

Table S2. REE concentrations of zircons from the fuchsite quartzite in Lulong area

Spot. No	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	ΣREE	LREE/ HREE	(Gd/Yb) _N	Eu _N /Eu _N *	Ce _N /Ce _N *
20JD03-01	38.19	47.13	45.37	53.59	132.84	68.56	310.90	508.03	798.90	1264.29	1829.13	2542.11	3568.94	4197.15	1469.23	0.07	0.09	0.08	1.13
20JD03-03	9.58	32.69	17.07	22.30	30.81	14.69	36.88	58.17	95.04	163.74	276.88	512.15	817.52	1083.74	296.46	0.15	0.05	0.11	2.45
20JD03-04	20.04	36.66	26.62	34.77	83.11	30.91	224.72	413.02	740.37	1292.31	1905.19	2569.23	3910.62	3993.50	1468.08	0.04	0.06	0.05	1.57
20JD03-05	0.05	16.49	1.10	1.55	13.45	3.66	46.83	95.29	192.20	352.56	512.94	778.54	1239.07	1375.20	427.04	0.03	0.04	0.03	28.72
20JD03-06	2.38	54.70	24.03	40.77	75.95	76.55	126.68	170.64	253.46	358.24	505.38	680.57	1035.16	1155.28	476.53	0.17	0.12	0.19	4.14
20JD03-07	1.06	30.08	8.06	23.68	87.97	44.40	263.12	435.18	775.57	1420.70	2072.13	2531.58	3533.17	4060.16	1445.00	0.03	0.07	0.06	6.59
20JD03-08	5.22	67.46	35.34	61.55	86.15	65.19	91.21	117.17	156.95	242.67	371.50	561.94	945.09	1163.01	418.75	0.28	0.10	0.18	3.33
20JD03-09	12.28	63.41	50.65	75.10	142.77	135.52	142.31	206.93	263.01	367.95	520.31	648.99	1029.75	1205.69	524.87	0.26	0.14	0.24	2.02
20JD03-10	9.83	69.61	18.00	24.09	59.39	36.77	123.17	229.09	382.72	640.11	955.00	1497.17	2288.76	2793.50	857.41	0.09	0.05	0.10	5.00
20JD03-11	0.17	17.80	0.10	0.60	7.63	4.30	29.10	68.42	115.04	195.05	313.56	456.28	686.15	842.68	252.45	0.05	0.04	0.06	132.12
20JD03-13	121.35	312.14	249.68	281.14	218.04	174.78	257.84	403.88	640.33	1085.71	1635.00	2289.07	3450.75	3910.16	1666.45	0.33	0.07	0.18	1.68
20JD03-14	10.72	86.66	34.48	55.23	135.27	126.47	189.05	252.91	324.51	404.03	500.88	644.94	890.62	944.31	522.57	0.27	0.21	0.19	3.83
20JD03-15	5.27	21.92	17.67	15.08	30.74	46.00	37.34	66.20	83.94	129.12	207.50	358.30	663.54	773.17	235.78	0.15	0.06	0.34	1.91
20JD03-16	0.03	14.83	0.57	2.23	11.96	6.73	72.91	143.49	280.73	526.19	807.56	1129.55	1671.93	1932.11	603.62	0.02	0.04	0.04	49.31
20JD03-17	27.55	95.84	70.26	96.67	113.72	86.32	132.91	154.29	193.21	300.55	489.56	744.13	1181.68	1500.00	557.49	0.33	0.11	0.18	1.96
20JD03-18	1.35	27.03	10.29	16.43	49.86	44.23	87.09	145.43	247.48	389.56	591.75	889.07	1462.48	1761.38	535.38	0.07	0.06	0.16	4.65
20JD03-19	2.58	80.96	36.42	75.30	131.96	84.72	193.97	265.37	432.20	663.00	850.63	1263.97	1982.86	1882.11	835.89	0.16	0.10	0.13	4.15
20JD03-20	1.71	14.75	2.48	8.53	34.05	18.95	133.42	237.67	402.24	630.59	968.69	1286.64	1844.41	2132.11	724.36	0.03	0.07	0.06	7.04
