62281 and 62290

Soil and bag residue

410 and 28 grams

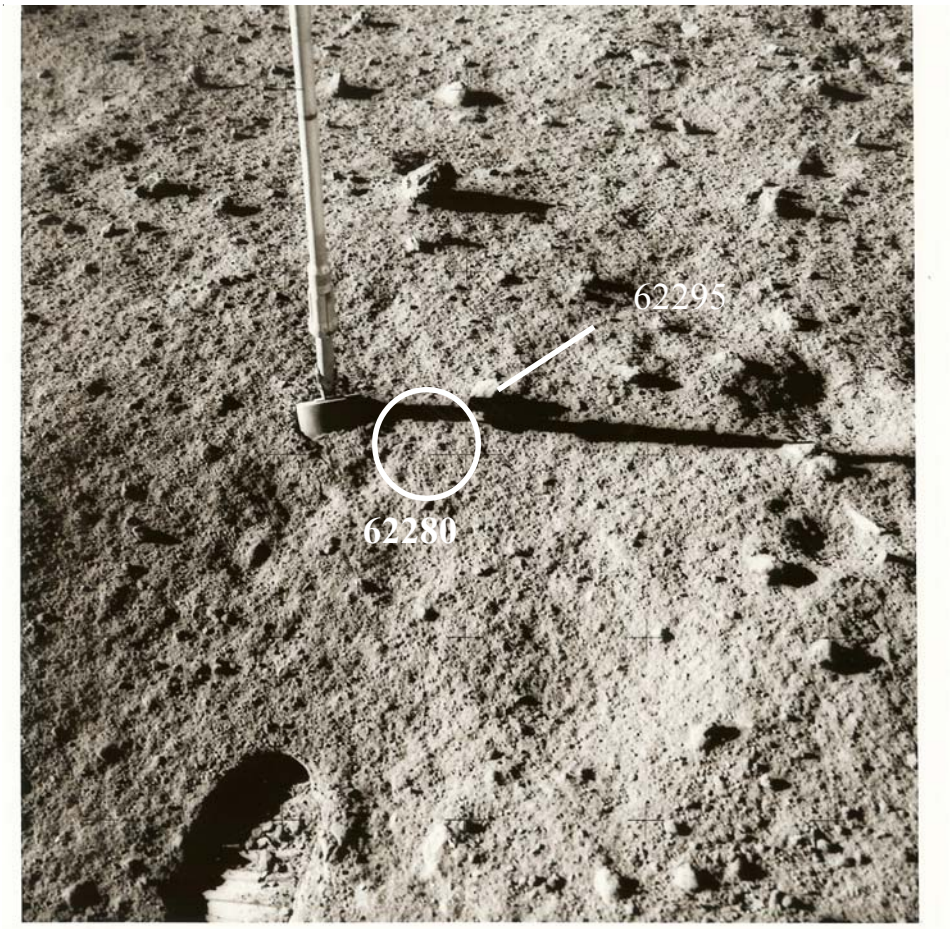


Figure 1: Close-up photo of area where 62280 was collected. AS16-109-17848

Introduction

Lunar soils 62280 and 62290 were collected at station 2 (figures 1 and 2). 62290 is the residue from the bag that was used to return rock sample 62295 and may or may not be a proper soil sample. The deep footprint and abundant fragments in figure 1, indicates the soil was soft and freshly deposited.

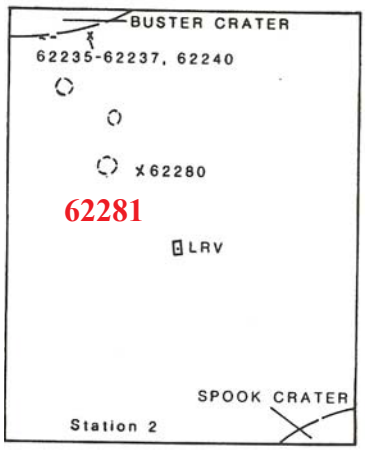


Figure 2: Map of station 2, Apollo 16.

Petrography

The maturity index for 62281 is high I_s/FeO = 76 (Morris 1978). Heiken et al. (1973), vonEngelhardt et al. (1976) and Houck (1982) reported similar mineralogic modes for the size range 90-150 microns, with agglutinate content about 40% (mature). vonEngelhardt also determined the mode as a function of grain size. The average grain size is 135 microns (figure 5).

