

Table 2. Major and trace element compositions of Lengjimanda plate of the Longjiang formation volcanic rocks.

Sample	TWG01	TWG01	TWG01	TWG01	TWG01	TWG02	TWG02	TWG02	TWG02	TWG02	TWG02	TWG04	TWG04	
	YQ1	YQ2	YQ3	YQ4	YQ5	YQ1	YQ2	YQ3	YQ4	YQ5	YQ6	YQ1	YQ2	
Lithology	Trachyandesite					Trachyte trachydacite					Trachyandesite			
Major elements (wt%)														
SiO ₂	60.44	60.59	60.13	61.11	60.42	65.76	66.28	65.38	65.68	65.66	66.23	61.24	61.70	
TiO ₂	1.09	1.09	1.11	1.09	1.07	0.63	0.60	0.62	0.59	0.62	0.61	0.84	0.83	
Al ₂ O ₃	16.70	16.60	16.95	16.57	16.75	16.94	17.08	16.95	17.10	16.97	16.93	17.13	17.11	
Fe ₂ O ₃ ^T	7.37	7.59	7.35	7.37	7.40	4.12	3.90	4.22	4.00	4.12	4.05	6.49	6.42	
MnO	0.10	0.10	0.11	0.12	0.10	0.08	0.06	0.07	0.07	0.10	0.06	0.11	0.10	
MgO	2.17	2.02	2.07	1.92	2.08	1.11	1.18	1.25	1.04	0.85	0.99	2.22	2.22	
CaO	4.12	4.31	4.48	4.31	4.32	3.26	2.54	3.42	3.24	3.20	3.11	5.01	4.53	
Na ₂ O	4.66	4.51	4.80	4.76	4.67	4.39	4.15	4.40	4.59	4.66	4.53	3.97	4.23	
K ₂ O	2.99	2.85	2.63	2.42	2.86	3.55	4.04	3.52	3.51	3.62	3.37	2.92	2.77	
P ₂ O ₅	2.99	2.85	2.63	2.42	2.86	3.55	4.04	3.52	3.51	3.62	3.37	2.92	2.77	
LOI	1.63	1.39	1.63	1.54	1.42	2.08	2.46	1.48	1.43	1.73	1.66	1.58	1.39	
Total	98.31	98.76	98.44	98.24	98.61	97.26	97.40	98.42	98.24	98.28	98.41	98.30	98.03	
Na ₂ O/K ₂ O	1.56	1.58	1.82	1.96	1.63	1.24	1.03	1.25	1.31	1.29	1.34	1.36	1.53	
A/NK	1.53	1.58	1.58	1.59	1.55	1.53	1.52	1.53	1.50	1.46	1.52	1.77	1.72	
A/CNK	0.91	0.90	0.90	0.91	0.90	1.00	1.08	0.98	0.99	0.97	1.01	0.91	0.94	
Trace elements (ppm)														
Sc	19.20	21.93	26.67	24.39	22.56	10.49	14.97	13.90	14.16	15.76	16.25	11.74	11.13	
V	96.45	91.59	99.92	107.02	97.75	34.14	33.49	33.52	31.59	33.71	34.96	77.86	76.55	
Cr	22.14	16.36	15.62	21.94	29.67	17.17	9.28	13.93	16.44	12.73	11.58	11.75	12.43	
Co	27.50	27.90	30.65	27.42	30.30	11.91	12.92	12.19	12.99	10.98	12.03	17.59	16.50	
Ni	19.70	19.47	22.90	20.40	23.87	12.20	12.03	13.22	13.78	11.87	18.08	5.98	3.79	