20JD03-21	26.54	92.74	64.12	88.51	193.18	69.63	361.56	554.85	767.93	1105.31	1457.56	1953.85	2708.39	2788.21	1269.40	0.13	0.13	0.06	2.05
20JD03-22	0.19	13.47	0.58	2.10	13.78	7.34	80.80	175.90	336.34	606.23	932.25	1249.39	1859.94	2142.68	682.22	0.02	0.04	0.04	35.25
20JD03-23	10.55	79.54	54.53	94.68	155.07	174.42	200.35	325.48	494.67	810.81	1157.50	1591.90	2285.09	2584.55	1005.94	0.15	0.09	0.25	2.44
20JD03-24	141.60	346.59	243.86	266.61	250.81	138.37	363.62	523.55	631.34	837.36	1068.50	1452.23	2042.80	2335.77	1320.87	0.49	0.18	0.11	1.80
20JD03-25	4.85	15.84	4.95	11.73	62.97	33.04	223.32	417.17	770.33	1378.75	1960.94	2517.41	3572.42	3924.39	1399.77	0.02	0.06	0.06	3.23
20JD03-26	2.25	33.46	8.17	19.65	62.70	42.10	127.44	263.71	465.85	800.18	1217.94	1736.03	2610.81	2858.54	964.01	0.05	0.05	0.11	6.42
20JD03-27	1.43	22.17	4.46	11.05	35.88	20.57	117.54	239.61	451.26	815.20	1221.88	1779.76	2509.63	2893.09	928.10	0.03	0.05	0.07	7.53
20JD03-28	1.12	32.06	3.87	8.53	38.78	12.70	154.87	292.80	512.32	893.22	1358.88	1830.77	2713.79	3115.85	1023.03	0.03	0.06	0.03	12.86
20JD03-29	29.07	75.95	44.07	40.02	53.24	37.30	103.12	175.07	266.42	454.58	725.44	1117.81	1730.68	2241.46	680.47	0.14	0.06	0.12	2.08
20JD03-30	14.60	63.13	31.47	42.19	73.45	38.72	148.19	237.12	374.39	639.01	987.25	1372.06	2110.81	2492.28	835.45	0.10	0.07	0.09	2.74
20JD03-31	21.52	181.24	128.66	209.30	482.70	353.29	441.11	477.84	532.60	665.93	877.75	1116.60	1752.92	2130.89	1090.19	0.41	0.25	0.19	2.41

20JD03-32	10118.44	4880.78	4621.34	3314.70	1162.91	304.80	444.32	452.08	475.00	647.99	960.63	1330.36	2083.42	2149.19	8354.77	9.04	0.21	0.09	0.66
20JD03-33	0.30	30.03	13.65	20.22	45.61	64.65	84.57	150.14	219.19	371.06	578.19	857.89	1270.62	1634.96	494.30	0.09	0.07	0.25	4.31
20JD03-34	235.06	506.75	543.00	573.83	1187.30	646.89	1347.14	1862.60	2250.33	2610.44	3225.81	3817.41	4800.81	4707.32	3421.70	0.35	0.28	0.13	1.30
20JD03-35	9.24	53.34	42.89	55.86	57.43	60.04	94.02	167.87	272.24	508.42	814.50	1268.02	2104.66	2647.97	761.41	0.11	0.04	0.20	2.05
20JD03-36	22.15	132.23	135.02	173.63	292.09	257.55	305.03	459.83	671.95	1075.82	1599.38	2122.67	3005.78	3447.56	1414.33	0.20	0.10	0.22	1.68
20JD03-37	0.74	12.97	0.91	2.45	13.65	9.47	61.86	109.42	227.32	433.33	693.88	1004.45	1498.26	2010.16	534.22	0.02	0.04	0.06	15.65
20JD03-38	52.36	325.74	367.24	568.47	1386.76	593.07	1656.23	2048.48	1752.72	1350.92	1108.06	1049.80	1488.88	1762.20	2139.34	0.53	1.11	0.10	1.55
20JD03-39	26.58	143.90	75.22	53.30	58.45	46.00	130.30	206.37	349.63	610.44	1014.25	1421.46	2192.92	2637.80	905.15	0.18	0.06	0.12	2.83
20JD03-40	30.30	58.81	27.48	27.83	52.36	36.41	138.79	234.90	405.85	692.67	1139.31	1614.17	2451.18	2846.34	928.88	0.08	0.06	0.10	2.04
