An Insight into the Origin of Fluidal Obsidian Pyroclasts from a Basaltic Fissure Eruption, Ascension Island, South Atlantic

ANNABELLE FOSTER

Table 1: Normalised major element analyses (wt. %) for volcanic glass.

Sample number	Distance (µm)	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
ACAF24 TRANSECT 2	0.00	68.07	0.51	12.55	4.72	0.20	0.08	1.22	7.59	5.03	0.02	100.00
	59.99	71.57	0.18	12.62	3.05	0.14	0.08	0.50	6.26	5.59	0.01	100.00
	79.99	71.99	0.17	12.67	3.00	0.13	0.02	0.36	5.81	5.84	0.01	100.00
	99.99	72.02	0.18	12.65	3.00	0.12	0.03	0.34	5.82	5.83	0.01	100.00
	119.99	72.47	0.18	12.69	2.89	0.10	0.03	0.27	5.61	5.75	0.00	100.00
	139.98	72.64	0.18	12.65	2.82	0.13	0.02	0.23	5.60	5.71	0.02	100.00
	159.98	72.52	0.18	12.61	2.89	0.11	0.03	0.21	5.58	5.87	0.01	100.00
	179.98	72.39	0.18	12.74	2.90	0.13	0.02	0.17	5.41	6.05	0.01	100.00
	199.98	72.61	0.18	12.75	2.79	0.14	0.01	0.22	5.52	5.78	0.01	100.00
	219.98	72.66	0.19	12.86	2.77	0.13	0.05	0.24	5.40	5.70	0.00	100.00
	239.97	72.85	0.18	12.45	3.05	0.13	0.02	0.27	5.45	5.60	0.00	100.00
	259.97	72.48	0.18	13.05	2.74	0.13	0.01	0.29	5.44	5.66	0.03	100.00
	279.97	72.71	0.17	12.75	3.08	0.13	0.04	0.27	5.22	5.63	0.01	100.00
	299.97	72.84	0.17	12.63	3.02	0.14	0.01	0.28	5.26	5.63	0.00	100.00
	319.96	72.24	0.18	12.75	3.22	0.13	0.04	0.37	5.34	5.70	0.03	100.00
	339.96	72.36	0.18	12.78	3.21	0.12	0.02	0.36	5.42	5.52	0.04	100.00
	359.96	72.29	0.18	12.83	3.07	0.13	0.04	0.31	5.40	5.75	0.00	100.00
	379.96	72.42	0.18	12.82	3.09	0.14	0.00	0.29	5.39	5.68	0.01	100.00
	399.95	72.53	0.18	12.53	3.11	0.14	0.04	0.34	5.50	5.62	0.00	100.00
	419.95	72.25	0.19	12.77	3.33	0.14	0.03	0.37	5.29	5.64	0.00	100.00
	439.95	72.54	0.18	12.21	3.33	0.14	0.06	0.32	5.38	5.82	0.01	100.00
	459.95	72.32	0.18	12.74	3.33	0.14	0.02	0.24	5.28	5.73	0.01	100.00
	479.95	72.35	0.17	12.79	3.20	0.14	0.02	0.32	5.49	5.50	0.01	100.00
	499.94	72.22	0.18	12.94	2.94	0.14	0.04	0.32	5.41	5.79	0.02	100.00
	519.94	72.30	0.17	12.77	2.99	0.15	0.03	0.33	5.56	5.69	0.01	100.00
	539.94	72.31	0.18	12.92	3.12	0.14	0.03	0.35	5.35	5.61	0.00	100.00
	559.94	72.42	0.18	12.71	3.34	0.14	0.02	0.33	5.28	5.58	0.01	100.00
	579.94	72.70	0.18	12.73	2.93	0.14	0.02	0.36	5.30	5.63	0.00	100.00
	599.93	72.44	0.17	12.78	3.11	0.14	0.04	0.38	5.38	5.57	0.00	100.00

