

68516
Glass and Impact Melt Breccia
34 grams



Figure 1: Photo of 68516. Cube is 1 cm. S77-29898

Introduction

68516 is a rake sample collected from station 8 soil in an area thought of have disturbance from South Ray Crater – see section on 68501. The age has been determined – 3.8 b.y.

Petrography

68516 is a mix of dark glass and grey impact melt clasts (figure 1). Both lithologies are aphanitic and it isn't worth showing a thin section picture (figure 2). There are a few clasts of shocked plagioclase.

Chemistry

Several analyses of 68516 show that it is heterogeneous (figure 3). The analysis by Palme et al. (1978) appears to be of one of the grey clasts.

Radiogenic age dating

Schaeffer and Schaeffer (1977) determined a Ar/Ar plateau age of 3.80 ± 0.05 b.y.

Cosmogenic isotopes and exposure ages

Schaeffer and Schaeffer (1977) determined an exposure age of 50 m.y. by the ^{38}Ar method.

Processing

There are 3 thin sections of 68516.

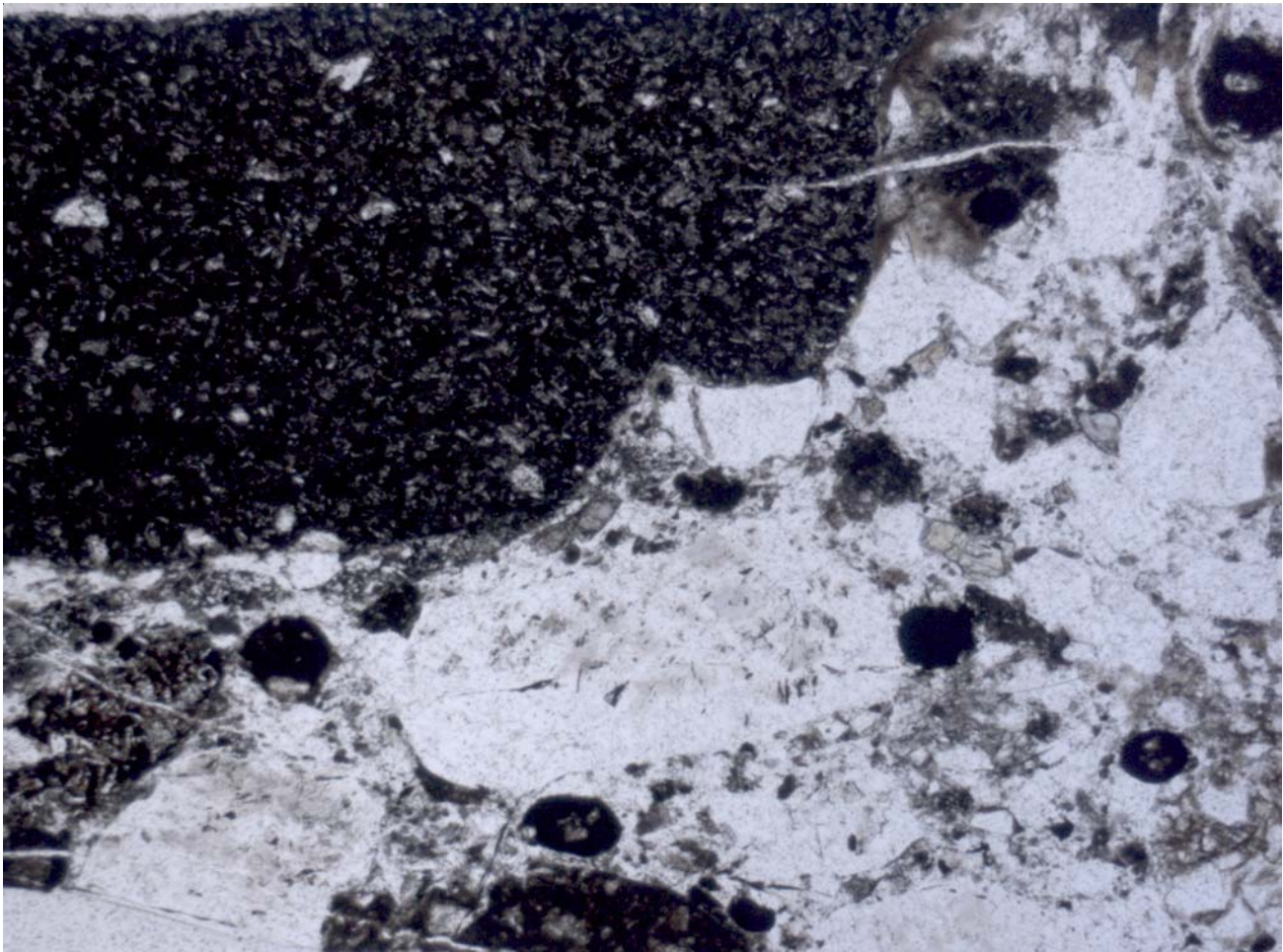


Figure 2: Photomicrograph of thin section of 68516. 2 mm across

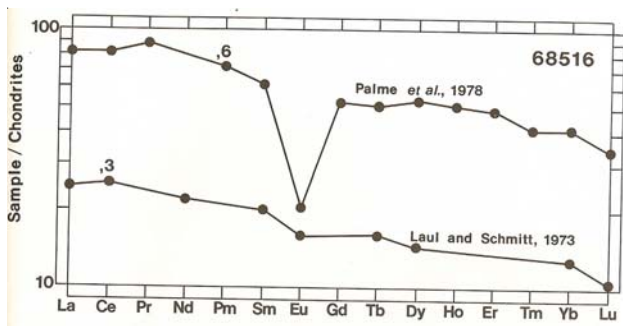


Figure 3: Normalized rare-earth-element diagram for 68516.