20JD03-41	16.16	46.00	28.34	24.22	29.53	36.23	86.63	185.87	344.80	614.47	957.75	1336.44	2075.16	2391.46	773.64	0.07	0.04	0.16	2.07
20JD03-42	2.89	21.84	8.18	9.10	28.72	25.75	69.70	155.96	243.98	415.75	663.25	966.80	1571.55	1913.01	556.99	0.05	0.04	0.13	3.95
20JD03-43	0.69	13.70	2.23	4.18	17.23	14.76	44.57	115.79	219.31	420.70	777.56	1246.96	2053.98	2641.46	654.91	0.02	0.02	0.12	9.39
20JD03-44	7.43	10.21	4.95	6.08	15.95	5.38	23.57	58.73	100.73	205.13	380.44	611.34	1023.54	1381.30	331.45	0.04	0.02	0.07	1.65
20JD03-45	1.73	16.46	5.57	9.37	23.24	12.75	66.48	132.96	221.63	387.36	641.75	976.92	1469.25	1783.74	520.40	0.04	0.05	0.07	4.51
20JD03-46	5.74	61.26	8.67	15.62	24.39	10.12	52.01	116.34	170.41	288.28	443.31	642.11	914.53	1167.07	385.99	0.15	0.06	0.07	8.50
20JD03-47	18.61	6.69	18.00	20.18	34.26	18.65	68.04	203.05	393.94	801.10	1452.25	2542.51	4568.63	6112.60	1368.12	0.02	0.01	0.09	0.37
20JD03-48	0.19	27.90	4.88	7.72	32.91	14.40	125.98	262.88	481.14	849.27	1246.88	1687.04	2373.85	2708.94	916.10	0.03	0.05	0.05	10.99
20JD03-49	22.83	82.38	49.89	66.15	101.96	63.06	225.03	424.38	640.81	1055.49	1624.31	2259.51	3204.10	3730.08	1308.10	0.09	0.07	0.10	2.27
20JD03-50	0.55	12.30	2.26	7.00	16.08	10.07	33.07	56.23	99.76	141.76	259.56	382.59	647.08	848.78	230.96	0.06	0.05	0.10	8.75
20JD03-51	9.70	53.70	24.15	25.65	40.81	30.14	113.82	172.02	255.28	386.08	526.25	680.57	1020.62	1198.37	464.47	0.14	0.11	0.10	3.17
20JD03-52	250.93	234.99	124.78	127.20	168.51	87.92	296.88	505.82	782.76	1226.74	1852.38	2512.15	3601.55	4464.63	1688.11	0.22	0.08	0.09	1.25
20JD03-53	4.20	14.76	5.14	8.34	32.50	16.57	98.04	179.22	295.28	478.57	743.56	1014.57	1438.94	1835.77	565.69	0.04	0.07	0.06	3.16
20JD03-54	147.05	155.81	137.61	106.08	98.92	48.31	137.09	225.76	364.80	635.35	1006.56	1565.18	2397.33	2987.40	1028.00	0.26	0.06	0.10	1.09
20JD03-55	5.52	75.25	34.81	51.53	133.18	112.43	233.17	438.78	686.50	952.56	1297.88	1668.42	2312.11	2457.32	1064.96	0.10	0.10	0.15	3.73
20JD03-56	6.81	47.49	21.82	34.97	82.50	51.87	157.29	226.87	364.80	531.32	785.69	1023.08	1581.43	1912.20	674.73	0.10	0.10	0.11	3.32
20JD03-57	7.67	31.37	12.21	11.40	31.35	8.51	66.73	137.67	226.54	422.89	654.25	937.25	1525.84	2019.51	552.75	0.06	0.04	0.04	3.16
20JD03-58	0.35	27.29	3.80	12.74	80.61	19.64	332.96	680.33	1169.55	1953.11	2767.69	3504.05	4678.51	4847.56	1923.06	0.02	0.07	0.02	13.15
20JD03-59	41.86	314.71	46.55	46.61	79.12	46.54	135.28	201.94	295.37	402.38	589.13	800.81	1242.80	1415.45	720.58	0.51	0.11	0.11	7.12
20JD03-60	21.18	41.31	31.03	34.90	66.42	37.34	101.21	141.83	192.56	288.83	363.31	502.43	668.63	752.44	346.20	0.21	0.15	0.11	1.58