Table 1: continued

Sample number	Distance (µm)	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
ACAF24 TRANSECT 2	619.93	72.70	0.18	12.51	2.99	0.14	0.02	0.36	5.31	5.79	0.00	100.00
	639.93	72.31	0.17	12.91	2.96	0.15	0.03	0.34	5.33	5.77	0.01	100.00
	659.93	72.51	0.18	12.62	3.03	0.15	0.04	0.41	5.46	5.61	0.01	100.00
	679.92	73.08	0.17	12.36	2.95	0.14	0.01	0.36	5.34	5.58	0.01	100.00
	699.92	72.89	0.18	12.65	2.88	0.15	0.02	0.40	5.29	5.56	0.00	100.00
ACAF24 TRANSECT (Scoria edge to rhyolitic glass)	0.00	71.46	0.34	12.19	4.24	0.13	0.05	0.36	5.82	5.34	0.07	100.00
	20.01	72.13	0.20	12.69	3.41	0.13	0.04	0.33	5.42	5.65	0.01	100.00
	40.01	72.74	0.18	12.61	2.89	0.14	0.04	0.32	5.34	5.72	0.00	100.00
	60.02	72.66	0.17	12.68	2.91	0.15	0.03	0.37	5.37	5.65	0.01	100.00
	80.02	72.54	0.17	12.80	2.92	0.14	0.04	0.33	5.50	5.54	0.01	100.00
	100.03	72.29	0.18	12.89	2.97	0.15	0.02	0.38	5.38	5.73	0.00	100.00
	120.03	72.53	0.18	12.81	2.97	0.13	0.02	0.37	5.38	5.60	0.02	100.00
	140.04	73.17	0.17	12.37	2.89	0.12	0.07	0.30	5.42	5.48	0.00	100.00
	160.05	72.84	0.18	12.50	3.11	0.16	0.04	0.31	5.38	5.48	0.01	100.00
	200.06	72.81	0.17	12.70	2.95	0.17	0.05	0.37	5.24	5.53	0.02	100.00
	220.06	72.68	0.18	12.64	3.08	0.15	0.05	0.33	5.24	5.64	0.01	100.00
	240.07	72.41	0.17	12.72	3.06	0.14	0.03	0.33	5.43	5.72	0.00	100.00
	260.07	72.49	0.17	12.76	3.09	0.14	0.02	0.31	5.25	5.75	0.01	100.00
	280.08	72.85	0.17	12.82	3.06	0.13	0.02	0.31	5.26	5.37	0.01	100.00
ACAF32_3 TRANSECT 3	0.00	72.98	0.17	12.70	3.02	0.14	0.02	0.31	5.68	4.97	0.01	100.00
	50.01	72.94	0.23	12.52	3.11	0.15	0.01	0.38	5.84	4.82	0.01	100.00
	200.06	72.88	0.18	12.59	3.01	0.14	0.04	0.37	5.86	4.93	0.00	100.00
	250.07	72.61	0.18	12.56	3.20	0.15	0.03	0.35	5.92	4.99	0.01	100.00
	300.09	72.95	0.17	12.79	3.29	0.14	0.03	0.36	5.51	4.73	0.01	100.00
ACAF32_3 TRANSECT 1	0.00	72.46	0.17	13.17	2.93	0.14	0.04	0.34	5.87	4.89	0.00	100.00
	100.00	72.30	0.18	12.93	3.10	0.13	0.06	0.33	5.89	5.09	0.00	100.00
	800.01	72.65	0.17	12.87	3.12	0.14	0.04	0.34	5.77	4.90	0.00	100.00
	900.01	72.84	0.18	12.77	2.98	0.13	0.05	0.34	5.81	4.92	0.00	100.00
ACAF32_3 TRANSECT (Phenocryst to bubble)	0.00	72.82	0.17	12.91	3.02	0.13	0.02	0.37	5.87	4.66	0.01	100.00
	50.04	72.84	0.17	13.11	2.95	0.14	0.02	0.39	5.59	4.78	0.01	100.00
	100.07	74.07	0.17	12.11	2.81	0.13	0.04	0.33	5.64	4.70	0.01	100.00

