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Title of article Geochemistry of high-potassium rocks from the mid-Tertiary Guffey Volcanic center, Thirtynine Mile volcanic field, central Colorado

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Analyses (18 pgs.)

Supplementary Data for Ms. #9746G, "Geochemistry of High-Potassium Rocks from the Mid-Tertiary Guffey Volcanic Center, Thirtynine Mile Volcanic Field, Central Colorado"

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Analysis	1	2	3	4	5	6
Sample	KS-23	KS-73	KS-79	KS-97	KS-28	KS-71
			Major oxides (weight percent)			
SiO_2	46.79	47.48	47.60	48.24	48.55	49.16
TiO_2	1.69	1.57	1.62	1.45	1.36	1.32
Al_2O_3	15.20	14.20	15.40	16.09	15.28	16.63
Fe_2O_3	4.08	4.19	4.50	4.31	4.28	4.18
FeO	7.58	6.84	7.34	6.47	6.70	6.28
MnO	0.19	0.16	0.19	0.18	0.18	0.18
MgO	7.32	7.01	5.70	5.24	5.96	4.46
CaO	9.81	8.13	8.57	7.91	8.14	7.21
Na_2O	3.70	4.57	2.97	3.22	3.89	3.17
K_2O	0.76	1.32	2.65	3.16	2.10	3.26
P_2O_5	0.66	0.78	0.71	0.66	0.66	0.84
LOI	2.21	2.22	1.70	1.97	2.00	0.97
TOTAL	99.99	98.47	98.95	98.90	99.10	97.66
			Trace elements (ppm)			
Rb	14	11	50	86	66	71
Sr	1116	889	1145	998	1279	1356
Ba	1215	1317	1667	1406	1195	1930
Y	28	28	34	30	34	30
Zr	185	210	194	205	202	204
V	268	237	220	235	210	187
Ni	55	77	29	25	37	14
Cr	142	215	44	59	90	22
Co	39		35		36	
Sc	29		26		29	
Hf	4.2		4.7		4.9	
Th	5.5		7.7		7.3	
Ta	1.5		1.2		1.4	
U	1.5		1.6		1.7	
La	46.9		61.7		59.0	
Ce	97		117		101	
Nd	44		53		48	
Sm	8.27		10.1		10.0	
Eu	2.60		3.57		3.14	
Tb	1.0		1.0		1.2	
Yb	2.69		2.72		2.89	
Lu	0.38		0.40		0.39	

Analysis	7	8	9	10	11	12
Sample	KS-48	KS-1.5	KS-91	KS-82	KS-80	KS-24
			Major oxides (weight percent)			
SiO_2	49.25	49.35	49.81	50.74	50.93	57.23
TiO_2	1.37	1.40	1.39	1.50	1.43	0.71
Al_2O_3	14.58	15.06	16.23	16.65	16.84	18.44
Fe_2O_3	4.13	4.20	4.16	4.73	4.28	2.77
FeO	6.73	6.85	6.24	6.53	6.16	2.89
MnO	0.18	0.18	0.16	0.18	0.14	0.10
MgO	6.29	5.72	5.07	4.27	2.91	1.27
CaO	9.35	9.04	7.11	7.12	7.46	4.32
Na_2O	3.98	3.41	3.01	3.46	3.09	4.26
K_2O	1.32	2.00	3.26	3.20	2.94	4.42
P_2O_5	0.70	0.70	0.60	0.78	1.01	0.44
LOI	1.09	0.94	1.39	0.64	1.67	0.90
TOTAL	98.97	98.85	98.43	99.80	98.86	97.75
			Trace elements (ppm)			
Rb	370	422	79	81	63	118
Sr	1202	1149	1132	1278	1220	1338
Ba	1292	1217	1337	1483	1684	2042
Y	46	49	29	36	37	25
Zr	211	193	178	244	334	304
V	231	226	203	171	172	84
Ni	55	40	30	11	13	8
Cr	154	103	64	18	25	13
Co		33		27		11
Sc		28		18		7
Hf		4.5		5.3		7.1
Th		7.4		8.4		13
Ta		1.6		1.7		1.2
U		1.8		1.7		2.8
La		57.4		64.1		80.3
Ce		106		115		127
Nd		50		51		50
Sm		9.62		9.50		8.47
Eu		2.81		3.43		2.66
Tb		1.1		1.1		0.8
Yb		2.65		2.80		2.81
Lu		0.39		0.43		0.44