20JD03-61	16.46	68.60	40.09	60.37	91.28	70.87	162.86	284.49	445.37	723.63	1105.69	1474.90	2200.56	2385.37	912.82	0.12	0.07	0.14	2.43
20JD03-62	18.73	61.32	26.51	25.40	58.04	19.38	147.54	282.27	477.72	799.27	1274.25	1925.91	2947.95	3707.72	1083.77	0.06	0.05	0.05	2.71

20JD03-63	0.04	13.56	0.09	1.05	9.09	6.54	47.84	108.86	191.38	297.07	488.44	670.85	927.76	1071.54	357.72	0.03	0.05	0.06	216.78
20JD03-64	0.57	35.56	1.90	3.81	42.23	31.28	193.27	381.44	724.39	1330.59	2056.44	2918.62	4160.25	4903.66	1526.49	0.02	0.05	0.07	28.84
20JD03-65	274.56	231.78	167.35	164.64	201.42	171.05	212.56	313.30	443.54	642.12	935.81	1325.91	2125.71	2615.04	1124.19	0.43	0.10	0.21	1.05
20JD03-66	0.04	4.45	0.24	1.44	5.55	3.39	16.73	38.48	76.79	155.49	263.31	402.43	678.45	867.89	219.18	0.02	0.02	0.08	32.74
20JD03-67	1.23	36.35	5.84	11.73	44.19	17.92	115.13	238.78	415.45	708.06	1045.94	1475.71	2236.15	2365.45	830.42	0.05	0.05	0.06	10.28
20JD03-68	916.92	956.25	528.23	375.56	377.84	228.06	331.96	386.98	455.04	635.90	819.13	1062.35	1506.71	1695.53	1761.18	1.64	0.22	0.16	1.32
20JD03-69	8.40	80.95	45.47	72.45	128.51	80.11	169.20	194.46	280.89	403.85	532.69	766.40	1205.96	1533.74	580.36	0.24	0.14	0.13	3.01
20JD03-70	1.61	26.43	9.28	17.99	41.22	44.76	97.24	168.42	304.67	507.51	794.44	1213.36	1952.86	2554.07	696.69	0.05	0.05	0.16	4.86
20JD03-71	22.62	118.29	86.85	124.00	171.08	113.68	200.45	294.18	435.45	650.55	984.81	1340.08	2016.96	2172.76	936.32	0.23	0.10	0.15	2.16
20JD03-72	1.86	16.35	6.75	10.61	31.89	17.00	89.15	186.98	302.93	526.74	832.13	1220.65	1887.89	2160.98	669.79	0.03	0.05	0.07	3.80
20JD03-73	0.05	12.66	0.29	1.04	16.62	4.46	47.04	88.92	153.86	258.97	412.50	576.11	914.60	1219.51	333.03	0.03	0.05	0.04	73.99
20JD03-74	50.68	116.15	108.73	128.80	131.76	70.69	149.35	177.56	263.05	464.29	719.75	1019.03	1677.20	1945.93	760.06	0.30	0.09	0.13	1.46
20JD03-75	5.19	17.18	4.03	6.00	9.57	4.17	22.11	54.29	91.10	180.77	315.88	546.15	948.39	1093.90	298.80	0.06	0.02	0.07	3.73
20JD03-76	14.51	82.30	50.86	66.94	118.18	100.36	232.31	352.63	576.26	946.15	1393.25	1874.49	2884.10	3385.37	1181.56	0.11	0.08	0.14	2.52
20JD03-77	15.78	149.97	64.44	74.29	100.14	91.12	136.38	167.87	230.85	317.22	415.25	581.38	784.84	954.88	493.51	0.46	0.17	0.19	3.74
20JD03-78	28.23	109.00	67.24	68.97	100.41	59.86	228.04	363.43	558.05	902.75	1247.75	1631.58	2454.47	2671.14	1075.39	0.14	0.09	0.09	2.28
20JD03-79	36.20	128.29	90.52	70.46	91.89	48.67	146.08	241.00	391.10	636.81	885.44	1214.57	1808.07	1914.23	822.77	0.21	0.08	0.10	2.02
