

Appendix III. Sanidine microprobe major and XRF trace element analyses

Area	Yellowstone						Jemez Mountains			Lipari
Location	Nez Perce Creek	Upper Basin member	Dry Creek	Solfatar Plateau	Mount Jackson	Lava Creek Tuff	Bear Canyon	Camp May- Pajarito Mtn	Ancho Canyon	Aeolian Arc Italy
Unit	Qpcn	Qpu	Qpcd	Qpcf	Qmj	Qyl	Qbt (Upper Bandelier Tuff)			V. ne Gabelotto
# of Sample	98821	98822	98823	98824	98825	98827	95504	95521	95531	98502
Average Microprobe Analyses										
# of points	23	11	28	19	27	17	22	14	28	11
SiO ₂	66.25 (0.49)	64.54 (0.32)	65.88 (0.22)	65.09 (0.39)	66.44 (0.24)	65.36 (0.17)	67.04 (0.27)	66.08 (0.21)	66.25 (0.19)	65.28 (0.15)
Al ₂ O ₃	19.50 (0.27)	20.26 (0.34)	19.87 (0.24)	19.31 (0.33)	19.58 (0.15)	19.75 (0.19)	19.68 (0.16)	19.54 (0.26)	19.24 (0.14)	19.11 (0.15)
Fe ₂ O ₃	0.17 (0.02)	0.16 (0.03)	0.19 (0.03)	0.18 (0.02)	0.11 (0.03)	0.10 (0.04)	0.22 (0.02)	0.21 (0.04)	0.21 (0.02)	0.08 (0.03)
CaO	0.55 (0.06)	0.44 (0.21)	0.70 (0.15)	0.73 (0.08)	0.29 (0.03)	0.41 (0.07)	0.26 (0.08)	0.50 (0.16)	0.14 (0.02)	0.19 (0.02)
Na ₂ O	6.42 (0.72)	4.75 (0.30)	5.85 (0.19)	6.02 (0.14)	5.45 (0.29)	5.25 (0.14)	6.68 (0.22)	7.20 (0.41)	6.71 (0.11)	3.55 (0.07)
K ₂ O	7.09 (1.11)	9.73 (0.43)	7.38 (0.39)	7.32 (0.20)	9.24 (0.40)	9.33 (0.30)	7.70 (0.41)	6.47 (0.64)	7.44 (0.15)	11.79 (0.12)
Total	99.98	99.88	99.87	98.65	101.11	100.19	101.58	100.00	100.00	100.00
An mol%	2.67	2.16	3.51	3.59	1.38	1.93	1.19	2.36	0.68	0.90
Ab mol%	56.37	40.20	52.70	53.55	46.60	45.21	56.22	61.36	57.42	31.13
Or mol%	40.96	57.64	43.80	42.85	52.02	52.86	42.59	36.28	41.89	67.97
XRF trace element analyses										
Rb	67 (3.87)	119 (6.87)	85 (4.90)	47 (2.71)	191 (11.02)	126 (7.27)	64 (3.69)	44 (2.54)	109 (6.29)	186 (10.73)
Sr	73 (2.98)	277 (11.30)	150 (6.12)	71 (2.90)	10 (0.41)	122 (4.98)	42 (1.71)	73 (2.98)	10 (0.41)	105 (4.28)
Ba	2703 (92.44)	8979 (307.1)	5074 (173.5)	4546 (155.5)	163 (5.57)	4934 (168.7)	223 (7.63)	396 (13.54)	50 (1.71)	98 (3.35)
Y	7 (0.32)	6 (0.28)	5 (0.23)	5 (0.23)	1 (0.05)	6 (0.28)	7 (0.32)	4 (0.18)	14 (0.65)	7 (0.32)
Zr	5 (0.21)	2 (0.08)	1 (0.04)	11 (0.46)	7 (0.29)	0	22 (0.92)	13 (0.54)	17 (0.71)	16 (0.67)
Nb	1 (0.07)	n.d.	n.d.	n.d.	5 (0.37)	n.d.	8 (0.59)	0	19 (1.41)	4 (0.30)
Th	0	n.d.	1	1	2	1	3	0	0	n.d.
La	11	13	12	10	5	6	3	3	6	
Ce	n.d.		n.d.	n.d.			3	n.d.	8	
Nd	n.d.		n.d.	n.d.			6	4	12	
Ba/Sr	37.03	32.42	33.83	64.03	16.30	40.44	5.31	5.42	5.00	0.93
Two-feldspar temperature (°C) (Elkins and Grove, 1990)		832 (17)			753 (12)	811 (25)				712 (34)