Analysis	13	14	15	16	17	18
Sample	KS-98	KS-95	KS-29	KS-93	KS-44	KS-46
			Major oxides (weight percent)			
SiO_2	57.78	60.50	61.49	61.63	61.76	61.80
TiO_2	0.78	0.71	0.55	0.56	0.53	0.56
Al_2O_3	17.67	17.95	17.39	17.53	17.61	17.57
Fe_2O_3	3.49	2.51	2.22	2.33	2.26	2.16
FeO	3.64	2.41	2.14	2.16	2.00	2.00
MnO	0.11	0.09	0.19	0.06	0.08	0.10
MgO	1.66	1.30	0.96	1.30	1.19	1.21
CaO	3.99	3.10	3.41	3.39	3.38	3.39
Na_2O	4.32	4.09	4.13	4.19	4.19	4.21
K_2O	4.08	4.59	4.64	4.54	4.53	4.69
P_2O_5	0.53	0.34	0.33	0.33	0.31	0.33
LOI	1.20	1.27	1.05	0.79	0.66	0.82
TOTAL	99.25	98.86	98.50	98.81	98.50	98.84
			Trace elements (ppm)			
Rb	105	108	119	115	118	120
Sr	1266	869	998	990	997	991
Ba	1917	1921	2258	2054	2066	2022
Y	21	27	24	24	20	21
Zr	270	300	337	340	315	330
V	92	53	50	47	46	42
Ni	7	5	9	5	4	8
Cr	16	10	10	6	6	10
Co		7		7		
Sc		6		5		
Hf		6.9		7.5		
Th		11		11		
Ta		1.7		1.5		
U		2.5		2.5		
La		72.3		73.0		
Ce		124		116		
Nd		51		47		
Sm		8.46		6.80		
Eu		2.60		2.19		
Tb		0.9		0.7		
Yb		3.03		2.51		
Lu		0.45		0.38		

Analysis	19	20	21	22	23	24
Sample	KS-86	KS-90	KS-99	KS-14	KS-77	KS-30
			Major oxides (weight percent)			
SiO_2	62.29	63.08	64.41	67.80	67.87	68.72
TiO2	0.56	0.45	0.37	0.21	0.22	0.22
Al_2O_3	17.69	16.77	16.39	16.31	16.31	15.90
Fe_2O_3	2.02	2.07	1.64	1.09	1.09	0.94
FeO	2.28	1.77	1.46	0.82	0.82	0.74
MnO	0.07	0.09	0.16	0.07	0.11	0.06
MgO	0.98	0.82	0.90	0.37	0.32	0.17
CaO	3.36	2.50	2.14	1.26	1.27	1.36
Na_2O	4.32	4.23	4.15	4.45	4.56	4.65
K_2O	4.71	5.09	4.71	5.61	5.57	5.27
P_2O_5	0.34	0.23	0.18	0.04	0.04	0.06
LOI	0.59	0.87	0.83	0.95	0.60	0.70
TOTAL	99.21	97.97	97.34	98.98	98.78	98.79
			Trace elements (ppm)			
Rb	122	146	128	153	155	137
Sr	1019	857	769	553	540	597
Ba	2118	2164	2096	2108	2050	2082
Y	24	26	23	23	26	17
Zr	333	350	366	325	327	313
V	47	31	18	12	18	21
Ni	4	1	3	4	6	5
Cr	4	4	11	6	2	4
Co					1.2	1.3
Sc					1.9	1.2
Hf					8.7	7.7
Th					15	14
Ta					2.8	2.5
U					3.0	2.8
La					88.1	90.8
Ce					142	144
Nd					50	52
Sm					7.04	7.69
Eu					2.11	2.30
Tb					0.8	0.8
Yb					2.97	2.58
Lu					0.46	0.38

