

15255 – 240.4 grams

15257 – 22.5 grams

Regolith Breccia

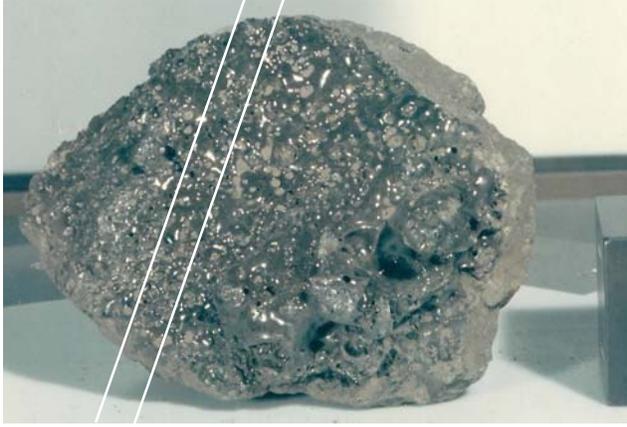


Figure 1a: Photo of glass-covered surface of 15255, showing location of saw cuts. Cube is 1 inch. S71-44511.



Figure 1b: Photo of 15255 with compacted soil attached. Cube is 1 inch. S71-44513.

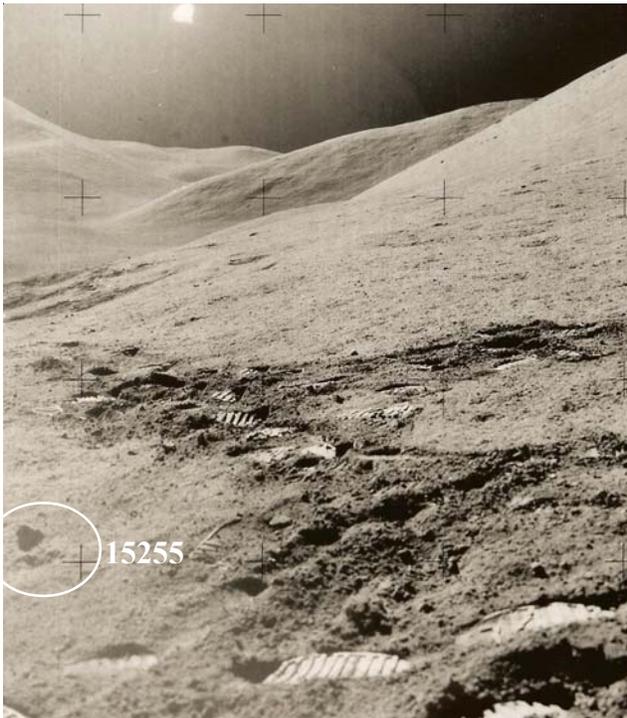


Figure 2: Photo of location of 15255. AS15-85-11516

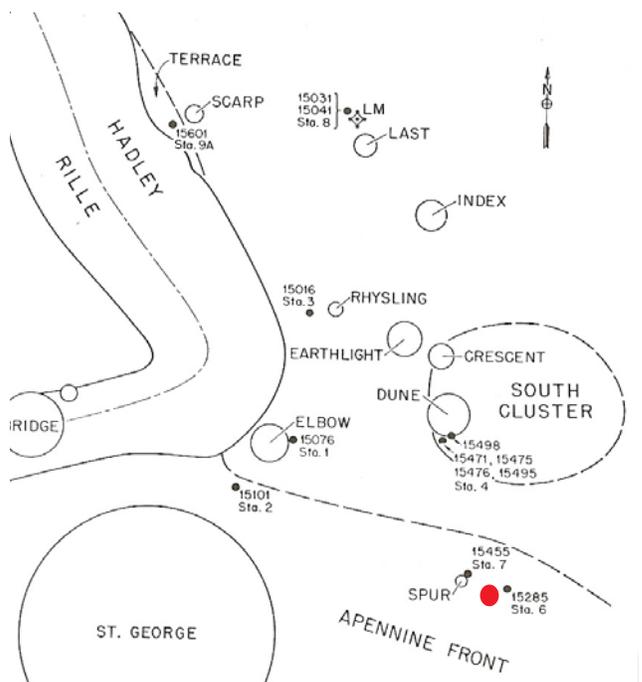


Figure 3: Location of 15255 on map of Apollo 15.

Introduction

These two samples were returned in a bag that also contained a large basalt (15256). They both contain a thin vesicular glass splash on one side (figures 1 and

4). 15257 is clearly part of 15255 that broke off of during transport. This sample was collected at station 6 on the Apennine Front (figures 3 and 4).