Number in parentheses represents standard errors.

n.d. = Not detectable

Appendix III. Sanidine microprobe major and XRF trace element analyses (continued)

Area	Colorado	Thomas Range			Long Valley				Taylor Creek	
Location	Engineer Mtn	Topaz Mtn		Spor Mtn	Glass Creek	Deer Mtn	Mammoth K	Glass Mtn	Punch Bowl	Boiler Peak
Unit					Cp		Qmm	ODgs	Qmrm	SMC
# of Sample	92690	98701	98702	98703	98711	98713	98714	98716	98717	98911
Average Microprobe Analyses										
# of points	XRF	31	20	30	16	7	6	18	16	23
SiO ₂	63.06 (0.53)	66.14 (0.34)	66.21 (0.18)	66.26 (0.41)	64.99 (0.20)	65.28 (0.25)	65.93 (0.01)	66.20 (0.26)	66.14 (0.15)	65.86 (0.39)
Al ₂ O ₃	22.48 (0.40)	19.81 (0.28)	19.54 (0.23)	19.48 (0.32)	19.35 (0.18)	19.19 (0.28)	19.43 (0.01)	19.34 (0.25)	19.55 (0.10)	19.38 (0.37)
Fe ₂ O ₃	0.14 (0.05)	0.12 (0.06)	0.10 (0.03)	0.05 (0.03)	0.10 (0.06)	0.10 (0.02)	0.09 (0.01)	0.09 (0.03)	0.08 (0.03)	0.15 (0.05)
CaO	0.32 (0.14)	0.23 (0.04)	0.22 (0.04)	0.10 (0.02)	0.16 (0.02)	0.16 (0.02)	0.13 (0.01)	0.13 (0.02)	0.18 (0.03)	0.38 (0.11)
Na ₂ O	8.65 (0.59)	5.05 (0.03)	5.02 (0.33)	5.47 (0.19)	3.37 (0.06)	3.66 (0.07)	3.76 (0.06)	4.79 (0.02)	4.07 (0.10)	5.45 (0.22)
K ₂ O	5.26 (0.73)	9.99 (0.39)	10.08 (0.45)	9.42 (0.22)	11.93 (0.10)	12.02 (0.15)	11.98 (0.05)	10.58 (0.01)	11.42 (0.14)	8.87 (0.38)
	99.91	101.33	101.17	100.77	99.90	100.40	101.32	101.13	101.44	100.08
An mol%	1.44	1.07	1.03	0.45	0.78	0.74	0.64	0.61	0.85	1.83
Ab mol%	70.40	42.97	42.63	46.67	29.82	31.39	32.10	40.53	34.84	47.42
Or mol%	28.16	55.96	56.34	52.88	69.39	67.87	67.27	58.86	64.31	50.75
XRF trace element analyses										
Rb	117 (6.75)	393 (22.68)	478 (27.58)	701 (40.45)	99 (5.71)	104 (6.00)	123 (7.10)	151 (8.71)	121 (6.98)	192 (11.08)
Sr	16 (0.65)	50 (2.04)	30 (1.22)	4 (0.16)	588 (23.99)	483 (19.71)	190 (7.75)	6 (0.24)	52 (2.12)	16 (0.65)
Ba	162 (5.54)	154 (5.27)	60 (2.05)	12 (0.41)	6735 (230.3)	4930 (168.6)	788 (26.95)	26 (0.89)	380 (13.00)	98 (3.35)
Y	8 (0.37)	15 (0.69)	15 (0.69)	24 (1.11)	5 (0.23)	5 (0.23)	8 (0.37)	8 (0.37)	5 (0.23)	21 (0.97)
Zr	12 (0.50)	9 (0.38)	7 (0.29)	4 (0.17)	3 (0.13)	1 (0.04)	9 (0.38)	3 (0.13)	2 (0.08)	17 (0.71)
Nb	6 (0.45)	13 (0.96)	15 (1.11)	26 (1.93)	n.d.	n.d.	n.d.	6 (0.45)	3 (0.22)	14 (1.04)
Th	n.d.	3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4
La										5
Ce										21
Nd										
Ba/Sr	10.13	3.08	2.00	3.00	11.45	10.21	4.15	4.33	7.31	6.13
Two-feldspar temperature (°C) (Elkins and Grove, 1990)		774 (23)	749 (12)	654 (18)	716 (16)	711 (33)	693 (31)	668 (8)	686 (15)	762 (10)