Analysis	25	26	27	28	29	30
Sample	R-9	R-22	R-64	R-19	R-56	R-44
			Major oxides (weight percent)			
SiO_2	47.15	47.21	47.69	47.92	48.01	48.16
TiO_2	1.73	1.97	1.40	1.48	1.43	1.61
Al_2O_3	13.90	15.34	14.73	15.95	15.26	16.20
Fe_2O_3	5.22	4.40	4.85	3.69	4.52	2.79
FeO	6.46	7.13	5.82	6.96	5.88	7.84
MnO	0.18	0.18	0.19	0.19	0.17	0.19
MgO	7.84	5.22	6.52	5.89	6.00	5.49
CaO	10.12	9.92	9.59	9.12	8.44	8.36
Na_2O	2.61	3.03	3.38	2.55	2.67	3.23
K_2O	1.44	1.61	1.43	2.52	2.81	2.46
P_2O_5	0.61	0.67	0.59	0.58	0.54	0.81
LOI	3.04	3.64	3.09	2.40	3.49	2.27
TOTAL	100.30	100.32	99.20	99.25	99.22	99.41
			Trace elements (ppm)			
Rb	99	49	52	50	76	54
Sr	843	1556	1206	1000	1234	1452
Ba	1101	1352	1239	1188	1181	1559
Y	25	17	21	27	19	13
Zr	110	181	163	100	134	187
V	243	313	239	209	241	228
Ni	54	22	40	18	35	18
Cr	127	41	101	57	90	41
Co	44				39	
Sc	34				31	
Hf	5.0				4.4	
Th	5.2				7.0	
Ta	1.5				1.7	
U	0.7				1.6	
La	45.9				52.4	
Ce	92				93	
Nd	51				43	
Sm	8.54				8.39	
Eu	2.65				2.78	
Tb	1.0				0.9	
Yb	2.42				2.43	
Lu	0.33				0.36	

Analysis	31	32	33	34	35	36
Sample	R-31	R-55	R-41	R-43	R-66	R-73
			Major oxides (weight percent)			
SiO_2	49.13	49.62	49.92	54.72	55.40	56.18
TiO_2	1.49	1.46	1.43	1.07	1.06	0.97
Al_2O_3	15.64	16.18	15.98	16.13	16.09	19.12
Fe_2O_3	4.43	2.71	3.52	7.68	4.02	4.56
FeO	6.00	7.45	6.45	0.82	3.86	0.56
MnO	0.19	0.18	0.18	0.11	0.13	0.10
MgO	5.62	5.40	5.25	3.38	3.51	0.86
CaO	9.00	7.95	7.69	5.42	6.00	4.12
Na_2O	2.85	3.19	2.93	3.63	3.78	4.06
K_2O	2.70	3.34	3.25	3.71	3.58	4.89
P_2O_5	0.56	0.73	0.62	0.56	0.45	0.61
LOI	2.42	2.05	2.10	2.32	1.68	3.65
TOTAL	100.03	100.26	99.32	99.55	99.48	99.68
			Trace elements (ppm)			
Rb	55	104	37	81	85	76
Sr	1006	1303	1137	1143	1139	1050
Ba	1235	1509	1472	1605	1464	1810
Y	29	18	30	19	20	17
Zr	136	181	189	223	193	298
V	238	221	224	178	153	111
Ni	32	24	30	31	15	8
Cr	59	54	54	51	97	8
Co	41			24		
Sc	33			17		
Hf	4.4			5.3		
Th	6.1			9.7		
Ta	1.5			1.6		
U	1.9			1.4		
La	51.4			66.0		
Ce	95			117		
Nd	45			50		
Sm	9.14			9.02		
Eu	2.98			3.17		
Tb	1.1			1.0		
Yb	3.08			2.80		
Lu	0.45			0.41		

