.00410	0.05	0.00055	409	-25	332	3	321	3	96%
XXGyf-1-3	173.40	126.88	0.05	0.00131	0.16	0.00722	0.02	0.00081	211	61	153	6	150	5	98%
XXGyf-1-4	98.74	283.10	0.05	0.00108	0.17	0.00613	0.02	0.00062	261	48	159	5	152	4	95%
XXGyf-1-5	110.19	120.17	0.05	0.00205	0.16	0.00044	0.02	0.00094	280	91	153	0	145	6	94%
XXGyf-1-6	47.01	684.79	0.05	0.00152	0.17	0.00344	0.02	0.00026	265	69	155	3	148	2	95%
XXGyf-1-7	81.50	154.40	0.12	0.00324	0.41	0.01032	0.03	0.00026	1914	49	346	7	160	2	26%
XXGyf-1-8	82.71	116.37	0.05	0.00399	0.17	0.00706	0.02	0.00085	361	168	162	6	150	5	92%
XXGyf-1-9	176.61	288.66	0.05	0.00044	0.16	0.00320	0.02	0.00059	232	20	152	3	147	4	96%
XXGyf-1-10	311.37	864.30	0.05	0.00033	0.17	0.00187	0.02	0.00023	243	12	156	2	151	1	96%
XXGyf-1-11	91.69	187.70	0.05	0.00153	0.16	0.00566	0.02	0.00027	333	73	153	5	146	2	95%
XXGyf-1-12	126.59	158.09	0.05	0.00098	0.17	0.00254	0.02	0.00082	233	72	156	2	152	5	97%
XXGyf-1-13	1249.1	5886.80	0.05	0.00059	0.17	0.00032	0.02	0.00028	261	26	157	0	150	2	95%
XXGyf-1-14	134.16	276.72	0.05	0.00096	0.17	0.00397	0.02	0.00046	365	71	162	3	149	3	91%
XXGyf-1-15	75.08	192.91	0.06	0.00204	0.20	0.00370	0.02	0.00040	769	67	188	3	146	3	74%
XXGyf-1-16	237.41	472.57	0.05	0.00147	0.16	0.00509	0.02	0.00080	309	58	154	4	145	5	93%
XXGyf-1-17	161.15	146.31	0.05	0.00369	0.16	0.01596	0.02	0.00060	211	172	151	14	147	4	97%
XXGyf-1-18	124.90	149.85	0.05	0.00098	0.16	0.01459	0.02	0.00191	257	43	151	13	144	12	95%
XXGyf-1-19	249.05	706.89	0.05	0.00034	0.16	0.00280	0.02	0.00041	333	15	153	2	146	3	95%
XXGyf-1-20	6213.7	7576.37	0.05	0.00051	0.18	0.00252	0.02	0.00028	391	20	166	2	151	2	90%

Table S4 Major (wt%), trace and rare earth (ppm) element data of the Yongfeng granite

No.	YF-1-1	YF-1-2	YF-1-3	YF-1-4	YF-1-5	YF-2-1	YF-2-2	YF-2-3	YF-2-4	YF-2-5
SiO ₂	73.28	73.20	72.48	72.57	72.80	72.97	72.62	73.21	72.41	72.60
Al ₂ O ₃	12.92	13.01	13.56	13.54	13.34	13.80	13.86	13.60	13.71	13.72
CaO	0.99	1.00	0.93	1.28	1.06	1.10	1.07	1.06	1.12	1.18
TFe ₂ O ₃	2.19	1.94	2.17	2.27	2.06	2.12	2.09	2.18	2.16	2.26
FeO	1.81	1.58	2.01	1.87	1.49	1.76	1.81	1.89	1.85	1.96
K ₂ O	4.99	5.53	5.46	5.28	5.50	5.36	5.53	5.27	5.36	5.25
MgO	0.47	0.41	0.44	0.49	0.44	0.42	0.44	0.46	0.43	0.46
MnO	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.07	0.07	0.07
Na ₂ O	3.44	3.55	3.31	3.11	3.64	3.17	3.09	3.12	3.11	3.12
P ₂ O ₅	0.15	0.16	0.15	0.14	0.16	0.15	0.16	0.17	0.16	0.16
TiO ₂	0.25	0.23	0.22	0.24	0.23	0.23	0.24	0.25	0.24	0.25
LOI	1.03	0.93	0.96	0.94	0.93	0.66	0.49	0.60	0.54	0.67
Li	40.60	26.00	47.80	116.00	25.80	102.00	103.00	76.50	109.00	119.00
Be	7.03	5.76	8.01	7.90	8.37	8.67	8.43	7.46	9.28	11.50
Mn	416.00	472.00	443.00	525.00	456.00	448.00	429.00	490.00	476.00	503.00
Co	2.81	2.63	2.69	2.95	2.62	2.55	2.65	2.86	2.79	2.80
Ni	3.23	3.13	3.30	3.05	3.08	2.96	3.02	3.01	3.63	3.58
Cu	2.93	3.39	7.18	3.60	7.84	3.62	4.36	3.36	4.08	4.24
Zn	57.10	59.40	51.60	56.90	67.10	51.70	54.80	55.10	53.30	54.00
Ga	17.50	18.50	18.80	20.30	17.90	20.00	19.50	20.00	20.00	20.50
Rb	331.00	365.00	371.00	393.00	352.00	392.00	398.00	397.00	402.00	405.00