20JD03-80	186.50	222.48	222.74	157.35	88.18	90.05	102.96	154.29	241.10	446.15	830.94	1558.70	3095.53	3688.21	1161.57	0.33	0.03	0.24	1.09
20JD03-81	3.54	33.34	12.52	11.07	41.62	27.96	99.55	175.90	283.62	430.22	577.63	819.03	1306.65	1537.80	515.50	0.07	0.08	0.10	4.15
20JD03-82	7.55	11.66	10.25	11.82	25.74	15.51	67.24	129.36	222.60	401.28	637.06	838.46	1432.17	1714.63	510.09	0.04	0.05	0.08	1.31
20JD03-83	92.62	168.83	166.81	166.28	192.16	123.62	197.94	247.92	310.12	443.04	635.38	900.81	1544.78	1860.57	819.52	0.44	0.13	0.16	1.30
20JD03-84	19.58	38.50	31.36	41.25	132.70	119.54	336.93	624.38	920.85	1267.58	1618.31	2089.47	2963.48	3127.24	1326.29	0.06	0.11	0.13	1.51
20JD03-85	0.18	15.02	0.07	1.09	8.22	3.41	34.97	69.25	123.46	223.44	362.56	569.64	888.01	1025.61	303.48	0.04	0.04	0.04	117.48
20JD03-86	3829.20	2495.92	1800.22	1177.64	404.66	131.08	237.59	277.56	396.34	649.27	987.63	1412.55	2210.12	2421.54	4008.59	4.02	0.11	0.10	0.89
20JD03-87	0.10	18.99	0.65	4.11	29.66	23.94	133.97	246.54	399.76	628.21	1029.56	1198.79	2119.57	1903.66	769.96	0.03	0.06	0.07	50.64
20JD03-88	4.05	18.79	8.05	11.36	28.38	13.48	93.42	153.19	269.47	500.55	714.31	1029.15	1650.43	1864.63	592.42	0.04	0.06	0.06	3.11
20JD03-89	99.41	96.79	54.42	51.03	83.04	40.14	101.31	144.60	205.85	289.01	436.69	702.43	1247.02	1630.49	545.71	0.30	0.08	0.11	1.26
20JD03-90	1.56	17.81	2.87	4.09	27.77	7.41	139.25	297.78	528.13	983.70	1376.88	1840.89	2890.99	2951.22	1043.86	0.02	0.05	0.02	8.05
20JD03-91	187.59	251.11	389.44	468.73	907.84	543.34	1043.52	1275.90	1511.54	1848.72	2192.25	2553.44	3632.80	3634.55	2428.31	0.34	0.29	0.14	0.87
20JD03-92	0.06	14.68	2.77	9.37	30.34	18.28	96.13	167.87	288.78	563.92	783.19	1208.50	1943.60	1962.20	662.44	0.03	0.05	0.07	10.38
20JD03-93	6.29	40.85	19.27	35.36	81.89	52.40	133.72	201.39	299.23	506.78	694.56	908.91	1420.81	1687.80	598.56	0.11	0.09	0.12	3.20

20JD03-94	6.24	41.58	32.22	37.53	78.72	72.29	118.29	201.94	326.99	564.65	926.69	1361.54	2290.12	2833.74	825.25	0.08	0.05	0.18	2.16
20JD03-95	6.62	93.59	49.03	92.01	168.85	125.75	230.30	238.78	311.71	401.83	494.31	647.37	917.08	1028.86	558.72	0.33	0.25	0.16	3.36
20JD03-96	4.24	15.50	6.61	7.96	13.04	13.06	60.75	124.93	231.91	445.97	678.69	966.80	1553.42	1905.69	544.87	0.03	0.04	0.09	2.86
20JD03-97	5.27	78.34	34.38	41.55	162.64	109.06	237.49	476.45	674.15	1000.73	1312.94	1755.87	2610.50	3012.20	1134.43	0.10	0.09	0.14	3.95
20JD03-98	10.51	97.86	77.48	122.65	125.34	125.93	198.54	314.40	508.05	847.07	1263.25	1752.63	2542.80	3312.60	1109.74	0.16	0.08	0.19	2.22
20JD03-99	9.75	31.11	21.88	24.75	44.93	24.37	124.37	234.63	414.07	721.43	1058.25	1414.17	2126.27	2337.40	821.29	0.05	0.06	0.07	1.97