Table 1: continued

Sample number	Distance (µm)	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
ACAF32_3 TRANSECT	150.11	73.09	0.17	12.89	2.88	0.14	0.00	0.35	5.80	4.67	0.00	100.00
(Phenocryst to bubble)	200.14	73.04	0.17	12.79	2.98	0.15	0.02	0.38	5.74	4.74	0.00	100.00
	250.18	73.03	0.17	12.52	2.98	0.14	0.04	0.39	5.90	4.80	0.01	100.00
	300.21	72.92	0.17	12.78	3.02	0.16	0.02	0.34	5.94	4.65	0.01	100.00
	350.25	72.72	0.17	12.94	3.02	0.14	0.04	0.34	5.88	4.76	-0.01	100.00
	400.29	73.16	0.19	12.68	2.94	0.15	0.04	0.36	5.57	4.91	0.01	100.00
ACAF36B TRAVERSE 1	20.04	68.86	0.23	15.22	3.10	0.09	0.09	0.24	8.09	4.08	0.02	100.00
	40.05	72.08	0.19	12.59	3.45	0.14	0.07	0.21	5.85	5.42	0.01	100.00
	60.07	72.98	0.17	12.48	2.88	0.13	0.06	0.19	5.58	5.52	0.01	100.00
	80.08	73.06	0.17	12.32	3.04	0.15	0.06	0.26	5.49	5.46	0.00	100.00
	100.10	73.18	0.18	12.39	2.81	0.14	0.03	0.24	5.62	5.40	0.01	100.00
	120.12	72.72	0.17	13.04	2.55	0.13	0.05	0.26	6.21	4.88	0.00	100.00
	140.14	72.83	0.17	12.48	3.31	0.14	0.03	0.29	5.61	5.14	0.00	100.00
	160.16	72.83	0.18	12.27	3.14	0.15	0.10	0.31	5.67	5.36	0.01	100.00
	180.17	73.09	0.26	11.80	3.67	0.18	0.09	0.32	5.53	5.04	0.01	100.00
	200.19	72.90	0.22	11.88	3.75	0.16	0.08	0.31	5.60	5.09	0.01	100.00
	220.21	72.92	0.19	12.51	3.07	0.15	0.04	0.26	5.61	5.24	0.01	100.00
	240.23	72.79	0.18	12.94	2.87	0.14	0.05	0.30	5.49	5.23	0.01	100.00
	260.25	71.95	0.17	13.43	2.87	0.15	0.06	0.32	6.04	5.01	0.01	100.00
	280.27	73.24	0.18	12.38	2.84	0.13	0.04	0.35	5.49	5.35	0.00	100.00
	300.29	72.83	0.17	12.76	2.94	0.12	0.04	0.34	5.44	5.34	0.01	100.00
	320.31	72.74	0.18	13.01	2.79	0.13	0.05	0.36	5.57	5.15	0.01	100.00
	340.33	73.02	0.17	12.46	2.96	0.14	0.05	0.32	5.66	5.22	0.00	100.00
ACAF36B TRAVERSE 2	0.00	55.73	2.28	14.44	7.54	0.19	2.79	7.75	6.31	1.64	1.33	100.00
	19.98	55.96	1.97	16.96	8.15	0.12	1.69	5.24	7.26	1.70	0.94	100.00
	59.94	57.47	1.20	7.90	10.04	0.58	5.24	9.56	5.34	2.13	0.54	100.00
	99.90	72.96	0.18	12.24	3.01	0.12	0.08	0.28	5.71	5.42	0.00	100.00
	139.86	73.00	0.18	12.75	2.65	0.13	0.08	0.31	5.64	5.26	0.00	100.00
	159.84	73.09	0.18	12.58	2.98	0.13	0.04	0.34	5.44	5.21	0.00	100.00
	179.81	72.73	0.18	12.87	3.07	0.14	0.05	0.35	5.46	5.15	0.00	100.00

Table 1: continued

Sample number	Distance (µm)	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
ACAF36B TRAVERSE 2	199.79	72.76	0.19	12.42	3.06	0.15	0.05	0.37	5.72	5.26	0.01	100.00
	239.75	72.52	0.17	12.94	3.02	0.14	0.05	0.36	5.68	5.10	0.01	100.00
	259.73	73.29	0.17	12.44	2.95	0.14	0.03	0.35	5.55	5.08	0.00	100.00
	279.71	72.90	0.17	12.81	2.94	0.15	0.05	0.33	5.45	5.20	0.00	100.00
	299.69	72.91	0.18	12.95	2.74	0.14	0.06	0.34	5.47	5.22	0.00	100.00
	319.67	72.89	0.17	12.55	2.96	0.14	0.06	0.33	5.54	5.35	0.01	100.00
	339.65	72.85	0.18	12.51	3.15	0.14	0.04	0.32	5.61	5.20	0.01	100.00
	379.61	73.04	0.17	12.53	3.02	0.13	0.07	0.37	5.59	5.08	0.00	100.00
	399.59	72.51	0.18	12.65	2.98	0.13	0.04	0.39	5.79	5.33	0.00	100.00
	419.57	73.08	0.17	12.60	2.79	0.13	0.06	0.32	5.67	5.18	0.00	100.00
	439.55	72.77	0.17	12.72	3.15	0.14	0.06	0.34	5.55	5.10	0.00	100.00
	459.53	73.08	0.17	12.50	3.06	0.14	0.03	0.31	5.46	5.24	0.00	100.00
ACAFB TRAVERSE 1	0.00	58.85	2.71	16.09	6.04	0.23	2.46	4.20	6.71	1.54	1.17	100.00
	39.90	57.03	0.25	25.41	1.25	0.02	0.32	8.55	6.58	0.48	0.13	100.00
	59.84	57.43	0.64	21.95	4.43	0.10	0.29	6.66	7.20	0.73	0.58	100.00
	79.79	72.72	0.24	13.12	2.55	0.08	0.20	0.40	5.48	5.17	0.04	100.00
	99.73	73.03	0.17	12.49	2.89	0.12	0.26	0.47	5.36	5.22	-0.01	100.00
ACAFB TRAVERSE 2	0.00	57.00	2.87	15.80	8.49	0.22	1.75	4.08	7.35	1.27	1.18	100.00
	20.02	56.81	1.14	17.41	8.25	0.18	2.52	4.01	7.68	1.13	0.88	100.00
	59.99	65.43	0.25	12.49	3.74	0.26	3.07	4.45	5.79	4.41	0.10	100.00
	79.99	72.60	0.23	12.26	3.32	0.11	0.34	0.36	5.78	4.98	0.01	100.00
	99.98	72.63	0.17	12.75	2.98	0.13	0.32	0.37	5.62	5.04	0.01	100.00
	119.98	73.37	0.17	12.73	2.64	0.11	0.28	0.29	5.45	4.95	0.02	100.00
	139.97	73.05	0.17	12.44	2.70	0.11	0.22	0.32	5.80	5.18	0.01	100.00
	179.96	72.73	0.17	13.06	2.61	0.12	0.14	0.31	5.77	5.09	0.00	100.00
	199.96	73.55	0.17	12.67	2.60	0.12	0.14	0.27	5.72	4.76	0.00	100.00
	219.95	73.44	0.17	12.51	2.68	0.12	0.09	0.37	5.72	4.89	0.01	100.00
	239.95	73.07	0.17	12.66	2.79	0.11	0.08	0.33	5.75	5.02	0.01	100.00