Analysis	37	38	39	40	41	42
Sample	R-26	R-30	R-14	R-62	R-27	R-65
			Major oxides (weight percent)			
SiO_2	57.64	57.88	61.47	61.84	62.05	62.40
TiO_2	0.92	0.46	0.65	0.61	0.46	0.46
Al_2O_3	17.25	18.61	17.03	17.15	18.08	17.99
Fe_2O_3	4.64	4.32	3.79	4.16	3.50	3.47
FeO	1.80	0.30	1.06	0.70	0.58	0.75
MnO	0.15	0.12	0.07	0.14	0.06	0.09
MgO	2.19	1.51	1.45	0.92	0.98	1.01
CaO	4.23	3.96	3.40	3.62	3.43	3.24
Na_2O	4.27	3.88	4.24	4.22	4.15	4.56
K_2O	4.64	3.72	4.50	4.39	4.35	4.46
P_2O_5	0.53	0.25	0.33	0.33	0.24	0.30
LOI	1.60	5.04	1.64	1.55	1.46	1.42
TOTAL	99.86	100.05	99.63	99.63	99.34	100.15
			Trace elements (ppm)			
Rb	119	43	102	105	108	98
Sr	1131	1176	786	1018	1139	1113
Ba	1767	2249	1613	1951	2036	2106
Y	21	15	17	16	13	11
Zr	326	278	175	271	267	263
V	95	42	45	60	43	38
Ni	7	5	1	5	3	6
Cr	19	5	2	5	13	12
Co					6.4	5.5
Sc					3.6	3.6
Hf					7.0	6.5
Th					13	11
Ta					1.8	1.9
U					2.8	3.0
La					85.0	75.9
Ce					133	122
Nd					44	46
Sm					7.0	7.11
Eu					2.29	2.46
Tb					0.5	0.8
Yb					2.51	2.54
Lu					0.41	0.41

Analysis	43	44	45	46	47	48
Sample	R-39	R-63	R-61	R-70	R-21	R-13
			Major oxides (weight percent)			
SiO_2	62.48	62.58	65.56	66.29	67.19	67.58
TiO_2	0.45	0.62	0.40	0.29	0.28	0.26
Al_2O_3	18.19	17.36	16.64	16.33	17.19	16.92
Fe_2O_3	3.55	3.97	2.80	1.95	1.64	1.86
FeO	0.49	0.81	0.39	0.64	0.44	0.42
MnO	0.07	0.08	0.13	0.09	0.09	0.15
MgO	0.83	1.03	0.52	0.33	0.43	0.32
CaO	3.47	3.52	2.51	1.86	1.45	1.75
Na_2O	4.31	4.26	4.27	3.95	4.58	4.55
K_2O	4.47	4.42	4.84	4.94	5.51	5.45
P_2O_5	0.23	0.32	0.15	0.12	0.05	0.07
LOI	1.52	1.51	0.94	2.46	1.40	0.68
TOTAL	100.06	100.48	99.15	99.25	100.25	100.01
			Trace elements (ppm)			
Rb	112	111	117	119	136	121
Sr	1124	1002	793	713	593	523
Ba	2000	1894	1970	1970	2079	1805
Y	13	20	14	11	23	14
Zr	273	281	276	215	353	215
V	50	57	39	21	13	14
Ni	9	6	6	4	4	1
Cr	12	8	16	11	11	2
Co		9		3.4	1.6	
Sc		6.5		2.8	2.1	
Hf		6.9		6.2	8.1	
Th		14		15	15	
Ta		2.2		2.1	2.4	
U		3.1		2.9	3.1	
La		83.9		75.5	87.4	
Ce		137		108	130	
Nd		51		38	44	
Sm		7.91		5.68	7.10	
Eu		2.64		1.80	1.98	
Tb		0.9		0.7	0.9	
Yb		2.80		2.46	2.96	
Lu		0.45		0.37	0.45	

Analysis	49	50	51	52	53	54
Sample	R-81	R-45	F-25	F-28	E-33	F-36
			Major oxides (weight percent)			
SiO_2	68.52	69.14	46.47	47.48	48.30	48.34
TiO_2	0.19	0.20	1.88	1.69	1.45	1.51
Al_2O_3	16.16	16.32	15.58	14.48	16.20	14.83
Fe_2O_3	1.62	1.51	4.80	4.61	4.09	4.21
FeO	0.27	0.27	6.68	6.53	6.71	6.66
MnO	0.06	0.12	0.19	0.19	0.19	0.18
MgO	0.24	0.20	5.19	6.71	5.29	7.21
CaO	1.25	1.23	9.01	9.61	8.18	9.20
Na_2O	4.38	4.67	3.14	3.35	3.19	2.90
K_2O	5.39	5.50	2.41	1.66	2.89	1.72
P_2O_5	0.05	0.05	0.69	0.59	0.86	0.59
LOI	1.28	0.91	4.27	3.17	1.95	3.06
TOTAL	99.41	100.12	100.31	100.07	99.30	100.41
			Trace elements (ppm)			
Rb	132	132	97	99	46	59
Sr	472	483	883	1678	1341	924
Ba	1731	1885	1208	1155	1784	1068
Y	16	22	30	24	24	27
Zr	243	240	134	136	184	100
V	9	18	237	204	256	210
Ni	2	10	17	38	13	52
Cr	3	10	37	99	33	158
Co		1.7		40		40
Sc		3.2		32		29
Hf		8.4		5.0		4.7
Th		20		5.8		6.4
Ta		3.0		1.8		1.5
U		3.3		1.3		0.9
La		108		50.7		51.9
Ce		170		104		91
Nd		61		46		44
Sm		8.61		8.82		8.72
Eu		2.26		2.55		2.56
Tb		0.9		0.9		1.0
Yb		3.26		2.67		2.40
Lu		0.47		0.37		0.33