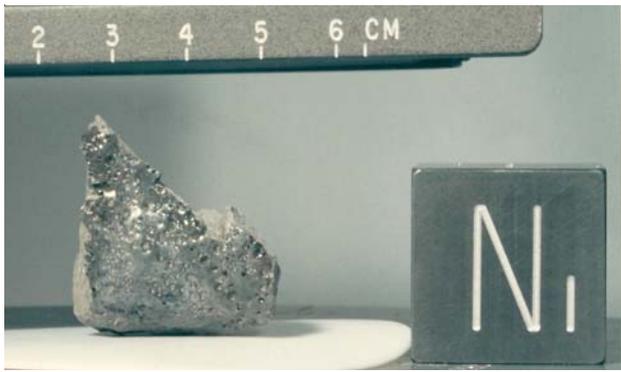


Figure 4 a,b: Two views of 15257 - which is clearly a piece of 15255 from same bag. S71-45814 and 815.

Petrography

15255 and 15257 are a coherent breccia with fine-grained dark matrix (figures 1 and 4). The texture and high content of rare gas confirms that it was a regolith sample. McKay et al. (1989) determined $I_s/FeO = 23$ for 15257.

The mineral mode has not been determined, and in general no petrographic description has been prepared – probably because it is a “typical” regolith breccias. Thin section photomicrographs are available in the catalog by Ryder (1985). *Note: They appear rather “granular” rather than seriate.*

Chemistry

Nava et al. (1977) found that the glass splash was not the same composition as the breccia. McKay et al. (1989) produced an analysis of 15257, which is the same sample (figure 6).

Moore et al. (1973) reported 123 ppm carbon.

Cosmogenic isotopes and exposure ages

Keith et al. (1972) determined the cosmic ray induced activity of $^{22}Na = 43$ dpm/kg, $^{26}Al = 111$ dpm/kg, $^{46}Sc = 4$ dpm/kg, $^{54}Mn = 26$ dpm/kg and $^{56}Co = 11$ dpm/kg.

Other Studies

Bogard determined the rare gas content and isotopic ratios in 15257 (reported in McKay et al. 1989).

Processing

A thin slab was cut from 15255 (figure 1), but it apparently broke into numerous pieces. There are 4 thin sections of 15255 and 2 for 15257.

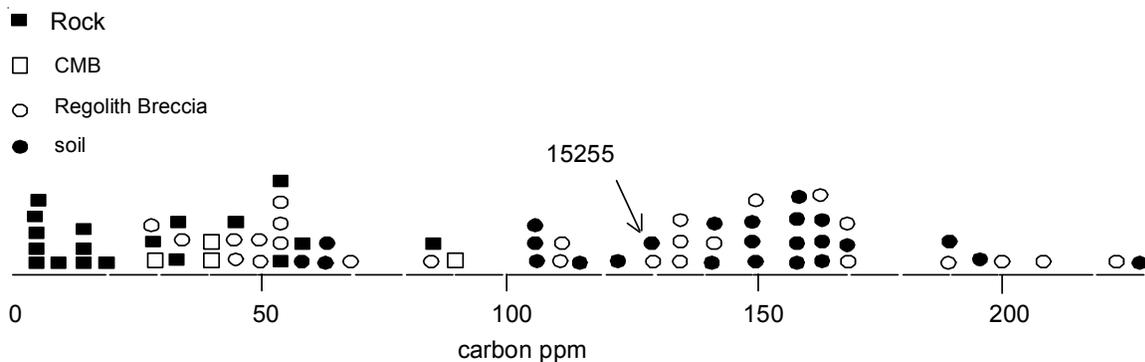


Table 1. Chemical composition of 15255.

reference	15257		McKay89	Keith72	
	Nava77 matrix	glass			
weight					
SiO ₂ %		46.4	(b)		
TiO ₂		1.8	(b)	1.67	(c)
Al ₂ O ₃		14.1	(b)	13.2	(c)
FeO		14.7	(b)	15.5	(c)
MnO		0.22	(b)	0.2	(c)
MgO		11.1	(b)	10.8	(c)
CaO		10.7	(b)	9.5	(c)
Na ₂ O		0.38	(b)	0.39	(c)
K ₂ O		0.16	(b)		0.19 (d)
P ₂ O ₅		0.11	(b)		
S %					
sum					
Sc ppm			29.9		(c)
V			115		(c)
Cr			2840		(c)
Co			43.6		(c)
Ni			164		(c)
Cu					
Zn					
Ga					
Ge ppb					
As					
Se					
Rb	4.91	7.49	(a)		
Sr	122	134	(a)	140	
Y					
Zr	290	501	(a)	280	(c)
Nb					
Mo					
Ru					
Rh					
Pd ppb					
Ag ppb					
Cd ppb					
In ppb					
Sn ppb					
Sb ppb					
Te ppb					
Cs ppm			0.24		(c)
Ba	225	383	(a)	208	(c)
La				20.6	(c)
Ce	35.1	71.5	(a)	54	(c)
Pr					
Nd	35.1	53.9	(a)	32	(c)
Sm	10.2	15	(a)	9.6	(c)
Eu	1.3	1.67	(a)	1.25	(c)
Gd					
Tb			1.96		(c)
Dy	13.5	20	(a)		
Ho					
Er	8.05	12.2	(a)		
Tm					
Yb	7.26	11	(a)	6.7	(c)
Lu	1.11	1.54	(a)	0.94	(c)
Hf	7.9		(a)	7.8	(c)
Ta			0.98		(c)
W ppb					
Re ppb					
Os ppb					
Ir ppb			4.7		(c)
Pt ppb					
Au ppb			1.6		(c)
Th ppm			3.2		(c) 3.5 (d)
U ppm			0.8		(c) 0.92 (d)