Table 2: Normalised major element analyses (wt. %) for volcanic glass.

Sample number	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
ACAF32_1	73.10	0.17	12.80	2.79	0.13	0.05	0.35	5.93	4.66	0.01	100.00
	72.41	0.17	13.44	2.86	0.11	0.02	0.26	6.83	3.89	0.00	100.00
	73.09	0.17	12.62	3.05	0.13	0.03	0.31	5.87	4.72	0.00	100.00
	73.12	0.16	12.65	2.98	0.15	0.01	0.36	5.76	4.79	0.01	100.00
	73.19	0.16	12.73	3.04	0.13	0.03	0.28	5.81	4.62	0.01	100.00
	73.16	0.17	12.72	2.90	0.13	0.05	0.36	5.79	4.71	0.01	100.00
	72.97	0.17	12.67	3.03	0.15	0.01	0.32	5.82	4.85	0.01	100.00
	72.63	0.18	13.03	3.08	0.14	0.04	0.34	5.85	4.72	0.00	100.00
	73.00	0.18	12.55	3.00	0.13	0.05	0.38	5.83	4.88	0.00	100.00
ACAF37	72.09	0.18	13.09	3.25	0.16	0.02	0.20	6.15	4.86	0.01	100.00
	73.15	0.21	13.27	2.62	0.08	0.03	0.20	5.97	4.41	0.05	100.00
	70.28	0.17	13.86	2.99	0.10	0.04	0.05	6.34	6.15	0.01	100.00
	72.80	0.14	12.55	2.79	0.07	0.01	0.22	5.38	6.03	0.01	100.00
ACAF36B	55.51	1.95	18.84	7.02	0.21	2.19	6.06	6.12	1.23	0.87	100.00
Scoria glass	56.09	2.06	13.95	8.57	0.18	2.88	6.13	6.46	2.46	1.22	100.00
	56.79	2.52	15.67	8.96	0.16	1.67	4.17	5.71	3.14	1.21	100.00
	57.00	2.37	14.93	8.96	0.17	2.69	3.88	5.48	3.21	1.30	100.00

Table 3: Major element analyses (wt. %) of feldspar phenocryst traverses in the glass and percentage An, Ab, Or composition.

