67567 – 11.5 grams
67568 – 11 grams
67569 – 7.3 grams
Vesicular Glass

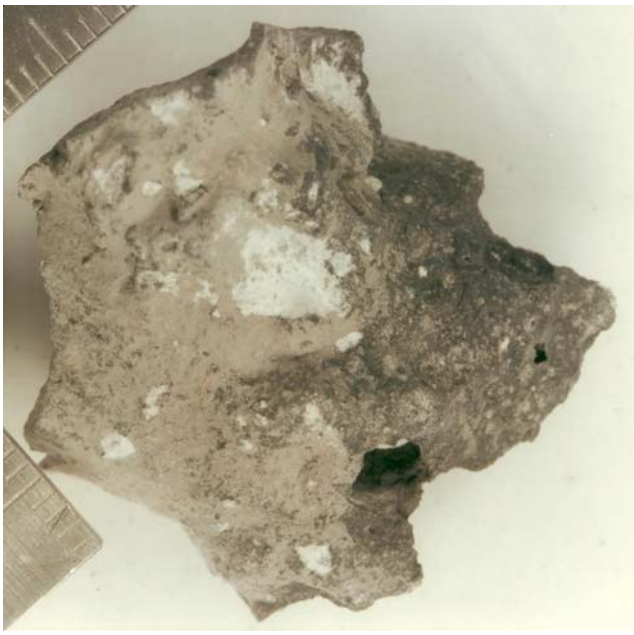

Figure 1: 67567. Mm scale. S72-51261 with soil line and zap pits.

Figure 2: 67568. Vesicular glass with white inclusions. Scale in mm. S72-51055

Figure 3: Yet another glass particle from NRC. S72-51050

Introduction

It should be remembered that regolith processes are ongoing and that there have been many cratering events (large and small) since the Cataclysm. These three glass-laden fragments were collected along with the rake sample from NRC – see section on 67481. One of them has been dated at about 0.8 b.y.

Petrography

Borchardt et al. (1986) have studied glass particles from North Ray Crater. In many cases the glas is devitrified.

Chemistry

The composition of these particles has been determined (see table).

Radiogenic age dating

Deutsch and Stoffler (1987) and Borchardt et al. (1986) reported an Ar/Ar age of 0.84 b.y. for 67567.

Cosmogenic isotopes and exposure ages

Borchardt et al. (1986) reported a cosmic ray exposure age of 7 m.y.

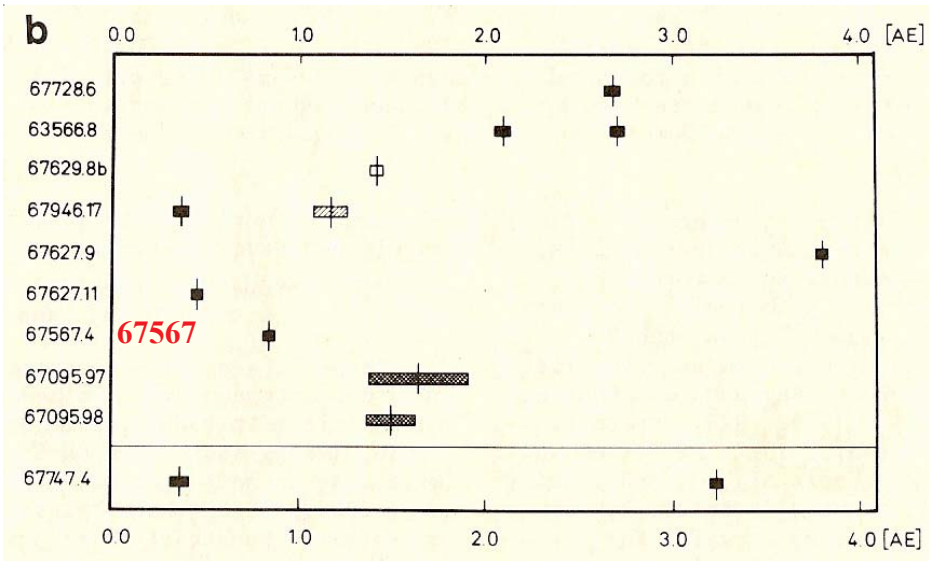

Figure 4: "Ages" obtained by a lot of hard work (Stoffler et al. `1985).