Sr	64.00	60.60	85.70	72.60	67.70	82.10	81.80	86.70	83.30	75.70
Mo	0.35	0.34	0.63	0.66	0.25	0.70	0.78	0.81	0.89	1.00
Cd	<0.05	<0.05	0.06	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	0.05
In	0.06	0.06	0.05	0.06	<0.05	0.06	0.05	0.06	0.06	0.06
Cs	8.79	7.25	11.90	16.40	7.98	18.40	18.30	18.80	19.50	21.50
Ba	262.00	296.00	279.00	302.00	268.00	281.00	300.00	268.00	276.00	244.00
Tl	1.87	2.17	1.94	2.05	2.12	2.07	2.16	2.12	2.08	2.10
Pb	32.30	36.20	37.30	36.90	34.30	39.40	40.00	37.00	37.80	37.30
Bi	0.15	0.30	0.19	0.14	0.15	0.33	0.24	0.19	0.30	0.24
Th	30.20	33.50	31.10	33.20	32.60	33.60	34.10	36.70	33.40	31.90
U	28.50	28.50	20.50	12.30	9.53	44.90	16.30	16.40	10.40	23.80
Nb	24.70	24.90	24.50	26.50	25.70	25.10	25.00	27.60	26.20	27.70
Ta	3.67	3.70	3.66	3.62	3.69	3.50	3.70	4.11	3.69	3.71
Zr	154.00	142.00	122.00	172.00	139.00	153.00	161.00	129.00	141.00	120.00
Hf	5.30	5.07	4.35	6.01	4.92	5.20	5.83	4.64	5.25	4.18
Ti	1372	1242	1192	1348	1254	1209	1239	1353	1291	1350
W	2.66	2.39	2.36	2.56	2.94	2.92	2.28	2.01	2.25	2.25
As	1.08	1.19	1.23	1.01	0.90	1.63	1.54	1.11	1.47	1.40
V	13.50	13.40	13.20	15.00	13.50	13.40	13.60	14.60	14.00	14.60
La	38.40	41.40	38.60	42.20	41.60	41.80	42.00	45.30	40.80	39.90
Ce	82.70	89.20	82.80	91.40	89.50	89.80	92.40	97.20	91.60	88.80
Pr	9.30	10.20	9.23	10.20	10.20	10.20	10.40	11.10	10.20	9.87
Nd	34.00	37.70	31.80	36.20	37.10	37.10	37.10	40.10	36.80	35.40
Sm	7.56	8.12	7.41	8.30	8.14	8.16	8.22	9.11	8.28	8.00
Eu	0.61	0.63	0.58	0.65	0.61	0.64	0.64	0.61	0.64	0.59
Gd	5.89	6.14	5.87	7.00	6.60	6.34	6.49	7.52	6.23	6.12