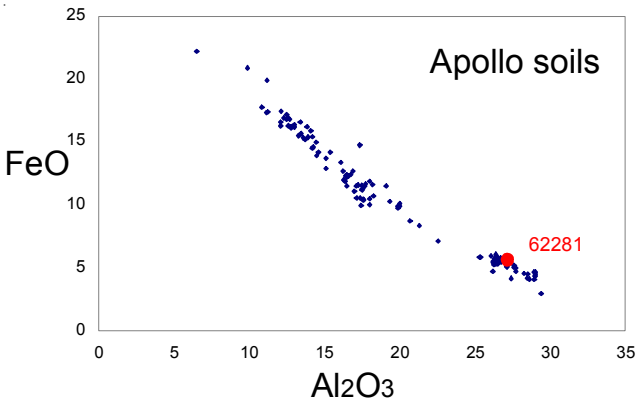


Figure 3: Composition of soil samples collected during Apollo missions, including that of 62281.

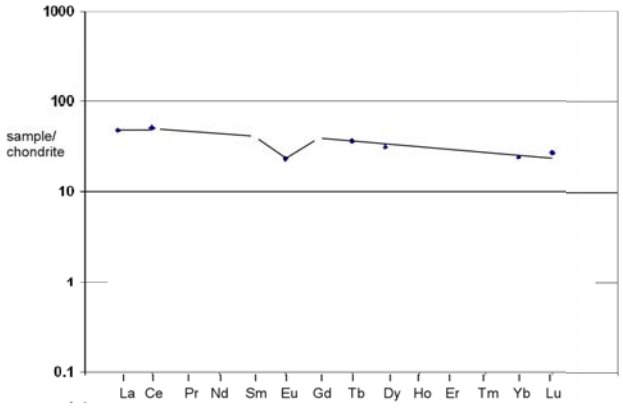


Figure 4: Normalized rare-earth-element diagram for 62281 (Korotev 1981).

Chemistry

Laul and Schmitt (1973) and Boynton et al. (1976) determined the chemical composition (table and figures). Note the high Ni, Ir and Au indicate high meteoritc component. The important elements C and N have not been determined.

Radiogenic age dating

Evenson et al. (1973) and Silver (1973) determined the Sr and Pb isotopic ratios.

Cosmogenic isotopes and exposure ages

Clark and Keith (1973) determined the cosmic-ray-induced activity of $^{26}Al = 225$ dpm/kg, $^{22}Na = 63$ dpm/kg, $^{54}Mn = 2$ dpm/kg, $^{56}Co = 17$ and $^{46}Sc = <7$ dpm/kg.

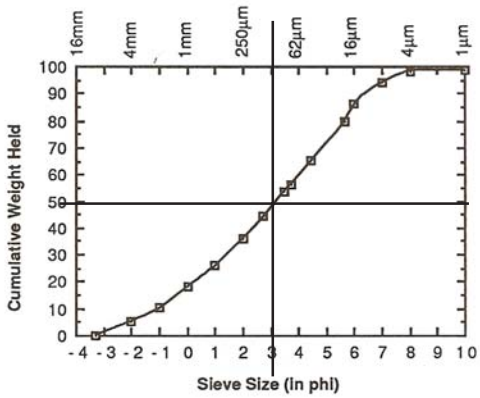
Other Studies

Bhandari et al. (1973) determined the fossil nuclear track density of 62281 and estimated the surface exposure age as only 6 m.y.

Walton et al. (1973) reported a high content of rare gases, consistent with the high maturity.

Processing

There were a few small breccias fragments, but they have apparently not been studied.



average grain size = 132 microns

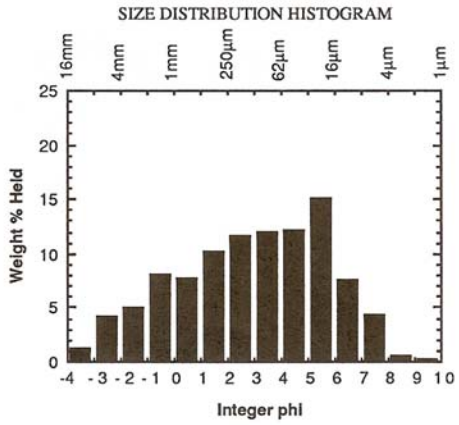


Figure 5: Grain size distribution of 62281 (Graf 1991, data by McKay).