Analysis	55	56	57	58	59	60
Sample	ED-17	F-57	E-D4	E-38	E-52	E-17
			Major oxides (weight percent)			
SiO_2	48.37	48.51	48.58	48.69	48.72	48.73
TiO_2	1.66	1.60	1.59	1.68	1.46	1.39
Al_2O_3	15.77	16.05	16.08	15.89	15.36	15.63
Fe_2O_3	3.41	4.44	4.52	4.18	5.95	4.55
FeO	7.31	6.49	6.37	6.85	4.94	6.23
MnO	0.18	0.19	0.18	0.19	0.17	0.17
MgO	5.48	5.30	5.29	5.70	5.81	6.80
CaO	8.56	8.28	8.17	8.22	8.53	8.24
Na_2O	2.84	3.59	3.23	3.05	2.38	2.53
K_2O	3.17	2.27	2.82	3.20	2.93	2.37
P_2O_5	0.60	0.72	0.75	0.71	0.58	0.52
LOI	2.12	2.32	2.47	2.25	2.42	2.53
TOTAL	99.47	99.76	100.05	100.61	99.25	99.69
			Trace elements (ppm)			
Rb	76	49	52	86	64	47
Sr	1389	1171	1241	1370	1650	954
Ba	1254	1338	1613	1341	1586	1264
Y	22	19	26	25	21	27
Zr	185	115	198	194	132	131
V	218	193	217	223	202	259
Ni	22	18	12	20	27	37
Cr	38	37	29	33	58	91
Co	35				40	38
Sc	24				31	29
Hf	4.6				4.5	3.1
Th	7.2				5.5	3.3
Ta	1.4				1.1	1.0
U	1.9				0.9	0.9
La	56.0				50.2	35.6
Ce	101				100	66
Nd	42				46	32
Sm	8.84				8.84	6.66
Eu	2.83				3.03	2.43
Tb	1.0				1.1	0.9
Yb	2.48				2.81	2.31
Lu	0.36				0.39	0.33

Analysis	61	62	63	64	65	66
Sample	F-26	ED-23	E-12	ED-14	E-56	E-41
			Major oxides (weight percent)			
SiO_2	48.90	49.14	49.21	49.31	49.36	50.59
TiO_2	1.43	1.39	1.44	1.46	1.54	1.48
Al_2O_3	15.57	14.41	16.25	16.30	16.66	15.94
Fe_2O_3	6.04	3.08	8.26	4.50	3.74	7.39
FeO	5.18	6.29	2.60	6.34	6.82	3.70
MnO	0.18	0.18	0.18	0.19	0.18	0.18
MgO	5.43	6.81	4.99	4.99	4.88	4.49
CaO	7.69	8.84	8.14	7.73	8.19	7.79
Na_2O	3.22	2.03	3.06	3.46	3.80	3.13
K_2O	3.32	3.84	3.04	2.92	2.31	3.18
P_2O_5	0.66	0.63	0.68	0.68	0.75	0.56
LOI	2.32	2.80	2.05	2.27	2.34	1.60
TOTAL	99.94	99.44	99.90	100.15	100.57	100.03
			Trace elements (ppm)			
Rb	76	120	61	73	32	72
Sr	1020	1091	1094	1207	1537	1123
Ba	1219	1283	1618	1471	1776	1411
Y	28	27	26	21	17	28
Zr	103	203	186	147	193	196
V	194	231	248	240	234	229
Ni	22	51	17	14	18	19
Cr	65	200	37	28	37	44
Co		37				
Sc		29				
Hf		4.9				
Th		8.0				
Ta		1.6				
U		2.3				
La		61.5				
Ce		107				
Nd		50				
Sm		10.1				
Eu		3.39				
Tb		1.2				
Yb		2.69				
Lu		0.41				