Sample number	Distance (µm)	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	BaO	SrO	Total	An%	Ab%	Or%
ACAF24	0.00	65.79	0.01	19.03	0.31	0.00	BDL	0.10	7.62	6.04	BDL	0.02	98.91	0.48	65.42	34.10
	19.99	66.17	0.01	18.58	0.32	0.01	BDL	0.10	7.60	6.08	0.00	0.01	98.88	0.46	65.21	34.33
	39.97	66.56	0.01	18.67	0.31	BDL	BDL	0.06	7.62	6.18	0.02	0.01	99.44	0.29	65.02	34.70
	59.96	66.37	0.01	18.98	0.32	BDL	BDL	0.06	7.64	6.26	0.02	0.00	99.65	0.26	64.82	34.92
	79.95	66.34	0.01	18.75	0.32	BDL	BDL	0.06	7.49	6.24	0.01	0.01	99.22	0.30	64.42	35.28
	99.93	66.43	0.01	18.73	0.30	BDL	BDL	0.08	7.61	6.22	0.01	0.00	99.39	0.38	64.81	34.81
	119.93	66.98	0.01	18.95	0.31	BDL	BDL	0.10	7.82	6.01	0.01	0.00	100.19	0.48	66.08	33.44
ACAF32_3	30.00	66.98	0.01	19.19	0.31	0.01	BDL	0.31	9.53	3.43	0.01	0.01	99.77	1.45	79.68	18.86
	60.01	67.12	0.01	18.85	0.31	0.00	BDL	0.15	8.92	4.37	0.00	0.01	99.73	0.69	75.10	24.21
	90.01	67.12	0.01	18.80	0.31	0.01	BDL	0.11	8.26	5.06	0.01	0.02	99.68	0.50	70.92	28.58
	150.02	67.18	0.01	18.77	0.27	0.00	BDL	0.13	8.34	4.99	0.00	0.01	99.70	0.59	71.31	28.09
	180.02	66.79	0.01	19.12	0.30	BDL	BDL	0.17	9.09	4.30	0.01	0.01	99.79	0.79	75.67	23.54
	240.03	66.65	0.01	18.78	0.31	BDL	BDL	0.11	8.99	4.41	0.01	0.01	99.27	0.52	75.19	24.29
	270.03	67.55	0.01	19.24	0.28	0.00	BDL	0.19	8.90	4.27	0.00	0.01	100.45	0.87	75.35	23.78
	300.04	66.74	0.01	18.87	0.27	BDL	BDL	0.23	9.00	4.10	0.00	0.01	99.23	1.06	76.14	22.81
	330.04	67.15	0.01	18.98	0.28	0.00	BDL	0.26	9.22	3.62	0.00	0.01	99.52	1.21	78.51	20.27
	390.05	67.73	0.03	18.44	0.75	0.02	0.00	0.39	9.49	2.72	0.01	0.02	99.59	1.85	82.60	15.55
	420.05	66.84	0.01	19.10	0.30	0.01	BDL	0.25	9.07	3.90	0.01	0.01	99.51	1.18	77.03	21.79
ACAF32_3	0.00	67.98	0.03	18.36	0.75	0.01	BDL	0.51	9.75	2.26	0.00	0.02	99.67	2.42	84.66	12.92
	29.98	67.14	0.01	19.38	0.33	0.00	BDL	0.33	9.43	3.37	0.00	0.01	99.99	1.52	79.74	18.74
	59.93	67.14	0.01	18.99	0.36	0.01	BDL	0.24	9.45	3.28	BDL	0.02	99.49	1.13	80.51	18.36
	89.89	67.24	0.01	19.00	0.32	0.00	BDL	0.24	9.26	3.62	0.00	0.02	99.72	1.14	78.63	20.23
	119.86	67.37	0.01	19.14	0.31	0.01	BDL	0.13	8.81	4.54	0.01	0.00	100.32	0.59	74.23	25.17
	149.83	66.47	0.02	19.01	0.31	0.00	BDL	0.13	8.53	4.66	0.01	0.02	99.16	0.61	73.10	26.29
	179.79	66.63	0.01	18.83	0.31	0.00	BDL	0.18	8.79	4.31	0.00	0.01	99.06	0.84	74.98	24.17
	209.75	66.88	0.01	19.10	0.33	BDL	0.01	0.23	9.21	3.93	0.01	0.01	99.73	1.09	77.24	21.67
	239.72	67.04	0.01	19.19	0.31	0.00	BDL	0.32	9.32	3.37	0.01	0.01	99.58	1.52	79.57	18.91
	269.68	67.63	0.03	18.42	0.62	0.02	0.00	0.47	9.96	2.25	0.00	0.01	99.41	2.20	85.16	12.64

Table 4: Major element analyses (wt. %) of feldspar phenocryts in the glass and percentage An, Ab, Or composition.

