APPENDIX 1

Major trace and rare element composition of carbonatite and associated rocks from Tajno complex

sample	Carbonatite	Carbonatite	Carbonatite	Carbonatite	Carbonatite	Carbonatite	Carbonatite	Carbonatite	Carbonatite	Carbonatite	Carbonatite	Carbonatite	Carbonatite	Pyroxenite	Pyroxenite	Pyroxenite	Pyroxenite	Pyroxenite	Tuff	Trachyte	Albitite e	Albitite	Syenite	Syenite	Syenite
ID	10-1151	10-1059.7	10-1062.6	10-1085	10-1083	7-1138.5	7-1139.2	7-1173.8	7-1134	7-1128.6	7-1138	11-1027.5	11-1026	1-767.0	10-1049.5	6-614.5	6-1180.4	6-708.2	7-1050.5	11-778.6	10-1091	1-769.5	2-814.3	2-690.4	8-1254.6
SiO_2	0.45	5.73	1.28	2.34	4.31	1.26	2.88	2.79	0.84	2.58	1.06	8.69	5.26	40.17	31.37	39.8	52.08	35.04	62.17	52.83	61.43	63.38	45.03	46.61	55.53
TiO_2	< L.D.	< L.D.	0.06	< L.D.	< L.D.	< L.D.	< L.D.	0.35	< L.D.	< L.D.	< L.D.	< L.D.	0.07	6.08	6.88	5.74	4.55	7.71	0.25	0.61	0.26	0.1	3.85	3.4	0.88
Al_2O_3	0.2	1.31	0.39	0.39	0.78	< L.D.	0.89	0.89	< L.D.	0.8	0.31	2.5	0.43	9.35	4.8	3.61	4.89	3.8	18.43	18.84	17.28	18.4	13.86	14.87	19.54
Fe_2O_3 tot	0.15	2.17	3.6	1.55	5.27	3.64	3.08	2.79	2.99	6.37	3.22	2.28	3.74	16.01	20.02	18.4	8.58	21.36	2.05	3.91	2.54	2.25	13.16	11.37	4.04
MnO	0.26	0.23	0.26	0.3	0.26	0.35	0.37	0.52	0.38	0.36	0.31	0.31	0.29	0.28	0.26	0.19	0.15	0.26	0.2	0.19	0.05	0.04	0.24	0.21	0.12
MgO	0.17	0.21	0.25	0.19	0.16	< L.D.	< L.D.	0.62	0.13	< L.D.	0.23	0.16	0.56	6.22	7.9	11.64	7.16	10.37	0.23	0.85	0.53	0.26	4.66	3.94	0.8
CaO	51.13	46	46.92	48.19	44.38	47.12	45.65	46.2	47.86	43.4	47.34	43.02	45.07	13.89	17.97	17.59	16.58	17.52	1.23	3.9	3.12	1.24	9.71	8.35	3
Na_2O	0.28	0.51	0.29	< L.D.	0.17	0.25	0.46	0.57	0.19	< L.D.	< L.D.	0.44	0.87	2.55	0.96	0.76	2.4	0.75	7.18	5.66	9.33	11.45	4.5	5.05	8.43
K_2O	< L.D.	0.98	0.07	< L.D.	0.43	< L.D.	0.56	0.27	< L.D.	0.44	< L.D.	1.73	0.08	3.04	0.34	0.35	0.7	0.33	5.89	5.31	1.46	0.4	2.98	3.6	5.87
P_2O_5	< L.D.	0.27	0.07	0.57	1.28	0.29	0.32	1.21	0.33	0.46	0.19	< L.D.	3.45	0.99	1.32	0.64	1.51	1.58	0.07	0.16	0.19	< L.D.	1.17	0.93	0.21
CO_2	41.63	36.59	38.41	38.65	34.85	37.33	37.74	36.75	38.29	36.31	39.41	35.52	34.48	1.11	1.63	0.27	0.68	0.41	0.86	3.99	4	1.92	0.3	0.15	1
Total	94.27	94	91.6	92.18	91.89	90.24	91.95	92.96	91.01	90.72	92.07	94.65	94.3	99.69	93.45	98.99	99.28	99.13	98.56	96.25	100.19	99.44	99.46	98.48	99.42
V	2.67	55.7	34.4	77.2	121.5	3.33	3.16	88.3	2.03	2.65	13.6	38.6	306.4	494.7	615.9	478.1	344.5	587.6	3.622	34.2	149.8	35.7	303.8	275.5	84.3
Cr	< L.D.	< L.D.	< L.D.	< L.D.	< L.D.	< L.D.	< L.D.	5.23	< L.D.	< L.D.	< L.D.	< L.D.	8.55	30.8	93.1	510	35.9	172.6	< L.D.	< L.D.	< L.D.	< L.D.	< L.D.	< L.D.	< L.D.