Appendix III. Sanidine microprobe major and XRF trace element analyses (continued)

Area	Taylor Creek			Jemez Mountains		
Location	North Boiler Peak	Penamoum Canyon	Kemp Mesa	BM 8407	Jemez Falls	Las Conchas Campground
Unit	BLP	DGC	KPM	Qvvf (South Mountain Rhyolite-SMC)		
# of Sample	98912	98913	98914	93908B	95811B	98901
Average Microprobe Analyses						
# of points	57	23	20	10	6	10
SiO ₂	66.86 (0.22)	66.19 (0.27)	66.18 (0.18)	66.06 (0.27)	65.78 (0.21)	66.11 (0.20)
Al ₂ O ₃	19.39 (0.16)	19.43 (0.20)	19.31 (0.14)	19.20 (0.28)	19.04 (0.24)	19.59 (0.16)
Fe ₂ O ₃	0.13 (0.04)	0.14 (0.02)	0.16 (0.03)	0.12 (0.02)	0.14 (0.03)	0.10 (0.03)
CaO	0.33 (0.06)	0.28 (0.04)	0.36 (0.04)	0.20 (0.02)	0.20 (0.01)	0.19 (0.01)
Na ₂ O	6.23 (0.34)	5.90 (0.37)	5.29 (0.20)	4.64 (0.17)	4.58 (0.22)	4.70 (0.09)
K ₂ O	7.52 (0.49)	8.50 (0.60)	8.97 (0.32)	10.63 (0.22)	10.26 (0.32)	10.63 (0.07)
	100.48	100.44	100.27	100.85	100.00	101.32
An mol%	1.67	1.34	1.77	0.94	0.98	0.92
Ab mol%	53.37	50.66	46.44	39.52	40.06	39.85
Or mol%	44.96	48.00	51.79	59.54	58.97	59.24
XRF trace element analyses						
Rb	297 (17.14)	208 (12.00)	201 (11.60)	154 (8.89)	156 (9.00)	158 (9.12)
Sr	10 (0.41)	9 (0.37)	36 (1.47)	87 (3.55)	86 (3.51)	80 (3.26)
Ba	45 (1.54)	44 (1.50)	230 (7.87)	781 (26.71)	726 (24.83)	671 (22.95)
Y	13 (0.60)	10 (0.46)	11 (0.51)	8 (0.37)	7 (0.32)	7 (0.32)
Zr	11 (0.46)	6 (0.25)	9 (0.38)	0	0	n.d.
Nb	12 (0.89)	9 (0.67)	8 (0.59)	2 (0.15)	1 (0.07)	2 (0.15)
Th	4	n.d.	1	n.d.	0	1
La	3	1	2			2
Ce		9				
Nd						
Ba/Sr	4.50	4.89	6.39	8.98	8.44	8.39
Two-feldspar temperature (°C) (Elkins and Grove, 1990)		703 (12)	778 (18)	709 (15)	718 (18)	729 (14)