

Table S4. Geochemical compositions of Permian granitoids in this study

Sample	18ST60-1	18ST60-2	18ST60-3	18ST64-1	18ST64-2	18ST64-3	19ST17-1	19ST17-2	19ST17-3	20ST78-1	20ST78-2	20ST78-3	20ST93-1	20ST93-2	20ST93-3
Al ₂ O ₃ (%)	14.07	13.83	13.74	13.83	13.97	14.02	13.42	13.17	13.62	13.98	13.59	13.98	15.56	15.48	15.42
CaO	1.38	1.40	1.48	1.48	1.40	1.50	1.21	1.26	1.29	1.04	1.48	1.70	2.65	2.18	2.19
TFe ₂ O ₃	3.35	3.38	3.38	3.43	3.43	3.47	3.01	3.02	3.21	3.44	3.50	3.29	3.71	3.70	3.81
K ₂ O	5.09	5.00	4.72	5.08	4.84	4.91	5.18	5.04	5.17	4.91	5.30	5.57	4.01	4.22	4.23
MgO	0.46	0.45	0.44	0.46	0.48	0.45	0.10	0.10	0.12	0.13	0.28	0.12	1.51	1.55	1.54
MnO	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.02	0.04	0.04	0.05	0.06	0.06
Na ₂ O	3.71	3.70	3.81	3.43	3.67	3.56	3.44	3.40	3.48	3.59	3.30	3.39	3.30	3.33	3.62
P ₂ O ₅	0.15	0.15	0.15	0.15	0.14	0.15	0.04	0.05	0.05	0.13	0.11	0.10	0.27	0.28	0.30
SiO ₂	69.31	69.37	69.59	69.69	69.87	69.29	72.86	72.18	71.18	70.13	69.93	69.25	66.81	66.50	65.71
TiO ₂	0.45	0.45	0.45	0.45	0.45	0.46	0.21	0.21	0.23	0.44	0.38	0.35	0.63	0.63	0.66
LOI 1000	1.24	1.30	1.30	1.26	1.23	1.35	0.70	0.60	0.74	1.62	1.60	1.74	1.25	1.87	1.90
Ba (ppm)	850	851	665	851	769	854	625	735	735	925	839	868.0	750	800	800
Ce	114.0	120.0	120.5	118.0	118.0	121.0	201	203	228	144.8	198.3	160.0	109.0	96.3	111.5
Cs	7.98	7.79	8.09	7.28	7.08	7.44	9.17	7.86	9.30	1.31	1.76	1.54	11.30	4.30	4.20
Dy	7.25	7.66	7.69	7.33	7.33	7.72	15.90	16.50	18.40	8.90	9.22	8.21	2.90	2.28	2.72
Er	4.44	4.77	4.75	4.60	4.31	4.44	9.69	9.98	10.90	4.56	4.50	4.21	1.44	1.09	1.32
Eu	1.46	1.37	1.27	1.40	1.39	1.50	1.51	1.65	1.69	2.02	1.94	1.85	1.40	1.17	1.32
Ga	25.3	25.2	24.4	24.7	24.6	25.4	27.6	27.0	30.1	23.5	23.1	22.7	23.4	22.9	23.6
Gd	8.98	9.22	9.26	9.53	9.15	9.97	15.55	16.10	18.85	10.35	11.23	9.51	4.67	3.62	4.29
Hf	8.7	9.2	9.1	8.9	9.1	9.3	11.3	10.9	12.0	10.9	9.4	8.2	6.3	5.7	6.6
Ho	1.53	1.70	1.56	1.58	1.54	1.64	3.24	3.39	3.73	1.68	1.69	1.55	0.52	0.42	0.47
La	53.1	56.0	55.5	55.6	55.1	56.6	97.3	96.7	114.5	69.7	101.5	82.6	57.7	43.9	55.4
Lu	0.58	0.57	0.66	0.60	0.61	0.63	1.30	1.26	1.39	0.64	0.62	0.62	0.16	0.16	0.19
Nb	21.8	22.5	22.9	22.0	21.8	22.0	39.6	41.6	44.3	20.1	18.3	17.1	14.0	12.1	13.5
Nd	48.5	49.9	50.6	49.3	49.2	50.4	87.4	87.8	99.4	66.7	82.6	69.0	44.3	35.3	43.8
Pr	12.70	13.25	13.25	13.35	12.90	13.65	23.1	23.4	26.8	17.65	23.3	19.80	12.35	9.79	12.25
Rb	197.0	198.0	190.5	210	203	205	282	263	300	130.0	154.0	159.0	216	232	238
Sm	10.05	10.35	10.20	10.80	9.88	10.65	17.75	18.65	20.4	12.55	14.28	12.35	7.33	5.71	6.92
Sn	7.80	8.00	7.70	3.40	3.50	3.40	8.00	7.00	8.00	2.60	2.70	2.40	6.00	5.00	7.00

Sr	143.0	130.5	115.5	116.5	122.0	126.0	70.5	74.7	75.6	112.0	133.5	131.0	351	339	317
Ta	1.42	1.49	1.52	1.53	1.47	1.61	2.8	2.4	3.0	0.98	0.96	0.90	1.2	0.9	0.9
Tb	1.40	1.45	1.51	1.41	1.31	1.40	2.68	2.79	3.21	1.56	1.66	1.44	0.62	0.48	0.56
Th	19.55	20.1	20.5	19.65	20.3	19.95	28.7	34.2	38.6	17.20	24.6	21.8	27.5	25.4	26.8
Tm	0.61	0.63	0.68	0.61	0.62	0.63	1.41	1.42	1.56	0.66	0.63	0.61	0.19	0.15	0.17
U	5.29	5.22	5.63	5.33	4.99	5.37	6.04	6.97	8.20	2.08	2.88	1.70	2.50	2.08	2.60
Y	40.8	42.9	43.8	43.2	41.6	43.2	94.4	95.6	106.0	46.0	46.6	44.4	14.2	11.5	12.9
Yb	3.62	3.79	4.06	4.02	3.93	4.03	8.92	8.57	9.62	4.22	3.98	4.07	1.09	1.02	1.09
Zr	341	357	357	351	340	366	428	408	424	473	399	350	261	245	273
K ₂ O+Na ₂ O	8.80	8.70	8.53	8.51	8.51	8.47	8.62	8.44	8.65	8.50	8.60	8.96	7.31	7.55	7.85
K ₂ O/Na ₂ O	1.37	1.35	1.24	1.48	1.32	1.38	1.51	1.48	1.49	1.37	1.61	1.64	1.22	1.27	1.17
(La/Sm) _N	3.4	3.5	3.5	3.3	3.6	3.4	3.5	3.3	3.6	3.6	4.6	4.3	5.1	5.0	5.2
(La/Yb) _N	10.5	10.6	9.8	9.9	10.1	10.1	7.8	8.1	8.5	11.8	18.3	14.6	38.0	30.9	36.5
Eu/Eu [*]	0.47	0.43	0.40	0.42	0.45	0.45	0.28	0.29	0.26	0.54	0.47	0.52	0.73	0.79	0.74