Co	1.01	6.36	15.8	2.95	22.6	6.26	5.35	9.76	5.20	10.3	7.34	8.40	7.89	48.8	70.4	83.3	46.0	84.0	0.29	1.68	7.73	3.92	34.8	29.8	5.63
Ni	6.46	10.2	11.1	8.64	14.1	11.4	7.31	12.7	< L.D.	10.6	8.53	18.4	8.81	47.3	78	185	40.3	110.8	< L.D.	< L.D.	< L.D.	< L.D.	14.5	12.1	< L.D.
Cu	18.7	57.0	112.7	43.3	177.7	9.57	33.1	67.0	< L.D.	30.9	31.7	70.1	32.2	247.8	268.2	560	342.2	277.7	< L.D.	18.7	34.3	22.6	88.6	78.8	20.2
Zn	< L.D.	32.4	12.1	9.31	12.6	3200	< L.D.	540.8	410.7	128.5	65.4	63.1	50.6	218.2	239.8	148.3	85.2	214.8	155.5	142.3	44.2	62.5	193.8	181.7	100.1
Rb	1.48	13.4	2.53	2.83	6.78	3.73	9.86	7.98	2.21	8.95	2.95	20.7	3.83	90.2	13.2	16.1	18	14.5	140.7	137.8	16.6	6.19	67.4	78.4	122.9
Ba	2907	2137	3028	2473	1797	4750	4046	2390	3079	3844	2688	3781	2047	1233	308.9	233.2	284.7	192.7	1970	1930	1226	1093	1404	1404	1602
Th	0.14	10.5	0.59	1.01	1.02	9.26	1.85	64.8	0.50	0.78	0.45	0.24	4.80	10.9	4.40	1.71	5.33	1.57	20.4	20.8	3.18	14.1	5.75	8.81	9.44
U	0.08	0.52	0.26	0.89	0.21	0.13	0.19	22.9	0.19	0.51	0.25	0.73	0.85	1.82	0.658	0.458	1.357	0.306	4.316	4.288	2.077	14.07	1.386	2.093	2.308
Nb	0.424	4.668	4.06	2.782	0.918	3.589	2.353	199.6	1.473	2.463	0.919	3.362	3.442	164.7	101	21.0	51.3	58.5	177.7	165.3	50.0	42.2	83.9	118.5	78.2
Ta	< L.D.	0.08	0.12	< L.D.	0.03	< L.D.	< L.D.	1.91	< L.D.	0.05	< L.D.	0.03	0.04	13.1	13.6	1.66	5.26	4.40	12.5	10.1	2.42	3.05	5.38	7.93	3.25
Pb	12.15	30.68	14.88	16.78	12.77	26.90	23.60	114.4	18.20	22.43	16.60	16.21	14.39	6.31	4.61	6.52	5.03	2.24	28.86	18.46	3.67	40.72	9.24	9.97	23.09
Sr	37050	28380	39880	36250	30060	49070	42650	33840	43010	43440	38770	32730	31450	1064	3990	339.1	554.2	515.9	537.9	2229	1535	1681	1677	1559	1523
Zr	7.57	46.6	17.5	46.2	47.3	5.90	2.88	41.0	1.00	8.38	5.93	13.1	106.4	455.3	279.1	132.9	148.3	208	714.5	669.1	1142	845.6	399.3	545.5	427.9
Hf	0.10	0.93	0.36	1.05	1.02	0.10	0.06	1.17	< L.D.	0.23	0.12	0.31	1.95	12.0	9.23	4.15	4.55	5.74	16.0	14.5	18.2	16.1	9.65	11.8	8.51
Y	60.9	70.8	58.5	72.2	56.5	54.0	48.7	93.6	53	49.2	52.1	49.6	64.1	58.1	58.4	13.5	44.6	27.2	42.3	35.8	12.3	15.8	37.8	41.4	18.3
W	< L.D.	0.93	1.44	0.61	< L.D.	1.77	1.10	4.07	0.55	0.99	< L.D.	< L.D.	< L.D.	1.85	2.97	< L.D.	0.80	0.57	2.00	1.42	2.15	2.86	0.90	1.41	2.60
Cd	1.10	1.04	1.05	0.99	1.23	25.1	0.86	2.01	2.50	1.87	1.25	1.19	0.74	0.72	< L.D.	< L.D.	< L.D.	< L.D.	0.6	< L.D.	0.94	0.60	< L.D.	< L.D.	< L.D.