Ga	23.28	23.44	22.20	23.31	22.84	20.05	20.58	21.64	20.34	20.47	20.75	18.47	18.59
Rb	61.53	62.45	61.01	54.50	61.37	90.81	107.72	93.00	97.73	95.13	88.03	72.54	69.80
Y	55.62	61.80	63.96	55.58	67.30	45.66	48.02	46.42	46.84	42.65	47.50	18.88	17.13
Zr	251.11	250.60	259.72	247.95	252.33	235.48	238.68	235.88	238.24	238.13	239.84	203.48	204.37
Nb	10.11	10.49	10.09	9.72	10.50	10.10	10.33	9.86	10.16	10.21	9.56	7.63	6.89
Ba	788.13	823.75	827.68	610.15	777.25	907.84	945.25	893.44	865.27	908.96	894.87	774.71	736.84
La	56.61	59.28	60.62	55.31	58.54	51.26	53.97	52.85	54.13	51.15	54.58	21.47	20.40
Ce	121.92	122.72	133.76	123.23	122.00	109.67	115.47	112.28	115.53	103.93	114.63	44.60	41.55
Nd	67.34	71.49	73.50	67.18	74.14	54.61	58.06	56.34	57.07	53.08	57.78	23.94	22.75
Sm	13.83	14.75	15.13	14.01	15.40	10.80	11.12	10.92	10.63	10.51	10.92	4.93	4.81
Eu	2.43	2.51	2.52	2.17	2.51	2.32	2.46	2.33	2.39	2.24	2.36	1.24	1.24
Gd	9.52	10.46	10.50	9.61	10.37	8.18	8.46	8.25	8.54	7.41	8.43	3.96	3.61
Tb	0.93	0.98	1.02	0.90	1.04	0.73	0.75	0.73	0.76	0.75	0.75	0.53	0.53
Dy	7.36	7.89	8.00	7.14	8.23	5.77	5.94	5.79	5.83	5.84	6.00	3.21	3.16
Ho	1.08	1.20	1.17	1.08	1.13	0.87	0.89	0.88	0.87	0.81	0.89	0.63	0.57
Er	3.35	3.61	3.62	3.38	3.59	2.76	2.95	2.89	2.97	2.58	2.93	2.03	2.00
Tm	0.42	0.45	0.45	0.43	0.46	0.37	0.39	0.39	0.39	0.36	0.36	0.28	0.26
Yb	2.84	3.02	3.26	2.92	3.02	2.51	2.59	2.67	2.55	2.56	2.60	1.83	1.83
Lu	0.40	0.46	0.46	0.42	0.45	0.37	0.39	0.40	0.40	0.34	0.39	0.29	0.27
Ta	0.98	0.99	1.15	1.02	1.15	1.20	1.07	1.07	0.95	1.08	1.15	0.54	0.38
Th	5.06	4.82	5.01	4.56	4.85	4.56	5.16	5.40	5.60	6.82	4.74	7.15	6.72
U	2.32	2.36	2.52	2.41	2.30	2.16	2.29	2.41	2.46	2.03	2.47	1.60	1.48
ΣREE	304.68	316.19	331.91	304.35	319.59	264.42	278.26	271.12	276.64	255.04	277.41	114.82	108.51
LREE	278.78	288.13	303.43	278.48	291.30	242.86	255.90	249.12	254.33	234.39	255.06	102.07	96.27
HREE	25.90	28.06	28.48	25.87	28.29	21.56	22.36	22.00	22.31	20.65	22.35	12.75	12.24
LREE/HREE	10.77	10.27	10.65	10.76	10.30	11.27	11.44	11.32	11.40	11.35	11.41	8.01	7.86

La ₂ /Yb ₂	14.31	14.08	13.35	13.59	13.89	14.68	14.92	14.18	15.23	14.31	15.05	8.42	8.00
δEu	0.61	0.59	0.58	0.54	0.57	0.73	0.74	0.72	0.74	0.74	0.73	0.83	0.87
δCe	0.96	0.93	0.98	0.99	0.90	0.98	0.98	0.98	0.99	0.95	0.97	0.96	0.94

Table 2 Continuation

Sample	TWG04	TWG04	TWG04	TWG05	TWG05	TWG05	TWG05	TWG05	TWG06	TWG06	TWG06	TWG06	TWG06
	YQ3	YQ4	YQ5	YQ1	YQ2	YQ3	YQ4	YQ5	YQ1	YQ2	YQ3	YQ4	YQ5
Lithology	Trachyandesite			Trachyte trachydacite					Trachyandesite				
Major elements (wt%)													
SiO ₂	61.01	61.28	62.42	65.12	65.59	66.19	65.92	65.97	58.83	60.76	62.74	61.64	62.87
TiO ₂	0.85	0.83	0.82	0.61	0.58	0.55	0.56	0.58	0.88	0.88	0.83	0.84	0.81
Al ₂ O ₃	17.07	17.09	16.49	16.54	16.26	16.23	16.23	16.29	18.07	17.34	16.42	16.66	16.23
Fe ₂ O ₃ ^T	6.53	6.39	6.50	4.91	4.77	4.43	4.71	4.69	6.56	6.73	6.40	6.57	6.30
MnO	0.11	0.11	0.09	0.08	0.09	0.08	0.09	0.09	0.10	0.10	0.10	0.09	0.09
MgO	2.46	2.33	1.99	1.58	1.31	1.33	1.32	1.47	3.27	2.82	2.32	2.50	2.40
CaO	5.22	5.08	3.78	3.06	2.48	2.74	2.43	2.93	4.68	3.94	4.08	4.11	4.21
Na ₂ O	3.79	4.00	4.88	4.38	5.07	4.87	4.90	4.33	3.38	4.16	4.85	4.34	3.00
K ₂ O	2.89	2.87	2.93	3.70	3.86	3.55	3.80	3.63	3.95	3.04	2.05	3.02	3.82
P ₂ O ₅	2.89	2.87	2.93	3.70	3.86	3.55	3.80	3.63	3.95	3.04	2.05	3.02	3.82
LOI	1.48	1.32	1.57	1.51	1.45	1.55	1.49	1.68	3.34	2.47	1.94	2.37	3.04
Total	98.14	98.27	98.04	98.57	98.52	97.89	98.10	98.48	96.38	96.93	97.97	97.51	96.76
Na ₂ O/K ₂ O	1.31	1.39	1.66	1.18	1.32	1.37	1.29	1.19	0.86	1.37	2.37	1.44	0.79
A/NK	1.82	1.76	1.47	1.47	1.30	1.37	1.33	1.47	1.83	1.71	1.61	1.60	1.79
A/CNK	0.90	0.90	0.91	0.98	0.95	0.96	0.98	0.99	0.98	1.00	0.93	0.93	0.97

