62231 and 62241

Soils

112 and 463 grams

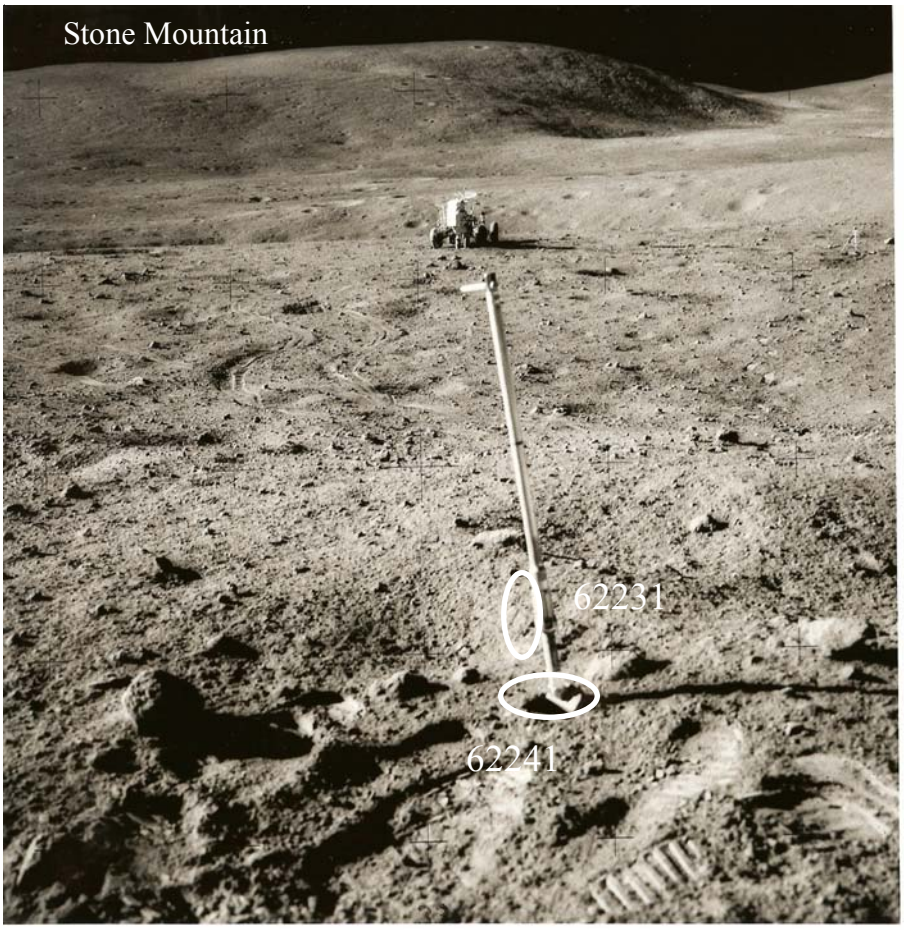


Figure 1: Photo of station 2 on rim of Buster Crater. AS16-109-17841

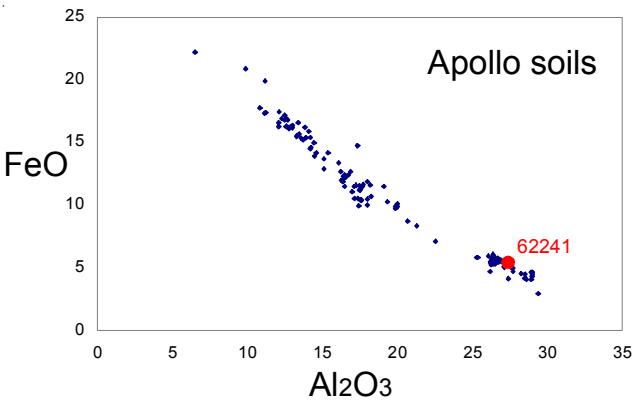


Figure 2: Chemical composition of station 2 soils, at Apollo 16.

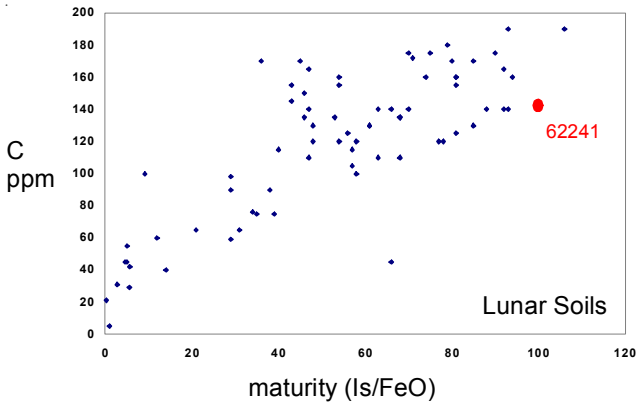


Figure 3: Carbon content and maturity index for 62241.