References for 67567

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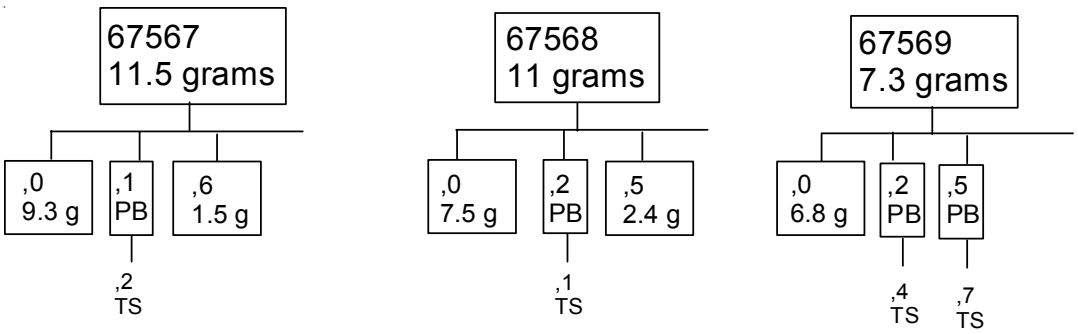

Table 1. Chemical composition of 67567, 67568 and 67569.

	67567		67567		67568	67568		67569	
reference	Borchardt86		Borchardt86					Morris86	
weight	Stoffler85				Stoffler85				
SiO2 %	43.4	43.2			43.8			45.22	(a)
TiO2	0.16	0.13			0.69			0.36	(a)
Al2O3	27.4	28.9			27.3			28.7	(a)
FeO	5.1	5	6	(b)	5.3	5.42	(b)	4.03	(b)
MnO	0.03	0.07			0.03				
MgO	6.4	5.9			6.8			5.04	(a)
CaO	15.2	16.4	15.1	(b)	15.4	15.8	(b)	16	(a)
Na2O	0.46	0.53	0.51	(b)	0.48	0.55	(b)	0.46	(a)
K2O	0.11	0.1			0.13			0.06	(a)
P2O5	0.04	0.03			0.07				
S %									
sum									
Sc ppm			5.05	(b)		9.33	(b)	6.83	(b)
V									
Cr			893	(b)		670	(b)	576	(b)
Co			79.2	(b)		20	(b)	13	(b)
Ni			1560	(b)		260	(b)	185	(b)
Cu									
Zn			18	(b)			(b)		
Ga			3.9	(b)			(b)		
Ge ppb									
As			0.18	(b)			(b)		
Se									
Rb			2.6	(b)			(b)		
Sr			120	(b)		250	(b)		
Y									
Zr			91	(b)			(b)		
Nb									
Mo									
Ru									
Rh									
Pd ppb									
Ag ppb									
Cd ppb									
In ppb									
Sn ppb									
Sb ppb									
Te ppb									
Cs ppm			0.1	(b)			(b)		
Ba			76	(b)		170	(b)	85	(b)
La			6.82	(b)		13.3	(b)	5.9	(b)
Ce			17.9	(b)		37	(b)	16.3	(b)
Pr			2.8	(b)			(b)		
Nd			11.1	(b)		13.8	(b)		
Sm			3.07	(b)		5.73	(b)	2.85	(b)
Eu			0.89	(b)		1.34	(b)	1.25	(b)
Gd			3.8	(b)			(b)		
Tb			0.616	(b)		1.13	(b)	0.51	(b)
Dy			3.93	(b)			(b)		
Ho			0.85	(b)		1.7	(b)		
Er									
Tm			0.38	(b)			(b)		
Yb			2.17	(b)		4.04	(b)	2.11	(b)
Lu			0.3	(b)		0.57	(b)	0.29	(b)
Hf			2.33	(b)		4.33	(b)	2.09	(b)
Ta			0.28	(b)		0.49	(b)	0.27	(b)
W ppb			0.3	(b)			(b)		
Re ppb									
Os ppb									
Ir ppb			54.4	(b)		7.4	(b)		
Pt ppb									
Au ppb			20.4	(b)		6.7	(b)		
Th ppm			1	(b)		1.7	(b)	0.92	(b)
U ppm			0.28	(b)		0.52	(b)	0.31	(b)

technique: (a) e. probe, (b) INAA