technique: (a) IDMS, (b) emp, (c) INAA, (d) radiation count.

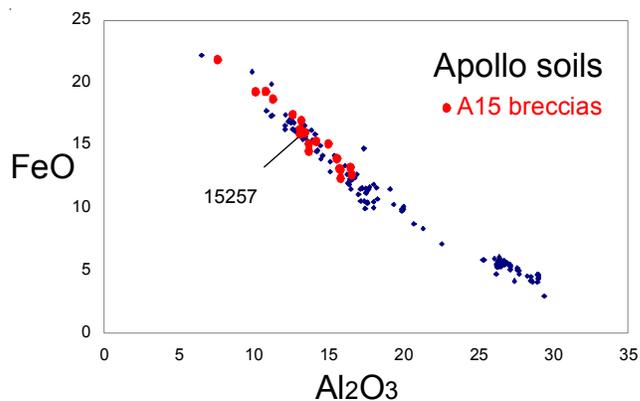


Figure 5: Composition of Apollo soils, Apollo 15 breccias and 15155-7.

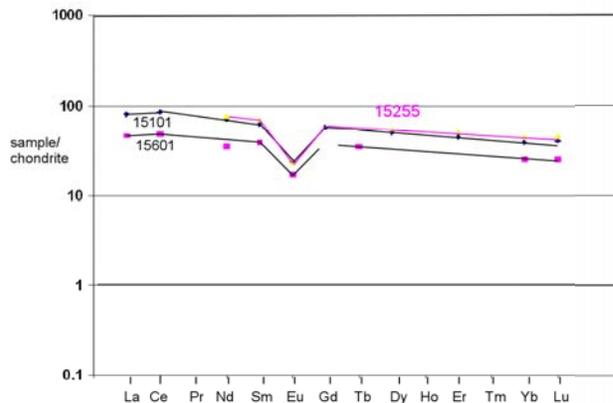
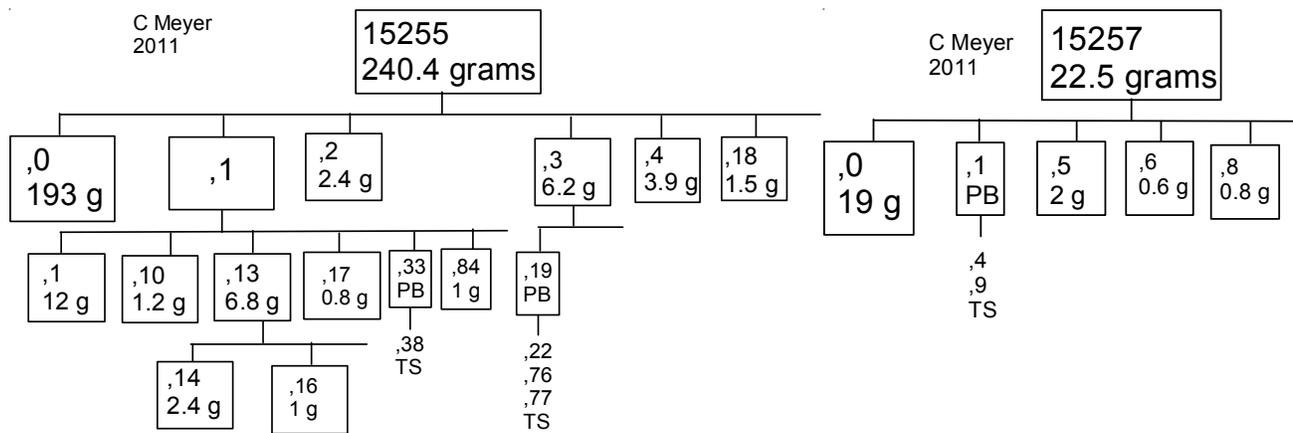


Figure 6: Normalized rare-earth-element content of 15255 compared with Apollo soils.



References for 15255

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