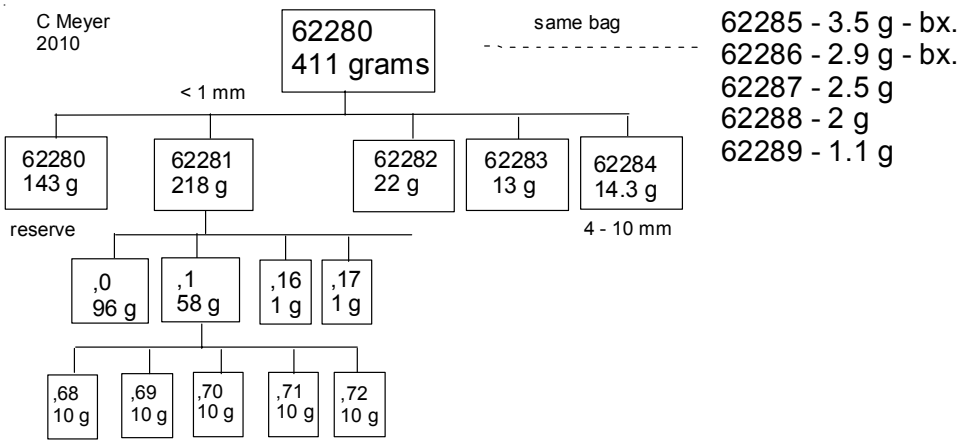
Modal content of soils 62281 (90-150 micron).

	Heiken73	Houck82	Engelhardt
Agglutinates	40	42	36.2
Basalt	0.3	4.1 ?	
Breccia	27.9	27	43.3
Anorthosite	5.6		
Norite	1.3		
Gabbro			
Plagioclase	16	25.7	12.2
Pyroxene	2.2	1	1
Olivine			
Ilmenite		0.3	
Glass other	6.2	3.4	7.1

Table 1. Chemical composition of 62281.

reference	Clark73		Laul73			Boynton76		Evenson73 Silver 73		ave. st. 2 Korotev81
weight										
SiO2 %										44.6
TiO2			0.54	0.6	(b)	0.72	(b)			0.6
Al2O3			27.5	26.7	(b)	27.4	(b)			27
FeO			5.5	5.5	(b)	5.25	(b)			5.5
MnO			0.062	0.067	(b)	0.068	(b)			0.07
MgO			7	6.6	(b)	4.77	(b)			6.05
CaO			15.4	15.9	(b)	15	(b)			15.7
Na2O			0.439	0.467	(b)	0.45	(b)			0.445
K2O	0.11	(a)	0.11	0.12	(b)	0.11	(b)	0.12	(d)	0.112
P2O5										
S %										
sum										
Sc ppm			9	9	(b)	8.9	(b)			9.1
V			16	20	(b)	16	(b)			26
Cr			753	732	(b)	750	(b)			780
Co			23	23	(b)	25.1	(b)			28
Ni			380	380	(b)	321	(c)			380
Cu										
Zn						26.4	(c)			
Ga						5.7	(c)			
Ge ppb						850	(c)			
As										
Se										
Rb								2.95	(d)	3.1
Sr								165	(d)	148
Y										46
Zr			200	150	(b)					170
Nb										
Mo										
Ru										
Rh										
Pd ppb										
Ag ppb										
Cd ppb						108	(c)			
In ppb						24	(c)			
Sn ppb										
Sb ppb										
Te ppb										
Cs ppm										
Ba				130	(b)	130	(b)	134	(d)	130
La			11.6	11.8	(b)	12	(b)			12.1
Ce			27	28	(b)	32	(b)			30.5
Pr										
Nd										
Sm			5.6	5.6	(b)	5.4	(b)			5.5
Eu			1.1	1.2	(b)	1.07	(b)			1.14
Gd										
Tb			0.95	1	(b)	1.1	(b)			1.08
Dy			6.1	6.7	(b)	6.5	(b)			
Ho										
Er										
Tm										
Yb			4.2	4.1	(b)	3.6	(b)			3.9
Lu			0.6	0.58	(b)	0.49	(b)			0.58
Hf			4.4	4.1	(b)	3.2	(b)			3.8
Ta			0.5	0.51	(b)	0.5	(b)			0.5
W ppb										
Re ppb										
Os ppb										
Ir ppb				10	(b)	9.1	(c)			
Pt ppb										
Au ppb				6	(b)	5.9	(c)			
Th ppm	2.1	(a)	1.7	1.9	(b)	1.9	(b)	2.026	(d)	1.8
U ppm	0.62	(a)	0.6	0.65	(b)	0.54	(b)	0.573	(d)	0.56

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



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