10010

DRAFT

Contingency Soil

491 grams

Figure 1: Photo of a portion of 10010. Spatula about 3 mm wide. S69-45229.

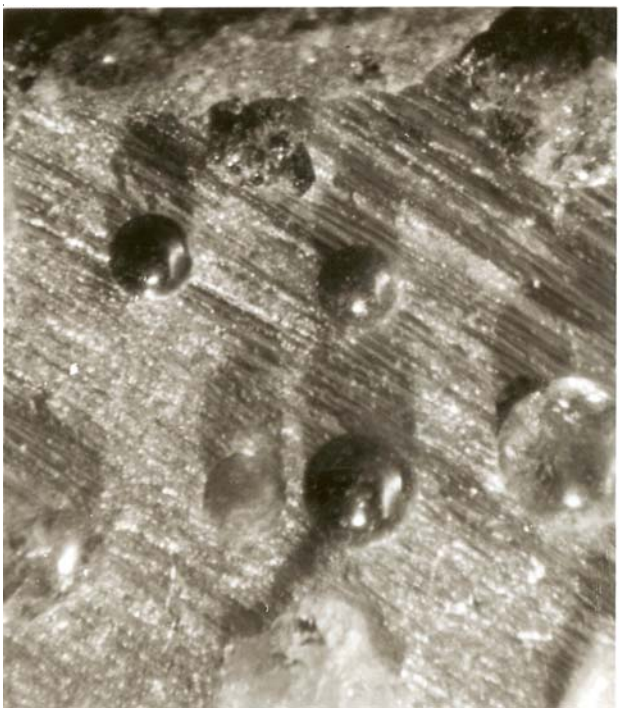


Figure 2: Small glass spheres found in 10010. Largest sphere is 3 mm. S69-45181.

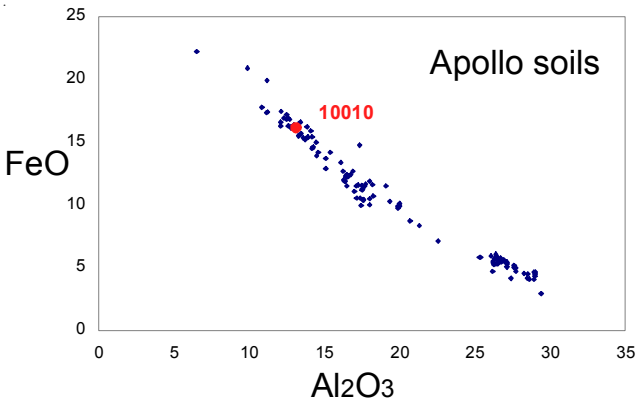


Figure 3: Composition of 10010 compared with other luanr soils.

Introduction

This was the first sample of the Moon (figure 1). It was picked up as soon as Armstrong got off the ladder, placed in a large Teflon bag and put in a pocket in his spacesuit in case he had to immediately get back on board the LM! Several rock samples > 1 cm were included (10021-10032). Total weight 1014 grams!

During PET, Frondel ran a hand magnet through this sample to extract metallic iron particles (King 1969). *Note: the magnetism of 10023 is presumably due to this*

Petrography

10010 is a mature soil with Is/FeO = 75 (Morris 1978). For some reason the grain size distribution and modal mineralogy have not been determined (Carrier 1973). During PET it was noted that the soil contained glass spheres with a variety of color from clear white, to orange, to black (figure 2).

Chemistry

Rhodes and Blanchard (1981) reported an analysis of 10010. It is not significantly different from 10084. Figure 3 shows the composition of the Apollo 11 soils with respect to the other Apollo soils.

Table 1. Chemical composition of 10010.

reference	Rhodes 81	
weight		
SiO2 %	41.5	(a)
TiO2	7.58	(a)
Al2O3	13.21	(a)
FeO	15.83	(a)
MnO	0.24	(a)
MgO	7.82	(a)
CaO	12.05	(a)
Na2O	0.44	(a)
K2O	0.14	(a)
P2O5	0.11	(a)
S %		
sum		
Sc ppm	61	(b)
V	47	(b)
Cr	2080	(b)
Co	29	(b)
Ni	197	(b)
Cu		
Zn	35	(b)
Ga	7	(b)
Ge ppb		
As		
Se		
Rb	3	(b)
Sr	160	(b)
Y	101	(b)
Zr	303	(b)
Nb	19	(b)
Mo		
Ru		
Rh		
Pd ppb		
Ag ppb		
Cd ppb		
In ppb		
Sn ppb		
Sb ppb		
Te ppb		
Cs ppm		
Ba	205	(b)
La	14.9	(b)
Ce	46	(b)
Pr		
Nd		
Sm	12.1	(b)
Eu	1.66	(b)
Gd		
Tb	2.5	(b)
Dy		
Ho		
Er		
Tm		
Yb	9.91	(b)
Lu	1.49	(b)
Hf	9.7	(b)
Ta	1.6	(b)
W ppb		
Re ppb		
Os ppb		
Ir ppb		
Pt ppb		
Au ppb		
Th ppm	1.5	(b)
U ppm		

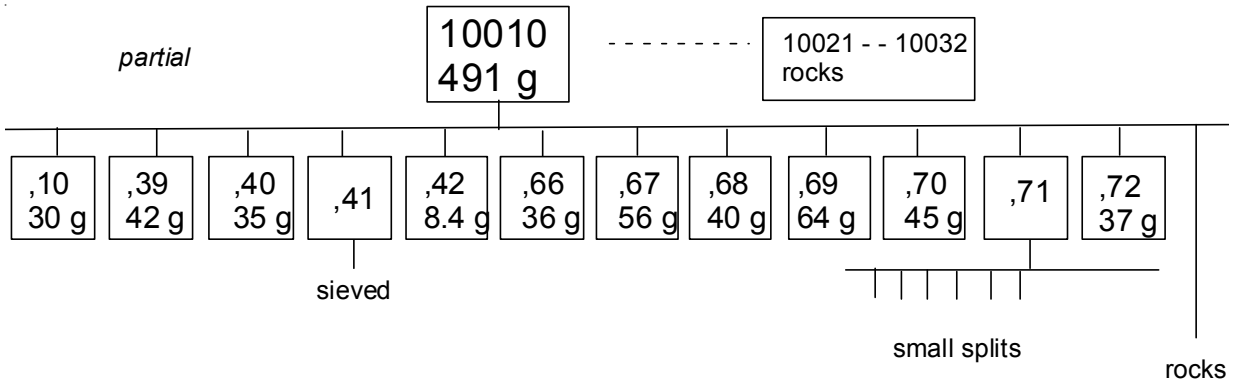
technique: (a) XRF, (b) INAA

Other Studies

Initially, lunar soil samples were of interest to the soil mechanics and biological sciences communities.

Processing

The contingency sample was apparently sieved at 1 cm to extract the > 1 cm rocks – see table.



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Rocks > 1 cm split from 10010.

		wt. gr.
10021	breccia	250
10022	basalt	95.5
10023	breccia	66
10024	basalt	68.12
10025	breccia	8.5
10026	breccia	9.25
10027	breccia	8.87
10028	breccia	3.53
10029	basalt	5.53
10030	breccia	1.81
10031	basalt	2.7
10032	basalt	3.13