Ga	3.58	7.04	4.21	4.86	5.09	5.22	6.04	6.22	3.28	5.86	3.93	8.14	6.82	24.8	20.1	14.5	11.7	18.8	32.4	31.2	43.8	51.0	28.5	30.9	28.8
Sn	0.98	0.91	1.00	1.36	1.25	1.12	0.90	3.04	< L.D.	0.78	0.88	1.05	2.05	4.64	4.40	1.86	1.70	2.68	2.73	2.97	0.79	< L.D.	3.19	3.48	1.67
La	541.7	443.2	522.4	539	413.4	1189	537.5	495	488.3	563.5	486	451.7	628.7	162.3	107.7	27.2	93.4	56.3	211.6	171.4	59.7	621.8	108.4	117.8	69.4
Ce	737.7	621.7	689.3	746.8	617.7	1244	726.8	765.2	664.4	771.8	675.9	627	958.8	320.9	253.3	60.19	209.2	129.8	350.5	285.9	86.1	699.1	212	227.9	115.4
Pr	61.4	53.2	55.5	62.3	53.2	92.9	59.4	67.3	57.6	63.2	55.9	51.8	84.7	39.4	35.7	7.89	27.7	17.3	35.9	30.1	7.66	52.8	26.5	27.7	11.3
Nd	175.1	158.1	157.1	180.5	158.4	230.7	165.4	201.8	163.3	174.7	158.2	147.1	252.2	150.6	152.7	34.2	112.5	73.9	112.1	97.9	23.0	129.4	104	105.1	37.5
Sm	20.75	21.04	18.57	22.65	19.98	21.03	17.95	28.68	18.85	18.67	17.91	17.52	29.56	26.62	29.91	6.996	20.7	14.1	15.44	13.98	3.038	8.805	18.32	18.16	5.72
Eu	6.12	6.50	5.35	6.73	5.66	5.74	5.10	9.10	5.44	5.28	5.23	5.06	8.63	7.44	8.8	2.01	5.79	3.92	3.97	4.04	0.918	1.83	5.53	5.39	1.69
Gd	15.76	17.44	15.55	19.11	15.76	16.32	13.78	25.93	14.15	14.46	14.17	14.11	22.85	19.57	23.12	5.30	15.46	10.84	10.34	9.75	2.42	5.69	13.67	13.67	4.32
Tb	2.08	2.26	1.88	2.44	2.03	1.93	1.65	3.72	1.82	1.75	1.76	1.65	2.62	2.59	2.94	0.67	2.02	1.34	1.47	1.34	0.33	0.59	1.77	1.80	0.61
Dy	10.69	11.97	10.04	12.95	10.27	9.88	8.29	19.84	9.42	8.91	8.69	8.49	12.83	12.9	14.48	3.29	10.01	6.37	7.97	7.08	1.90	2.68	8.56	8.9	3.24
Ho	1.99	2.22	1.84	2.32	1.87	1.69	1.54	3.21	1.64	1.56	1.65	1.56	2.11	2.08	2.22	0.50	1.61	0.97	1.39	1.23	0.36	0.44	1.38	1.44	0.59
Er	5.12	5.97	4.96	6.22	4.85	4.58	4.22	7.61	4.57	4.20	4.23	3.96	5.37	5.09	5.04	1.17	3.94	2.25	3.96	3.36	1.09	1.53	3.26	3.60	1.61
Tm	0.69	0.82	0.69	0.84	0.64	0.62	0.57	1.00	0.63	0.59	0.60	0.51	0.65	0.64	0.58	0.15	0.50	0.26	0.57	0.48	0.17	0.25	0.40	0.45	0.24
Yb	4.06	4.86	4.02	5.16	3.69	3.66	3.67	5.97	3.89	3.65	3.51	3.21	3.65	3.67	3.13	0.83	2.92	1.45	3.70	3.11	1.21	1.84	2.34	2.68	1.67
Lu	0.56	0.66	0.58	0.72	0.50	0.49	0.51	0.84	0.54	0.50	0.47	0.40	0.50	0.48	0.39	0.12	0.40	0.20	0.55	0.457	0.20	0.31	0.34	0.38	0.26
ΣREE	1583.73	1349.92	1487.77	1607.71	1307.94	2822.52	1546.37	1635.16	1434.51	1632.76	1434.21	1334.12	2013.2	754.26	640.01	150.47	506.16	318.9	759.46	630.14	180.1	1527.02	506.44	534.94	253.5
Nb/Ta		55.6	32.7		34.0			104.3		49		105	80.0	12.5	7.40	12.6	9.7	13.3	14.3	16.4	20.7	13.8	15.6	14.9	24.1
Zr/Hf	79.7	50.4	49.1	44.1	46.3	60.2	47.1	35.0		37	49	43	55	38.1	30.2	32.0	32.6	36.3	44.6	46.1	62.9	52.5	41.4	46.2	50.3
Y/Ho	30.7	31.9	31.8	31.1	30.2	31.9	31.6	29.1	32.4	32	32	32	30.3	27.9	26.3	26.9	27.7	28.0	30.4	29.2	34.1	35.6	27.4	28.8	30.9
U/Pb	0.006	0.02	0.02	0.05	0.02	0.00	0.01	0.20	0.01	0	0	0	0.06	0.29	0.14	0.07	0.27	0.14	0.15	0.23	0.57	0.35	0.15	0.21	0.10
Th/Pb	0.012	0.34	0.04	0.06	0.08	0.34	0.08	0.57	0.03	0	0	0	0.33	1.73	0.95	0.26	1.06	0.70	0.71	1.13	0.87	0.35	0.62	0.88	0.41