Tb	0.88	0.91	0.88	1.07	0.95	0.94	0.90	1.20	0.94	0.90
Dy	4.65	4.64	4.45	6.01	4.93	4.84	4.65	6.52	4.97	4.70
Ho	0.82	0.79	0.78	1.12	0.83	0.82	0.77	1.20	0.85	0.79
Er	2.27	2.08	2.06	3.23	2.28	2.21	2.11	3.43	2.38	2.13
Tm	0.33	0.31	0.29	0.48	0.33	0.33	0.29	0.50	0.34	0.31
Yb	1.96	1.91	1.82	2.93	2.03	1.96	1.85	3.08	2.09	1.92
Lu	0.30	0.28	0.28	0.44	0.31	0.29	0.28	0.43	0.31	0.29
Y	19.40	19.70	19.30	29.20	21.10	20.40	18.90	30.40	21.10	20.20
Sc	4.47	4.39	4.07	4.57	4.33	4.43	4.24	4.45	4.39	4.43
DI	90.37	91.80	90.10	88.40	91.29	89.38	89.36	89.25	89.09	88.55
AKI	0.86	0.91	0.84	0.80	0.90	0.80	0.80	0.80	0.80	0.79
A/CNK	1.00	0.95	1.04	1.03	0.96	1.06	1.06	1.07	1.06	1.06
A/NK	1.17	1.10	1.19	1.25	1.12	1.25	1.25	1.25	1.26	1.27
K ₂ O/Na ₂ O	1.45	1.56	1.65	1.70	1.51	1.69	1.79	1.69	1.72	1.68
K ₂ O+Na ₂ O	8.43	9.08	8.77	8.39	9.14	8.53	8.62	8.39	8.47	8.37
TFe ₂ O ₃ /MgO	4.66	4.73	4.93	4.63	4.68	5.05	4.75	4.74	5.02	4.91
Rb/Sr	5.17	6.02	4.33	5.41	5.20	4.77	4.87	4.58	4.83	5.35
Rb/Ba	1.26	1.23	1.33	1.30	1.31	1.40	1.33	1.48	1.46	1.66
Rb/Nb	13.40	14.66	15.14	14.83	13.70	15.62	15.92	14.38	15.34	14.62
Zr+Nb+Ce+Y	280.80	275.80	248.60	319.10	275.30	288.30	297.30	284.20	279.90	256.70
ΣREE	189.67	204.31	186.85	211.23	205.41	205.43	208.10	227.30	206.43	199.72
LREE	172.57	187.25	170.42	188.95	187.15	187.70	190.76	203.42	188.32	182.56
HREE	17.10	17.06	16.43	22.28	18.26	17.73	17.34	23.88	18.11	17.16
LREE/HREE	10.09	10.98	10.37	8.48	10.25	10.59	11.00	8.52	10.40	10.64
(La/Yb) _N	14.05	15.55	15.21	10.33	14.70	15.30	16.28	10.55	14.00	14.91
Eu/Eu*	0.28	0.27	0.27	0.26	0.25	0.27	0.27	0.23	0.27	0.26

Ce/Ce*	1.07	1.06	1.08	1.08	1.07	1.07	1.08	1.06	1.10	1.10
T _{Zr} (°C)	780.71	767.48	763.16	791.68	765.71	784.59	789.22	770.92	777.28	763.70

Remarks: Differentiation index (DI)= Qz+Or+Ab+Ne+Lc+Kp (Qz, Or, Ab, Ne, Lc, Kp are the contents of quartz, orthoclase, albite, nepheline, leucite and kalsilite after CIPW standard mineral calculations, respectively). Alkali aluminum index (AKI)= $[n(\text{Na}_2\text{O})+n(\text{K}_2\text{O})]/[n(\text{Al}_2\text{O}_3)]$. A/CNK = $n(\text{Al}_2\text{O}_3)/[n(\text{CaO})+n(\text{Na}_2\text{O})+n(\text{K}_2\text{O})]$. Eu/Eu*= $(\text{Eu}_{\text{sample}}/\text{Eu}_{\text{chondrite}})/[(\text{Sm}_{\text{sample}}/\text{Sm}_{\text{chondrite}}) \times (\text{Gd}_{\text{sample}}/\text{Gd}_{\text{chondrite}})]^{0.5}$. Zircon saturation temperature was calculated according to [38]. $T_{\text{Zr}} = 12900/[2.95+0.85M+\ln(496000/\text{Zr}_{\text{melt}})]$, $M = \{[n(\text{Na})+n(\text{K})+2n(\text{Ca})]/[n(\text{Al}) \times n(\text{Si})]\}$ (unit: degrees Fahrenheit).