Sample number		SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	BaO	SrO	Total	An (%)	Ab (%)	Or (%)
ACAF36B (C)	Feldspar	67.43	0.01	18.89	0.31	BDL	BDL	0.06	7.82	5.76	0.01	0.01	100.30	0.30	67.14	32.56
(C)	phenocrysts	68.15	0.01	19.00	0.36	BDL	BDL	0.09	7.90	5.57	BDL	0.00	101.07	0.42	68.00	31.58
(C)	in obsidian	67.29	0.01	18.97	0.39	BDL	BDL	0.07	7.80	5.79	0.00	0.01	100.33	0.32	66.96	32.72
(C)		67.63	0.01	18.77	0.28	BDL	BDL	0.10	7.73	5.96	0.00	0.01	100.49	0.48	66.03	33.50
(C)		66.38	0.01	18.84	0.29	BDL	BDL	0.12	7.89	5.84	0.01	0.01	99.39	0.57	66.87	32.56
(C)		67.25	0.01	18.91	0.30	BDL	BDL	0.06	7.82	5.94	0.00	0.01	100.29	0.27	66.53	33.20
(C)		67.26	0.01	18.94	0.30	BDL	BDL	0.08	7.83	5.86	0.00	0.01	100.29	0.39	66.75	32.87
(I)		67.78	0.01	18.94	0.28	0.01	BDL	0.11	7.65	5.87	0.00	0.01	100.64	0.52	66.13	33.35
(I)		66.83	0.01	18.90	0.34	BDL	BDL	0.08	8.38	5.28	0.00	0.01	99.83	0.38	70.41	29.20
(I)		66.96	0.01	18.96	0.30	0.00	BDL	0.10	7.84	5.90	0.01	0.01	100.08	0.48	66.58	32.94
(I)		66.86	0.01	19.17	0.27	0.00	BDL	0.08	7.79	5.97	0.01	0.01	100.16	0.39	66.21	33.40
(I)		66.71	0.01	18.81	0.31	BDL	BDL	0.15	7.79	5.89	0.01	0.01	99.67	0.70	66.29	33.01
(I)		66.40	0.01	18.92	0.31	0.00	BDL	0.09	7.93	5.79	0.00	0.02	99.47	0.44	67.25	32.31
(I)		69.77	0.07	16.05	1.24	0.04	BDL	0.23	7.81	4.53	0.01	0.01	99.77	1.17	71.53	27.31
(I)		66.84	0.01	18.71	0.31	BDL	BDL	0.11	7.82	5.98	0.00	0.01	99.78	0.51	66.19	33.30
(R)		68.07	0.01	19.04	0.35	0.01	BDL	0.15	8.77	4.59	0.00	0.02	101.01	0.69	73.88	25.43
(R)		66.80	0.01	18.99	0.32	BDL	BDL	0.21	9.19	3.82	0.00	0.01	99.34	0.97	77.76	21.28
(R)		66.67	0.01	18.91	0.31	0.00	BDL	0.11	7.95	5.57	0.01	0.01	99.54	0.52	68.09	31.39
(R)		67.02	0.01	18.84	0.37	BDL	BDL	0.21	8.86	3.96	0.00	0.01	99.28	1.00	76.52	22.48
(R)		67.41	0.01	19.16	0.34	0.00	BDL	0.13	7.73	5.93	0.01	0.00	100.73	0.62	66.03	33.36
(R)		67.08	0.02	18.17	0.56	0.02	BDL	0.19	8.63	4.33	0.00	0.01	99.02	0.91	74.50	24.60
(R)		66.30	0.01	18.70	0.31	0.00	BDL	0.13	8.03	5.44	0.00	0.01	98.93	0.62	68.75	30.62
ACAF36B (C)	Feldspar	55.23	0.08	28.04	0.51	0.00	0.07	10.82	5.42	0.30	0.03	0.15	100.65	51.56	46.73	1.71
(C)		54.75	0.09	27.85	0.51	BDL	0.07	10.62	5.65	0.29	0.03	0.14	100.00	50.14	48.22	1.64
(C)		56.82	0.08	27.48	0.50	0.00	0.08	10.01	6.09	0.36	0.03	0.15	101.61	46.62	51.38	2.00
(C)		55.33	0.09	28.17	0.50	0.00	0.07	10.75	5.69	0.30	0.02	0.14	101.07	50.19	48.14	1.67
(C)		53.04	0.08	28.53	0.51	0.00	0.08	11.18	5.38	0.27	0.02	0.14	99.25	52.62	45.85	1.52
(C)		53.83	0.08	28.19	0.54	0.00	0.07	10.90	5.50	0.29	0.01	0.14	99.57	51.40	46.95	1.65
(C)		53.77	0.09	27.90	0.56	0.01	0.08	10.62	5.62	0.31	0.03	0.14	99.12	50.22	48.06	1.72
(R)		54.39	0.10	28.01	0.57	0.00	0.07	10.97	5.27	0.29	0.01	0.14	99.83	52.63	45.73	1.64
(R)		54.70	0.09	28.02	0.55	0.01	0.08	11.01	5.58	0.29	0.03	0.16	100.51	51.32	47.06	1.62