Analysis	67	68	69	70	71	72
Sample	E-21	E-45	E-6	E-28C	E-29	E-37
			Major oxides (weight percent)			
SiO_2	51.42	52.24	52.49	53.01	53.89	56.83
TiO_2	1.37	1.34	1.32	1.43	1.04	0.84
Al_2O_3	16.14	16.32	16.29	15.56	17.77	16.43
Fe_2O_3	7.59	4.76	7.33	7.85	4.92	6.59
FeO	2.56	4.60	1.98	1.88	2.67	0.62
MnO	0.16	0.14	0.13	0.15	0.14	0.12
MgO	4.28	4.27	4.02	3.74	2.60	2.37
CaO	7.35	7.10	6.48	6.10	5.96	4.70
Na_2O	3.10	3.40	3.48	3.78	3.88	3.45
K_2O	3.21	3.10	3.59	3.96	3.80	4.42
P_2O_5	0.54	0.57	0.61	0.52	0.70	0.43
LOI	1.81	2.01	2.77	1.86	2.35	3.36
TOTAL	99.53	99.85	100.49	99.84	99.72	100.16
			Trace elements (ppm)			
Rb	75	62	77	98	104	81
Sr	1017	993	1132	1051	1200	1824
Ba	1575	1422	1411	1713	1718	1845
Y	26	20	18	27	25	19
Zr	168	187	196	280	432	204
V	218	219	184	179	88	107
Ni	21	20	16	13	5	10
Cr	37	31	35	32	10	19
Co	31		25			
Sc	24		19			
Hf	4.1		4.8			
Th	6.1		9.5			
Ta	1.1		1.1			
U	1.1		2.4			
La	50.7		64.2			
Ce	95		103			
Nd	45		45			
Sm	8.55		8.37			
Eu	2.88		2.74			
Tb	0.9		1.0			
Yb	2.52		2.22			
Lu	0.38		0.33			

Analysis	73	74	75	76	77	78
Sample	E-34	E-51	E-31	F-65	DJ-131D	DJ-164
			Major oxides (weight percent)			
SiO_2	58.85	59.98	61.36	62.58	62.52	66.78
TiO_2	0.78	0.75	0.63	0.44	0.41	0.27
Al_2O_3	16.75	16.26	17.55	17.75	16.33	16.19
Fe_2O_3	5.69	5.58	3.82	3.26	3.79	1.82
FeO	0.35	0.73	1.00	0.85		
MnO	0.14	0.11	0.08	0.09	0.15	0.17
MgO	2.21	1.72	1.30	0.82	0.66	0.47
CaO	3.75	4.03	3.44	3.43	3.32	1.10
Na_2O	4.11	3.52	4.12	4.33	3.94	4.10
K_2O	4.39	4.75	4.44	4.36	5.18	5.99
P_2O_5	0.44	0.40	0.33	0.24	0.16	0.06
LOI	2.38	1.58	1.59	1.43		
TOTAL	99.84	99.41	99.66	99.58	96.46	96.95
			Trace elements (ppm)			
Rb	107	138	112	99	170	200
Sr	1044	1340	1058	937	646	448
Ba	1684	1630	1858	1735		
Y	17	19	18	15		
Zr	268	305	314	166		
V	90	81	43	43		
Ni	8	11	3	1		
Cr	20	15	12	1		
Co	13	12	6.8			
Sc	8.3	8.9	5.6			
Hf	5.9	5.6	6.1			
Th	12	10	10			
Ta	1.8	1.5	1.8			
V	2.6	2.2	2.6			
La	70.8	74.0	72.9			
Ce	113	126	126			
Nd	43	50	47			
Sm	7.05	8.75	7.42			
Eu	2.38	2.98	2.32			
Tb	0.7	0.8	0.9			
Yb	2.40	2.53	2.74			
Lu	0.37	0.38	0.39			