Table S5. The chemical composition of biotite from the Yongfeng granite

No.	YF-1-4- 1	YF-1-4- 2	YF-1-4- 3	YF-1-4- 4	YF-1-4- 5	YF-2-1- 1	YF-2-1- 3	YF-2-1- 4	YF-2-1- 5	YF-2-2- 1	YF-2-2- 2	YF-2-2- 3	YF-2-2- 4	YF-2-2- 5
Test results of electron probe (%)														
SiO ₂	34.84	34.59	34.56	34.21	35.06	34.95	35.05	34.83	35.00	35.16	34.80	34.05	34.96	34.27
Al ₂ O ₃	18.07	18.47	19.00	18.71	18.59	19.10	18.46	18.63	18.02	18.39	18.39	18.77	18.37	18.63
TiO ₂	2.93	2.88	3.01	2.99	2.29	2.72	2.14	2.06	1.97	2.34	2.30	3.20	3.26	2.75
TFeO	22.50	22.13	22.61	22.66	21.80	22.60	22.92	23.42	22.83	22.83	22.58	22.69	21.82	22.96
MnO	0.50	0.50	0.55	0.47	0.48	0.52	0.49	0.52	0.52	0.47	0.53	0.45	0.50	0.45
MgO	5.47	5.30	5.11	5.12	5.53	5.35	5.51	5.47	5.93	5.39	5.50	4.94	5.34	5.27
CaO	0.01	0.01	0.01	0.01	0.01	0.03	0.03	0.00	0.03	0.03	0.04	0.00	0.00	0.04
Na ₂ O	0.10	0.10	0.09	0.07	0.13	0.12	0.06	0.06	0.08	0.09	0.06	0.11	0.10	0.10
K ₂ O	10.10	10.05	10.17	10.26	10.28	10.09	10.29	10.28	10.17	10.09	10.12	10.04	10.32	10.08
F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl	0.03	0.03	0.03	0.04	0.05	0.03	0.02	0.04	0.02	0.03	0.03	0.06	0.03	0.03
Total	94.55	94.06	95.14	94.55	94.22	95.58	95.00	95.31	94.57	94.85	94.48	94.35	94.71	94.66
The number of cations calculated on the basis of 22 oxygen atoms														
Si	5.43	5.40	5.35	5.34	5.46	5.38	5.44	5.41	5.46	5.46	5.43	5.33	5.42	5.35
Al ^(IV)	2.57	2.60	2.65	2.66	2.54	2.62	2.56	2.59	2.54	2.54	2.57	2.67	2.58	2.65

Al ^(VI)	0.74	0.81	0.82	0.79	0.87	0.84	0.82	0.82	0.78	0.82	0.82	0.79	0.78	0.78
Ti	0.34	0.34	0.35	0.35	0.27	0.32	0.25	0.24	0.23	0.27	0.27	0.38	0.38	0.32
Fe ³⁺	0.41	0.41	0.41	0.40	0.39	0.41	0.39	0.37	0.37	0.41	0.40	0.41	0.41	0.40
Mn	0.07	0.07	0.07	0.06	0.06	0.07	0.06	0.07	0.07	0.06	0.07	0.06	0.06	0.06
Mg	1.27	1.23	1.18	1.19	1.28	1.23	1.28	1.27	1.38	1.25	1.28	1.15	1.23	1.23
Fe ²⁺	2.52	2.48	2.52	2.56	2.45	2.50	2.59	2.67	2.61	2.56	2.55	2.56	2.42	2.60
Na	0.03	0.03	0.03	0.02	0.04	0.04	0.02	0.02	0.02	0.03	0.02	0.03	0.03	0.03
K	2.01	2.00	2.01	2.04	2.04	1.98	2.04	2.04	2.02	2.00	2.02	2.00	2.04	2.01
Fe/(Fe+Mg)	0.70	0.70	0.71	0.71	0.69	0.70	0.70	0.71	0.68	0.70	0.70	0.72	0.70	0.71
Mg/(Fe+Mg)	0.30	0.30	0.29	0.29	0.31	0.30	0.30	0.29	0.32	0.30	0.30	0.28	0.30	0.29
TFeO/(TFeO+MgO)	0.80	0.81	0.82	0.82	0.80	0.81	0.81	0.81	0.79	0.81	0.80	0.82	0.80	0.81
lgf(O ₂)	-18.17	-18.24	-18.09	-18.08	-19.54	-18.62	-20.03	-20.33	-20.56	-19.48	-19.53	-17.75	-17.65	-18.51
T _{li} (°C)	656	653	658	658	614	641	600	591	585	616	614	669	672	645
P (kb)	3.85	4.10	3.97	4.24	4.14	3.97	3.71	3.80	3.84	3.66	3.73	3.96	3.64	3.86
H (km)	14.00	14.93	14.45	15.41	15.06	14.42	13.49	13.83	13.97	13.33	13.55	14.39	13.23	14.04

(continued)

No.	YF-2-5-1	YF-2-5-2	YF-2-5-3	YF-2-5-4	YF-2-5-5	YF-2-4-1	YF-2-4-2	YF-2-4-3	YF-2-4-4	YF-2-4-5	YF-2-3-1	YF-2-3-2	YF-2-3-3	YF-2-3-4
Test results of electron probe (%)														
SiO ₂	34.30	34.11	34.46	34.47	34.64	35.11	34.60	34.69	34.59	34.11	34.33	34.52	34.70	34.78
Al ₂ O ₃	18.47	18.15	18.81	19.04	18.80	19.05	19.04	19.12	19.26	18.71	18.49	18.63	19.03	18.95