Table 4 continued

Sample number		SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	BaO	SrO	Total	An (%)	Ab (%)	Or (%)
ACAF36B (R)	Feldspar	55.87	0.13	26.66	0.70	0.01	0.10	9.82	5.98	0.38	0.05	0.18	99.87	46.56	51.29	2.14
(R)	phenocrysts	54.56	0.12	27.23	0.72	0.00	0.11	10.33	5.82	0.34	0.04	0.18	99.45	48.58	49.52	1.90
(R)	in scoria	56.88	0.14	26.59	0.72	0.00	0.10	9.40	6.23	0.42	0.05	0.16	100.69	44.39	53.26	2.35
(R)		54.09	0.12	27.31	0.73	0.00	0.10	10.93	5.54	0.33	0.03	0.16	99.33	51.22	46.96	1.82
ACAF36B	Microlites in	56.57	0.13	27.02	0.69	0.01	0.08	9.71	5.98	0.37	0.03	0.16	100.76	46.30	51.61	2.09
	scoria	57.58	0.21	25.57	0.86	0.02	0.11	8.48	6.53	0.54	0.05	0.15	100.12	40.49	56.45	3.06
ACAF29 (C)	Feldspar	68.53	0.01	18.33	0.43	0.01	0.00	0.05	8.07	5.32	0.01	0.01	100.77	0.25	69.56	30.19
(C)	phenocrysts	67.23	0.01	18.54	0.40	0.00	0.00	0.08	7.76	5.84	0.01	0.01	99.89	26.98	48.82	24.21
(C)	in obsidian	67.11	0.01	18.96	0.37	0.00	0.00	0.11	7.83	5.82	0.00	0.01	100.23	0.53	66.79	32.68
(C)		67.86	0.01	18.70	0.27	0.00	0.00	0.15	8.68	4.69	0.01	0.01	100.39	0.72	73.26	26.02
(R)		68.36	0.02	18.56	0.60	0.01	0.00	0.20	8.11	4.64	0.00	0.01	100.51	0.99	71.91	27.10
(R)		67.55	0.01	18.98	0.29	0.00	0.00	0.10	8.32	5.36	0.01	0.00	100.60	0.44	69.92	29.63
(R)		67.74	0.01	18.76	0.30	-0.01	0.00	0.14	8.38	4.77	0.01	0.01	100.11	0.69	72.27	27.04
(R)		67.55	0.01	18.92	0.30	0.00	0.00	0.13	8.65	4.81	0.00	0.01	100.39	0.59	72.77	26.64
ACAF37 (C)	Feldspar	68.17	0.01	18.72	0.31	0.01	0.00	0.12	7.93	5.75	0.01	0.02	101.04	0.55	67.33	32.12
(C)		67.52	0.01	18.98	0.27	0.00	0.00	0.09	7.66	5.98	BDL	0.01	100.49	0.41	65.81	33.77
(C)		67.11	0.01	18.99	0.30	0.00	0.00	0.10	7.77	5.92	0.02	0.02	100.22	0.48	66.29	33.23
(C)		67.53	0.01	18.90	0.29	0.00	0.00	0.11	7.87	5.76	0.01	0.01	100.49	0.52	67.16	32.32
(C)		66.56	0.01	18.93	0.33	0.00	0.00	0.10	7.94	5.80	0.01	0.00	99.68	0.45	67.22	32.32
(C)		67.04	0.01	18.75	0.31	0.00	0.00	0.13	7.79	5.81	0.00	0.01	99.84	0.60	66.70	32.70
(C)		67.05	0.01	18.66	0.37	0.00	0.00	0.09	7.59	5.86	0.01	0.01	99.66	0.45	66.01	33.54
(C)		66.89	0.01	18.95	0.27	0.00	0.00	0.11	7.82	5.97	0.02	0.01	100.05	0.53	66.19	33.28
(C)		67.60	0.01	19.12	0.35	0.00	0.00	0.08	7.89	6.00	0.00	0.01	101.06	0.36	66.41	33.23
(C)		66.88	0.01	18.95	0.27	0.00	0.00	0.14	7.69	5.88	0.01	0.01	99.85	0.68	66.07	33.25
(R)		67.64	0.01	18.90	0.34	0.00	0.00	0.19	8.35	5.22	-0.01	0.02	100.65	0.87	70.24	28.88
(R)		67.73	0.01	18.99	0.38	0.01	0.00	0.11	7.82	6.03	0.01	0.01	101.10	0.52	66.01	33.47
(R)		67.12	0.01	19.04	0.30	0.00	0.00	0.09	8.14	5.66	0.00	0.01	100.36	0.41	68.34	31.25