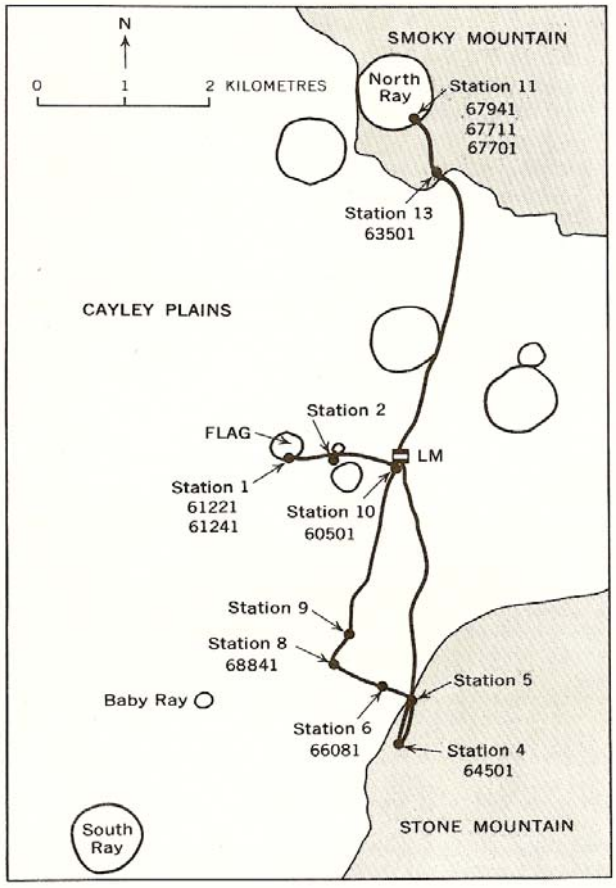


Figure 4: Location of station 2 on Cayley plain.

62231
62241

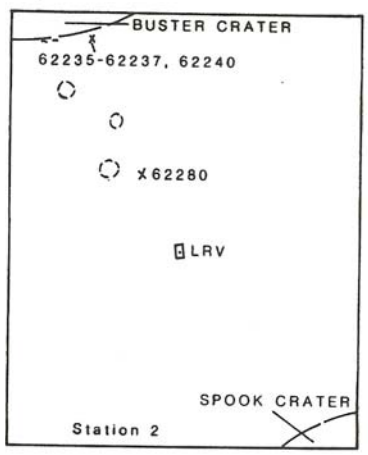


Figure 5: Map of station 2.

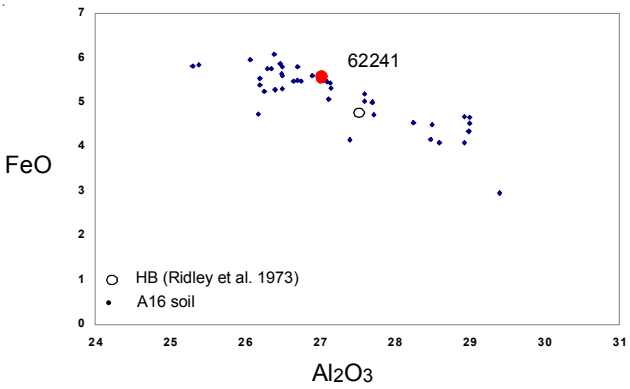


Figure 6: Composition of 62241.

Introduction

62230 and 62240 were collected adjacent to each other (figure 1) from the rim of Buster Crater (Sutton 1981).

Rock samples 62235, 62236, 62237 and 62238 were collected in the immediate vicinity, 62255 was nearby. Samples 62245 – 62249 were sieved from 62240. 62315 is also from this spot (Sutton 1981).

Petrography

Morris (1978) reported the maturity index I_s/FeO = 91 and 100 for 62231 and 62241, respectively. This high maturity is consistent with surface soils at Apollo 16. The grain size distribution has not been reported.

Marvin (1972) cataloged the 4 – 10 mm particles.

Chemistry

Figure 2 shows the composition of 62231 and 62241 in comparison with all other Apollo soil samples and figure 7 shows the rare-earth-element diagram.

desMarais et al. (1973) determined 140 ppm carbon for 62240 (figure 3) and Kerridge et al. (1975) determined 152 ppm carbon and 94 ppm nitrogen.

Cosmogenic isotopes and exposure ages

Eldridge et al. (1973) determined the cosmic-ray-induced activity of 62241 as ^{22}Na = 41 dpm/kg and ^{26}Al = 130 dpm/kg.