Analysis	79	80	81	82	83	84	85
Sample	DJ-87	DJ-197	DJ-95	DJ-82	DJ-202	DJ-84	DJ-212
				Major oxides (weight percent)			
SiO_2	66.91	67.39	67.89	70.08	70.34	73.61	73.70
TiO_2	0.20	0.25	0.33	0.08	0.26	0.08	0.34
Al_2O_3	15.72	16.28	15.01	13.70	16.49	14.20	13.31
Fe_2O_3	1.64	1.55	3.02	0.54	2.19	0.69	1.56
FeO							
MnO	0.12	0.02	0.10	0.07	0.09	0.07	0.02
MgO	0.21	0.13	1.13		0.50		0.31
CaO	1.17	1.41	3.72	1.09	1.75	1.19	1.78
Na_2O	4.46	3.99	3.85	3.84	4.29	4.13	2.39
K_2O	5.70	5.15	4.80	4.46	5.56	4.47	5.16
P_2O_5	0.04	0.09	0.14	0.01	0.09	0.01	0.10
LOI							
TOTAL	96.27	96.26	99.99	93.87	101.56	98.45	98.67
				Trace elements (ppm)			
Rb	140	124	138	134	120	135	110
Sr	600	729	752	379	500	384	939
Ba	2400	2294	1825	891	2100	969	1799
Y		32	28	13		14	14
Zr		480	401	133		138	285
V		18	17	4		10	19
Ni							
Cr	2	1	76	1.0	2.4		93
Co	2			1.3	16		3
Sc	1.8			1.3	4.2		
Hf	7.1			3.4	9.2		
Th	15			6.3	12		
Ta	2.2			2.6	4.3		
U	2.9			4.6	3.3		
La	99.5			10.9	86.3		
Ce	157			22	135		
Nd	56			9	51		
Sm	8.29			1.76	7.93		
Eu	2.28			0.59	2.48		
Tb	0.8			0.4	1.1		
Yb	3.02			1.53	3.17		
Lu	0.46			0.28	0.46		

Analysis	86	87	88	89	90	91
Sample	DJ-211	DJ-50	AB-8.4	HPD	HB	D85
			Major oxides (weight percent)			
SiO_2	74.60	76.42	51.82	54.31	54.45	54.58
TiO_2	0.07	0.08	1.44	1.66	1.35	1.14
Al_2O_3	13.24	13.78	17.16	15.31	17.43	18.15
Fe_2O_3	0.38	0.29	10.46	5.05	5.15	4.65
FeO				4.03	4.12	3.72
MnO	0.01	0.05	0.16	0.18	0.15	0.14
MgO	0.21		4.24	4.63	3.14	2.97
CaO	1.40	1.03	6.70	6.77	6.58	6.03
Na_2O	1.52	3.88	3.87	3.96	3.75	4.12
K_2O	6.40	5.00	3.71	3.59	3.18	3.85
P_2O_5		0.03	0.79	0.80	0.54	0.77
LOI						
TOTAL	97.83	100.56	100.35	100.29	99.84	100.12
			Trace elements (ppm)			
Rb	155	120	100	84	75	90
Sr	481	400	700	1063	952	1329
Ba	660	1300	1300	1400	1300	1900
Y	9		31	29	29	29
Zr	126					
V	15					
Ni						
Cr	1	1.2	5	120	12	7
Co		1.6	10	26	25	22
Sc		1.2	10	17	21	15
Hf		3.2	6.8	6.8	6.0	5.8
Th		6.2	10	10.9	6.5	8.8
Ta		2.2	1.6	2.8	1.2	1.8
U		4.5	2.3	2.5	1.2	1.9
La		11.1	69.5	78.7	55.1	69.6
Ce		21	121	136	95	125
Nd		9	50	55	40	53
Sm		1.73	8.55	9.95	8.37	9.79
Eu		0.63	2.80	3.32	2.69	2.90
Tb		0.4	1.0	0.9	1.0	1.1
Yb		1.39	3.03	2.72	2.82	2.76
Lu		0.26	0.44	0.40	0.43	0.41