Sc	10.93	11.70	11.34	8.61	7.68	7.82	7.92	8.45	12.82	13.00	12.32	13.00	12.33
V	83.90	78.07	72.74	50.22	42.42	44.10	47.06	44.66	70.84	75.19	79.00	73.99	67.90
Cr	10.58	9.72	8.18	9.33	6.68	7.55	4.60	6.97	8.97	8.98	9.61	8.25	5.87
Co	15.25	16.36	15.20	10.76	9.22	9.84	9.69	9.92	17.42	18.16	16.67	17.38	16.94
Ni	4.87	4.10	3.04	0.85	0.12	1.61	0.66	0.22	4.58	4.52	3.82	4.00	3.91
Ga	18.61	19.24	17.81	17.63	17.54	17.75	19.43	17.34	18.49	18.50	16.45	16.71	15.09
Rb	70.28	70.83	73.37	98.83	97.18	91.25	99.49	95.51	88.08	71.83	40.45	70.13	88.08
Y	16.73	18.27	17.86	18.62	17.52	18.33	17.79	18.19	15.67	14.79	14.90	15.78	15.66
Zr	201.17	200.88	191.20	258.32	272.94	272.23	273.57	269.53	192.03	193.80	184.57	182.28	175.72
Nb	6.84	6.50	7.07	8.31	8.75	8.92	8.20	7.92	6.78	6.77	6.90	7.37	6.53
Ba	676.71	698.50	795.31	932.24	1000.00	1000.00	959.58	961.40	1100.00	866.52	741.55	808.76	110.00
La	19.32	20.50	20.55	23.03	22.45	23.82	23.41	23.46	20.52	20.16	19.88	20.24	19.21
Ce	40.38	43.01	42.20	46.33	47.94	48.45	47.40	48.49	43.54	42.19	41.22	42.74	40.82
Nd	21.79	23.46	23.06	23.48	23.08	23.61	23.25	23.61	23.28	23.36	22.18	23.21	22.28
Sm	4.37	4.86	4.64	4.48	4.52	4.54	4.52	4.49	4.74	4.57	4.55	4.65	4.60
Eu	1.16	1.08	1.20	1.15	1.13	1.17	1.08	1.10	1.19	1.24	1.17	1.11	1.02
Gd	3.62	3.83	3.75	3.63	3.55	3.56	3.46	3.53	3.77	3.55	3.64	3.72	3.62
Tb	0.49	0.54	0.53	0.50	0.51	0.50	0.50	0.50	0.52	0.49	0.50	0.52	0.50
Dy	2.88	3.10	3.10	3.04	3.02	2.97	2.92	2.90	2.86	2.98	2.71	2.85	2.76
Ho	0.56	0.60	0.61	0.60	0.55	0.60	0.56	0.59	0.53	0.49	0.50	0.52	0.52
Er	1.87	2.00	1.98	2.02	1.97	2.00	2.00	2.01	1.67	1.57	1.56	1.65	1.63
Tm	0.26	0.28	0.27	0.29	0.30	0.29	0.28	0.30	0.22	0.19	0.21	0.21	0.22
Yb	1.72	1.84	1.83	1.98	1.98	2.03	1.89	1.98	1.39	1.25	1.29	1.34	1.35
Lu	0.26	0.28	0.28	0.31	0.29	0.32	0.30	0.31	0.20	0.18	0.18	0.19	0.19
Ta	0.35	0.51	0.46	0.47	0.48	0.70	0.38	0.42	0.40	0.41	0.34	0.38	0.33
Th	6.21	6.35	6.44	7.62	8.53	8.17	8.22	8.17	4.62	4.11	3.77	4.30	4.19

U	1.51	1.58	1.47	1.85	1.90	1.99	1.91	1.99	1.38	1.18	1.48	1.43	1.46
ΣREE	103.99	111.17	109.72	116.90	117.05	119.99	117.61	119.36	110.18	108.21	105.04	108.57	104.15
LREE	92.34	98.68	97.36	104.52	104.89	107.71	105.69	107.25	99.03	97.51	94.46	97.58	93.37
HREE	11.66	12.49	12.36	12.38	12.16	12.28	11.92	12.11	11.16	10.70	10.58	10.99	10.78
LREE/HREE	7.92	7.90	7.88	8.44	8.62	8.77	8.87	8.86	8.88	9.11	8.93	8.87	8.66
La _N /Yb _N	8.05	7.98	8.06	8.33	8.15	8.42	8.89	8.52	10.58	11.53	11.04	10.86	10.22
δEu	0.86	0.74	0.85	0.84	0.83	0.86	0.80	0.82	0.83	0.91	0.85	0.79	0.74
δCe	0.96	0.95	0.94	0.94	1.01	0.96	0.95	0.97	0.97	0.93	0.95	0.97	0.96