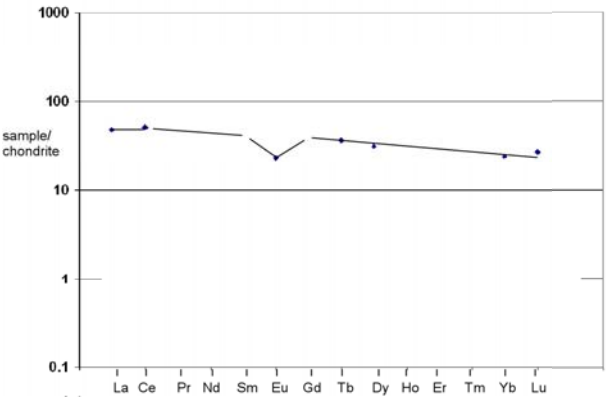


Figure 7: Normalized rare-earth-element diagram for 62231 (Korotev 1982).

Table 1. Chemical composition of 62231.

reference	Korotev82	
weight		
SiO2 %		
TiO2		
Al2O3	26.5	(a)
FeO	5.6	(a)
MnO		
MgO	6.4	(a)
CaO	14.5	(a)
Na2O	0.444	(a)
K2O		
P2O5		
S %		
sum		
Sc ppm	9.28	(a)
V	22	(a)
Cr	731	(a)
Co	35.3	(a)
Ni	485	(a)
Cu		
Zn		
Ga		
Ge ppb		
As		
Se		
Rb		
Sr	165	(a)
Y		
Zr	165	(a)
Nb		
Mo		
Ru		
Rh		
Pd ppb		
Ag ppb		
Cd ppb		
In ppb		
Sn ppb		
Sb ppb		
Te ppb		
Cs ppm	0.14	(a)
Ba	129	(a)
La	11	(a)
Ce	29.7	(a)
Pr		
Nd		
Sm	5.29	(a)
Eu	1.13	(a)
Gd		
Tb	1.13	(a)
Dy		
Ho		
Er		
Tm		
Yb	3.7	(a)
Lu	0.52	(a)
Hf	4.17	(a)
Ta	0.53	(a)
W ppb		
Re ppb		
Os ppb		
Ir ppb	14.8	(a)
Pt ppb		
Au ppb		
Th ppm	1.98	(a)
U ppm	0.48	(a)

technique: (a) INAA

Table 2. Chemical composition of 62241.

reference	Rose73		Bonyton76		Brunfelt73	Eldridge73		ave. st. 2 Korotev81
weight								
SiO2 %	44.65	(a)						44.6
TiO2	0.56	(a)	0.62	(b)	0.58			0.6
Al2O3	27	(a)	26.6	(b)	27.8			27
FeO	5.49	(a)	5.58	(b)	4.76			5.5
MnO	0.07	(a)	0.067	(b)	0.07			0.07
MgO	5.84	(a)	5.47	(b)	9.1			6.05
CaO	15.95	(a)	15.8	(b)	15			15.7
Na2O	0.44	(a)	0.45	(b)	0.51			0.445
K2O	0.13	(a)	0.096	(b)	0.1	0.113	(d)	0.112
P2O5	0.1	(a)						
S %								
sum								
Sc ppm	13.2	(a)	9.7	(b)	8.5			9.1
V	29	(a)	21	(b)	90			26
Cr	890	(a)	810	(b)	790			780
Co	28	(a)	28.4	(b)	24			28
Ni	468	(a)	355	(c)	360			380
Cu	8.8	(a)			6.3			
Zn	33	(a)	22.1	(c)	24			
Ga	3.5	(a)	5.3	(c)	4.4			
Ge ppb			760	(c)				
As								
Se								
Rb					3.1			3.1
Sr	130	(a)						148
Y	46	(a)						46
Zr	166	(a)						170
Nb	11	(a)						
Mo								
Ru								
Rh								
Pd ppb								
Ag ppb								
Cd ppb			85	(c)				
In ppb			19.4	(c)	36			
Sn ppb								
Sb ppb								
Te ppb								
Cs ppm					0.25			
Ba	125	(a)	130	(b)	100			130
La			11.8	(b)	12.1			12.1
Ce			30	(b)	30.8			30.5
Pr								
Nd								
Sm			5	(b)	5.29			5.5
Eu			1.1	(b)	1.43			1.14
Gd								
Tb			1.1	(b)	0.85			1.08
Dy			5.6	(b)	6.4			
Ho								
Er					4.2			
Tm								
Yb			3.8	(b)	3.5			3.9
Lu			0.5	(b)	0.63			0.58
Hf			3.3	(b)	3.3			3.8
Ta			0.4	(b)	0.37			0.5
W ppb								
Re ppb								
Os ppb								
Ir ppb			10.6	(c)				
Pt ppb								
Au ppb			6.2	(c)				
Th ppm			1.8	(b)	1.5	1.7	(d)	1.8
U ppm			0.55	(b)	0.65	0.46	(d)	0.56

technique: (a)'microchemical', (b) INAA, (c) RNAA, (d) rad. Count.