Analysis	92	93	94	95	96	97
Sample	HD4	AB-7.2	GHD	AB-8.3	D13	AB-6.14
			Major oxides (weight percent)			
SiO_2	56.30	58.74	61.01	61.66	63.11	64.76
TiO_2	1.29	1.29	0.93	0.95	0.71	0.41
Al_2O_3	17.10	17.58	16.14	17.17	16.99	17.80
Fe_2O_3	4.57	8.72	4.98	6.32	3.57	3.77
FeO	3.64		1.47		1.07	
MnO	0.16	0.07	0.11	0.03	0.12	0.06
MgO	2.61	0.85	2.05	1.71	1.01	0.43
CaO	5.86	4.34	4.10	3.53	2.10	2.80
Na_2O	4.02	4.00	3.72	4.01	3.10	4.60
K_2O	3.46	3.97	4.76	4.40	7.40	5.05
P_2O_5	0.68	0.61	0.39	0.61	0.40	0.29
LOI						
TOTAL	99.69	100.17	99.66	100.39	99.58	99.97
			Trace elements (ppm)			
Rb	83	87	196	104	153	121
Sr	1092	776	606	722	410	901
Ba	1500	1900	1300	1500	1600	1400
Y	31	30	34	31	28	23
Zr						
V						
Ni						
Cr	6	2	3	19	2.2	16
Co	20	1.6	15	30	9	16
Sc	14	4.2	12	20	8	16
Hf	6.6	7.4	11.0	5.7	8.9	5.6
Th	10.4	14	28.5	8.8	12.5	8.5
Ta	1.8	1.9	3.5	1.7	2.1	1.3
U	2.5	2.1	6.8	2.1	2.7	2.4
La	75.6	86.0	88.6	63.3	77.2	60.9
Ce	128	144	159	115	128	115
Nd	54	49	60	51	47	48
Sm	9.90	7.64	10.2	9.60	7.84	8.64
Eu	3.12	2.12	2.63	2.98	2.30	2.82
Tb	1.2	1.0	1.4	1.0	1.1	1.1
Yb	3.33	3.11	4.02	2.89	3.01	3.00
Lu	0.48	0.44	0.64	0.42	0.46	0.46

Analysis	98	99	100	101	102	103
Sample	AB-9.1	AB-11.1	GK-14-3	GK-6-8	GK-4-8	GK-10.1
			Major oxides (weight percent)			
SiO_2	66.40	70.48	59.16	59.75	61.47	65.03
TiO_2	0.36	0.15	0.97	0.59	0.52	0.56
Al_2O_3	17.37	15.90	14.82	17.28	17.33	16.09
Fe_2O_3	3.35	2.04	7.09	4.66	4.27	3.71
FeO						
MnO	0.03	0.02	0.11	0.10	0.06	0.05
MgO	0.33	0.63	1.43	1.35	0.94	0.34
CaO	2.88	1.01	4.68	3.65	3.17	2.64
Na_2O	4.78	3.39	3.35	4.10	4.13	3.64
K_2O	4.60	6.24	4.09	4.35	4.62	5.26
P_2O_5	0.25	0.05	0.56	0.37	0.30	0.23
LOI			1.46	1.42	1.05	1.42
TOTAL	100.35	99.91	97.72	97.62	97.86	98.97
			Trace elements (ppm)			
Rb	110	142	102	123	139	144
Sr	972	307	905	995	1070	803
Ba	2100	2100	1820	2650	2690	2340
Y	22	28	28	28	30	35
Zr			188	266	284	274
V						
Ni			14	6	6	8
Cr	2.5	2.5	37	16	30	23
Co	2.5	1.8	14	6	6	4
Sc	2.9	2.6	12	5.4	4.5	6.5
Hf	6.2	6.5	5.8	7.2	6.9	7.8
Th	11	11	9.7	10	11	11
Ta	1.6	1.5	0.7	1.8	1.8	1.3
U	2.5	2.5	1.5	2.5	2.8	2.4
La	73.5	73.0	66.9	74.1	81.1	86.9
Ce	119	119	122	122	151	152
Nd	42	43	50	46	52	55
Sm	6.80	6.75	8.49	7.48	8.18	8.41
Eu	1.92	2.44	2.58	2.72	2.19	2.07
Tb	0.7	0.8	0.9	0.8	0.8	1.1
Yb	2.44	2.36	2.36	2.66	2.76	3.00
Lu	0.37	0.35	0.33	0.39	0.40	0.43