

10082
Regolith Breccia
50.5 grams



Figure 1: Photo of 10082,1 with white clast. NASA S76-20463. Note the rounded surface due to meteorite bombardment. NASA S76-20463. Sample is about 5 cm.

Introduction

10082 is a typical Apollo 11 regolith breccias, made up out of components found in the Apollo 11 soil. The top surface is rounded and covered with numerous micrometeorite “zap” pits (figure 1). However, it is a coherent rock.

Petrography

Simon et al. (1984) included breccia 10082 in their comprehensive study of Apollo 11 regolith breccias – their mode is given in the table. They calculated that it had about 24 % highland component, but couldn’t directly identify that many clasts of highland rock.

Simon’s Mode for 10082

	S	L
Mare Basalt	6.1	4.3
Highland Component	0.2	0.2
Regolith breccia	1.1	0.5
Agglutinate	12	6.6
Pyroxene	5.3	0.3
Olivine	0.4	
Plagioclase	2.5	0.5
Ilmenite	1.4	
Orange glass	1.5	
Other glass	2.2	0.2
Matrix	54.7 %	

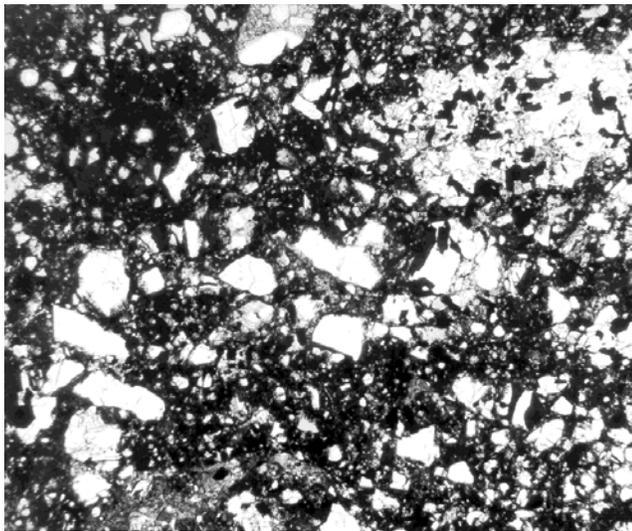


Figure 2: Thin section photomicrograph of 10082,8 showing abundant mineral clasts and less matrix. NASA S76-26284. Scale about 2.5 mm.

Simon et al. noted that 10082 had fewer clasts of highland rock than any of the other regolith breccias they studied. However, the large white clast seen in figure 1 has never been studied!

Chemistry

Rhodes and Blanchard (1981) found that the composition of 10082 was different from the other regolith breccias and 10084 (figure 3 and 4). It has a higher content of FeO – perhaps because the chip analyzed contained a clast of mare basalt.

Processing

Apollo 11 samples were originally described and cataloged in 1969 and “recataloged” by Kramer et al. (1977). There are 3 thin sections.

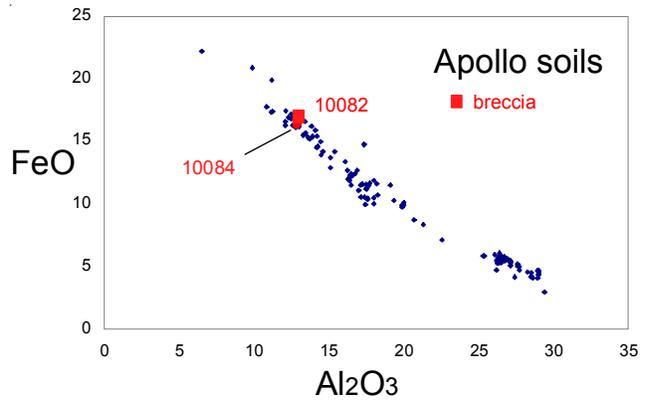
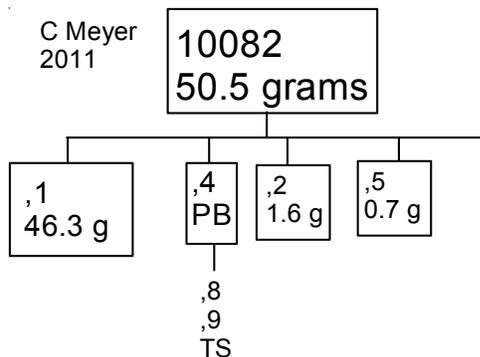


Figure 3: Composition of 10082 compared with that of Apollo soil samples.

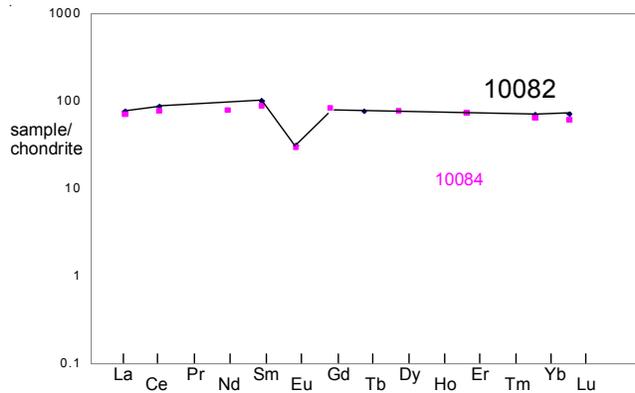


Figure 4: Normalized rare earth element diagram for breccia 10082 compared with soil 10084 (data from Wiesmann et al. 1975).

Table 1. Chemical composition of 10082.

reference weight	Rhodes81	
SiO ₂ %	42.5	(a)
TiO ₂	8.01	(a)
Al ₂ O ₃	12.55	(a)
FeO	16.29	(a)
MnO	0.25	(a)
MgO	7.86	(a)
CaO	11.79	(a)
Na ₂ O	0.46	(a)
K ₂ O	0.19	(a)
P ₂ O ₅	0.15	(a)
S %		
sum		
Sc ppm	62	(b)
V	47	(b)
Cr	2190	(b)
Co	29	(b)
Ni	177	(b)
Cu		
Zn	41	(b)
Ga	8	(b)
Ge ppb		
As		
Se		
Rb	3.6	(b)
Sr	154	(b)
Y	110	(b)
Zr	337	(b)
Nb	19	(b)
Mo		
Ru		
Rh		
Pd ppb		
Ag ppb		
Cd ppb		
In ppb		
Sn ppb		
Sb ppb		
Te ppb		
Cs ppm		
Ba	229	(b)
La	18.1	(b)
Ce	53	(b)
Pr		
Nd		
Sm	14.8	(b)
Eu	1.73	(b)
Gd		
Tb	2.8	(b)
Dy		
Ho		
Er		
Tm		
Yb	11.4	(b)
Lu	1.75	(b)
Hf	10.7	(b)
Ta	1.5	(b)
W ppb		
Re ppb		
Os ppb		
Ir ppb		
Pt ppb		
Au ppb		
Th ppm	2.6	(b)
U ppm		

technique: (a) XRF, (b) INAA

References for 10082

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