Other Studies

Walton et al. (19730 reported rare gas contents.

Behrmann et al. (1973) determined the density of fossil nuclear tracks in mineral grains from 62241 (figure 8).

Processing

These samples were returned in ALSRC #1.

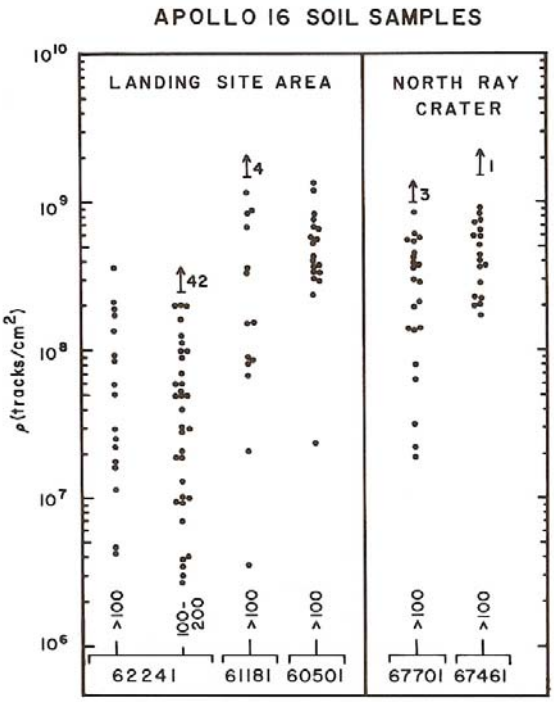
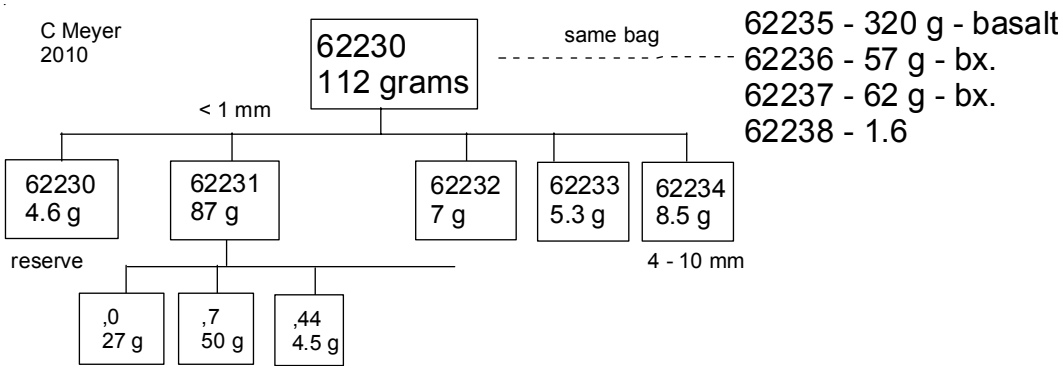
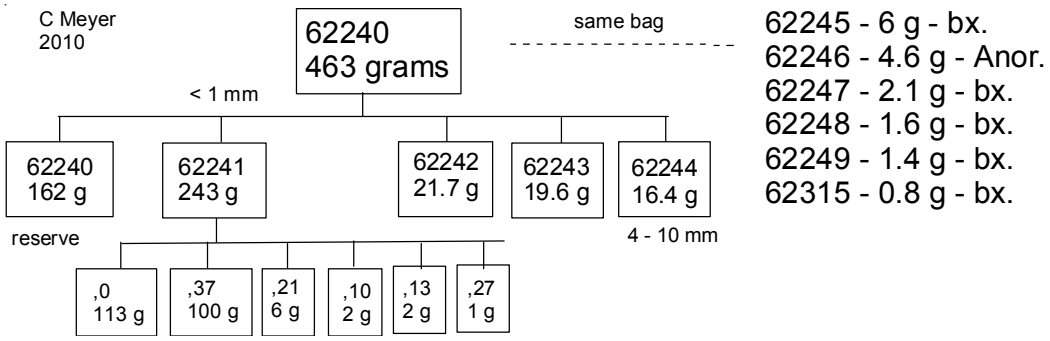


Figure 8: Density of fossil nuclear tracks in Apollo 16 soil samples.(Behrmann et al. 1973).





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