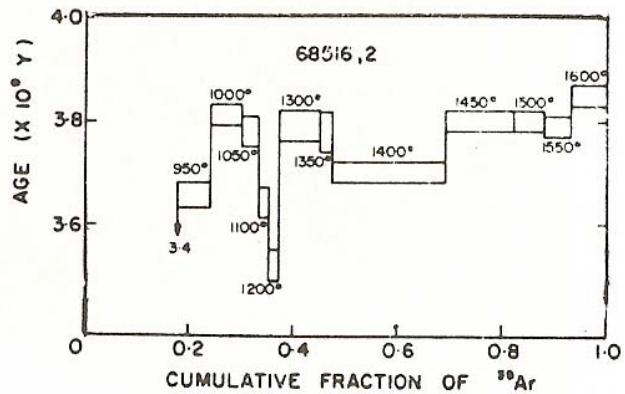


Figure 4: Ar/Ar plateau diagram for 68516 (Scheffer and Schaeffer 1977).

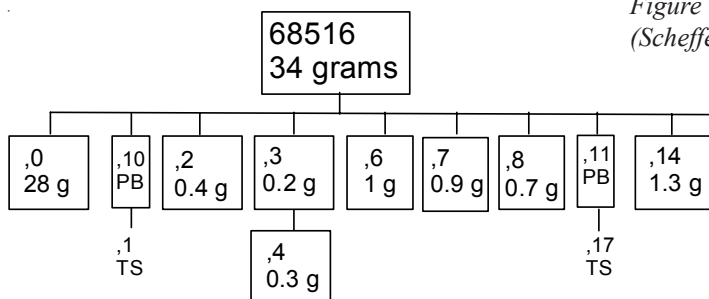


Table 1. Chemical composition of 68516

	glass			anor
reference	Morris86	Laul73	Palme78	See86
weight	See86			
SiO ₂ %	44.43	(d)	45.8	(c) 43.2
TiO ₂	0.35	(d) 0.35	(a) 0.77	(c) 0.35
Al ₂ O ₃	28.7	(d) 28.1	(a) 22.6	(c) 28.1
FeO	4.28	(d) 4.8	(a) 8.18	(c) 4.8
MnO		0.057	(a) 0.09	(c) 0.06
MgO	5.34	(d) 7	(a) 10.46	(c) 7
CaO	15.95	(d) 15.9	(a) 13	(c) 15.9
Na ₂ O	0.41	(d) 0.434	(a) 0.5	(c) 0.43
K ₂ O	0.12	(d) 0.08	(a) 0.17	(c) 0.08
P ₂ O ₅			0.3	(c)
S %			0.1	(c)
sum				
Sc ppm	7.26	(a) 6.8	(a) 11.1	
V		15	(a)	
Cr	623	(a)	1095	(a)
Co	18	(a) 34	(a) 83	(a)
Ni	238	(a) 520	(a) 1348	(a)
Cu			7.2	(a)
Zn			4	(a)
Ga			4.3	(a)
Ge ppb			5.1	(b)
As			431	(b)
Se			300	(b)
Rb			5.2	(a)
Sr			165	(a)
Y			91	(a)
Zr		95	(a) 365	(a)
Nb			23	(a)
Mo				
Ru				
Rh				
Pd ppb			120	(b)
Ag ppb				
Cd ppb			100	(b)
In ppb				
Sn ppb				
Sb ppb				
Te ppb				
Cs ppm			0.22	(a)
Ba	160	(a) 70	(a) 253	(a)
La	15.44	(a) 8.2	(a) 26.7	(a)
Ce	53.8	(a) 22	(a) 72	(a)
Pr			9.4	(a)
Nd		13	(a) 43	(a)
Sm	7.53	(a) 3.6	(a) 11	(a)
Eu	1.29	(a) 1.1	(a) 1.4	(a)
Gd			13	(a)
Tb	1.36	0.76	(a) 2.38	(a)
Dy		4.2	(a) 15.3	(a)
Ho			3.51	(a)
Er			9.44	(a)
Tm			1.28	(a)
Yb	4.67	(a) 2.5	(a) 8.45	(a)
Lu	0.73	(a) 0.36	(a) 1.16	(a)
Hf	5.73	(a) 2.5	(a) 8.64	(a)
Ta	0.61	(a) 0.27	(a) 1.03	(a)
W ppb			0.69	(b)
Re ppb			3.3	(b)
Os ppb			54	(b)
Ir ppb		10	(a) 35	(b)
Pt ppb			130	(b)
Au ppb		11	(a) 32	(b)
Th ppm	3.13	(a) 1.3	(a) 3.55	(a)
U ppm	1.08	(a) 0.4	(a) 1.02	(a)

technique: (a) INAA, (b) RNAA, (c) mixed, (d) elec. Probe

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