TiO ₂	3.24	2.52	2.44	2.24	2.86	3.14	2.95	2.10	2.38	2.03	3.05	3.15	2.65	3.44
TFeO	22.37	23.77	22.95	22.88	22.59	21.43	22.01	22.47	22.38	23.91	22.95	22.74	22.40	22.48
MnO	0.51	0.54	0.51	0.49	0.58	0.43	0.56	0.55	0.55	0.55	0.51	0.49	0.50	0.49
MgO	4.96	5.12	5.18	4.91	5.19	4.93	5.08	5.24	4.91	5.53	5.16	5.32	5.03	5.06
CaO	0.03	0.01	0.01	0.02	0.03	0.03	0.03	0.02	0.02	0.01	0.03	0.02	0.00	0.00
Na ₂ O	0.09	0.08	0.09	0.15	0.07	0.08	0.11	0.09	0.09	0.05	0.15	0.13	0.17	0.15
K ₂ O	10.07	9.91	10.19	10.16	10.21	10.01	10.05	10.11	10.17	9.19	10.06	10.15	10.04	10.11
F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00
Cl	0.03	0.03	0.02	0.03	0.04	0.03	0.03	0.03	0.04	0.02	0.03	0.04	0.03	0.04
Total	94.07	94.25	94.68	94.40	95.04	94.24	94.49	94.42	94.40	94.63	94.80	95.20	94.55	95.53
The number of cations calculated on the basis of 22 oxygen atoms														
Si	5.37	5.37	5.38	5.39	5.37	5.43	5.38	5.40	5.39	5.38	5.35	5.35	5.39	5.35
Al ^(IV)	2.63	2.63	2.62	2.61	2.63	2.57	2.62	2.60	2.61	2.62	2.65	2.65	2.61	2.65
Al ^(VI)	0.78	0.74	0.83	0.90	0.81	0.91	0.86	0.92	0.93	0.85	0.75	0.75	0.88	0.79
Ti	0.38	0.30	0.29	0.26	0.33	0.37	0.34	0.25	0.28	0.24	0.36	0.37	0.31	0.40
Fe ³⁺	0.42	0.39	0.39	0.39	0.41	0.44	0.42	0.40	0.41	0.42	0.40	0.40	0.41	0.42
Mn	0.07	0.07	0.07	0.07	0.08	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.07
Mg	1.16	1.20	1.21	1.14	1.20	1.14	1.18	1.22	1.14	1.30	1.20	1.23	1.17	1.16
Fe ²⁺	2.51	2.74	2.60	2.60	2.52	2.33	2.44	2.53	2.51	2.74	2.59	2.54	2.50	2.47
Na	0.03	0.02	0.03	0.05	0.02	0.02	0.03	0.03	0.03	0.02	0.04	0.04	0.05	0.05
K	2.01	1.99	2.03	2.03	2.02	1.98	1.99	2.01	2.02	1.85	2.00	2.01	1.99	1.99
Fe/(Fe+Mg)	0.72	0.72	0.71	0.72	0.71	0.71	0.71	0.71	0.72	0.71	0.71	0.71	0.71	0.71
Mg/(Fe+Mg)	0.28	0.28	0.29	0.28	0.29	0.29	0.29	0.29	0.28	0.29	0.29	0.29	0.29	0.29
TFeO/(TFeO+MgO)	0.82	0.82	0.82	0.82	0.81	0.81	0.81	0.81	0.82	0.81	0.82	0.81	0.82	0.82
lgf(O ₂)	-17.68	-18.98	-19.20	-19.77	-18.32	-17.87	-18.16	-20.17	-19.38	-20.35	-17.98	-17.85	-18.75	-17.48
T _{Ti} (°C)	671	631	624	607	651	665	656	596	619	591	662	666	638	678

P (kb)	3.80	3.68	3.95	4.10	3.88	4.00	4.36	4.11	4.19	4.00	3.76	3.78	4.03	3.88
H (km)	13.81	13.37	14.35	14.91	14.12	14.54	15.86	14.94	15.23	14.55	13.68	13.75	14.65	14.13

Remarks: The crystallization temperature (T_{Ti}) of biotite was calculated according to the formula: $T = \{[\ln(Ti) + 2.3594 + 1.7283 \times (X_{Mg})^3] / (4.6482 \times 10^{-9})\}^{0.333}$, $X_{Mg} = Mg / (Mg + TFe)$ ([92]). The $\lg f(O_2)$ was calculated according to the formula: $\lg f(O_2) = 10.9 - 27000 / T_{(K)}$, ($T_{(K)}$ is the crystallization temperature of biotite, [46]).