Table 4 continued

Sample number		SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	BaO	SrO	Total	An (%)	Ab (%)	Or (%)
ACAF37 (R)	Feldspar	66.96	0.01	18.95	0.31	0.00	0.00	0.12	7.89	5.61	0.02	0.01	99.87	0.59	67.73	31.68
(R)	phenocrysts	67.58	0.01	19.46	0.31	0.00	0.00	0.15	8.05	5.55	0.01	0.02	101.15	0.71	68.31	30.98
(R)	in obsidian	67.65	0.01	19.26	0.28	0.00	0.00	0.09	7.89	5.65	0.00	0.01	100.83	0.42	67.70	31.88
(R)		67.39	0.01	18.87	0.32	0.00	0.00	0.10	7.97	5.70	0.00	0.00	100.38	0.49	67.66	31.84
(R)		67.02	0.01	19.11	0.30	0.00	0.00	0.10	7.83	5.77	0.01	0.01	100.16	0.48	67.05	32.47
(R)		67.42	0.01	19.01	0.31	0.00	0.00	0.07	7.84	5.74	0.02	0.01	100.44	0.34	67.28	32.38
(R)		67.91	0.01	18.77	0.33	0.00	0.00	0.12	8.08	5.49	0.01	0.01	100.72	0.54	68.74	30.72
ACAFB (C)	Feldspar	53.72	0.09	28.42	0.57	0.00	0.08	11.24	5.27	0.28	0.02	0.14	99.83	53.24	45.18	1.58
(C)	phenocrysts	53.58	0.08	28.13	0.51	0.01	0.07	11.13	5.29	0.29	0.03	0.15	99.26	52.90	45.46	1.64
(C)	in scoria	54.28	0.09	27.82	0.57	0.01	0.07	11.04	5.39	0.28	0.02	0.14	99.71	52.26	46.15	1.59
(C)		55.01	0.10	27.49	0.59	0.01	0.07	10.31	5.84	0.32	0.02	0.14	99.88	48.50	49.73	1.77
(C)		55.12	0.08	26.97	0.58	0.01	0.06	10.04	5.91	0.37	0.03	0.15	99.32	47.39	50.51	2.10
(C)		54.29	0.08	28.47	0.52	0.01	0.07	11.02	5.28	0.28	0.01	0.14	100.16	52.71	45.71	1.58
(R)		53.58	0.09	27.83	0.65	0.01	0.07	11.05	5.40	0.29	0.03	0.14	99.14	52.18	46.18	1.64
(R)		55.64	0.08	27.75	0.54	0.00	0.08	10.39	5.75	0.32	0.02	0.15	100.72	49.07	49.13	1.80
(R)		54.09	0.11	27.72	0.69	0.01	0.08	10.69	5.67	0.33	0.05	0.17	99.62	50.06	48.08	1.86
(R)		54.81	0.11	26.65	0.71	0.01	0.09	9.90	6.03	0.36	0.04	0.18	98.88	46.62	51.37	2.01
(R)		54.83	0.09	28.09	0.56	0.01	0.07	11.08	5.35	0.30	0.02	0.15	100.55	52.45	45.83	1.72

Table 5: Major element analyses of oxides in scoria and glass.

Sample number		SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	Cr_2O_3	NiO	ZnO	Total
ACAF36B	Scoria	1.44	17.40	2.51	63.46	0.46	2.51	0.02	0.00	0.04	87.64
ACAF36B		0.20	22.90	1.99	65.62	0.44	1.99	0.02	0.01	0.05	92.10
ACAF36B		1.66	22.98	2.43	65.75	0.59	2.43	0.02	0.00	0.05	94.74
ACAF36B		0.23	22.23	2.42	66.53	0.48	2.42	0.01	0.00	0.07	92.80
ACAF24	Glass	0.06	45.18	0.03	50.87	2.92	0.33	BDL	BDL	0.21	99.60
ACAF24		0.10	47.95	0.03	45.09	2.56	0.14	0.00	0.01	0.13	96.03
ACAF24		0.07	52.00	0.03	42.64	2.44	0.15	BDL	BDL	0.13	97.46
ACAF32_3	Glass	0.11	48.96	0.24	44.06	0.96	0.28	0.01	BDL	0.11	94.71
ACAF32_3		0.05	50.17	0.06	43.91	1.45	0.18	0.01	0.00	0.15	95.98
ACAF32_3		0.08	46.42	0.16	45.77	0.95	0.32	0.01	BDL	0.09	93.80
ACAF32_3		0.07	51.57	0.05	41.91	1.61	0.19	BDL	BDL	0.15	95.54
ACAF32_3		0.55	41.84	0.41	48.61	0.72	0.45	0.01	BDL	0.07	92.64
ACAF32_3		0.07	37.94	0.07	54.93	1.65	0.22	0.02	0.00	0.17	95.07