65501 – 618 grams
65510 – 410 grams

Soil and rake residue

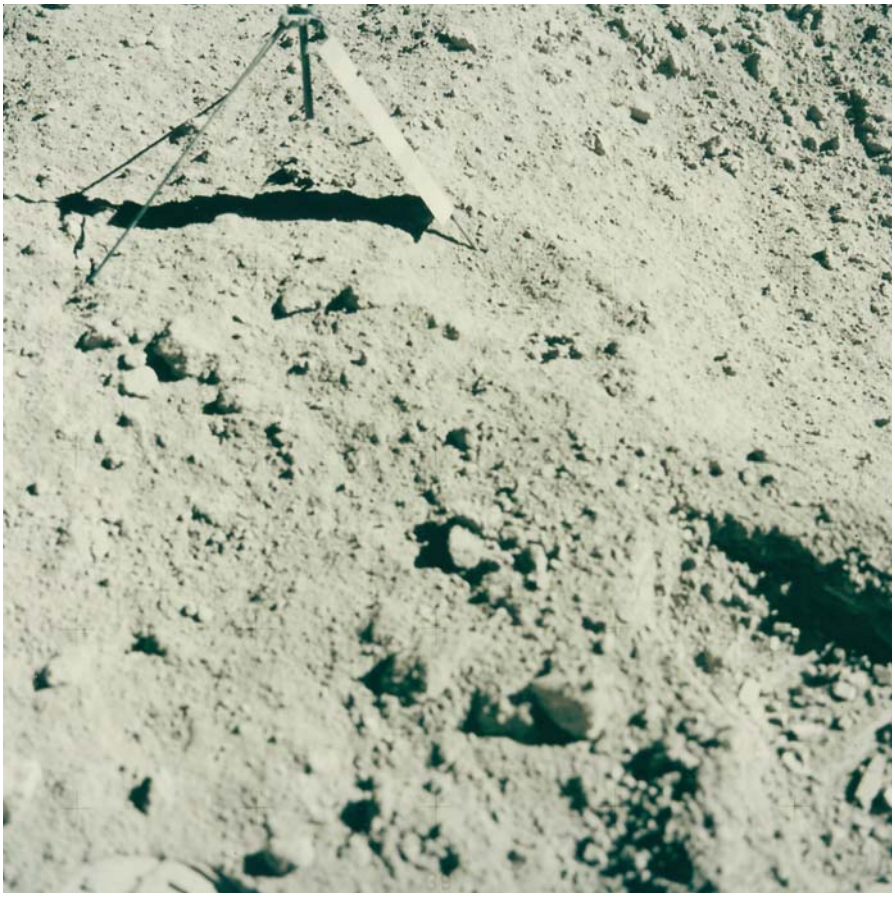
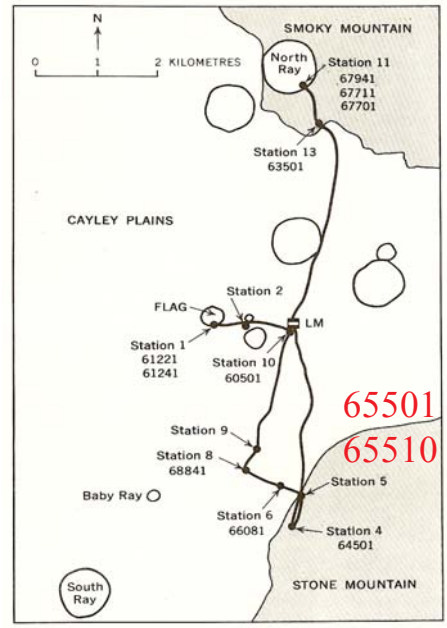
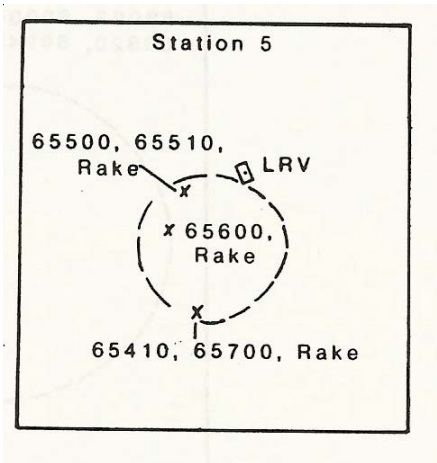


Figure 1: Close-up photo of area where soil 65500 and rake sample 65510 were taken. AS16-107-17493





Figures 2 and 3: Maps of location of 65501 and 65510 at station 5 on Cayley Plain.

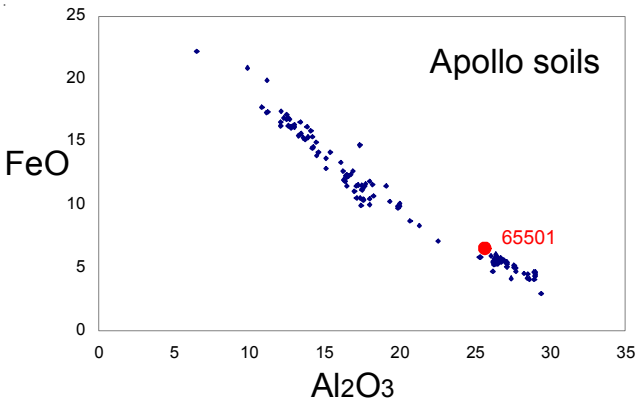


Figure 4: Composition of Apollo soil samples with that of 65501 shown.

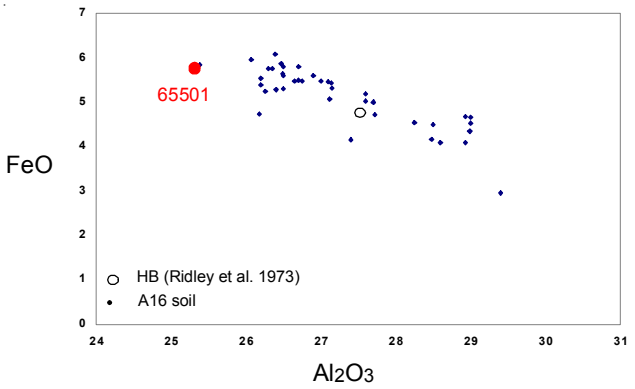


Figure 5: The composition of 65501 is slightly less aluminous.

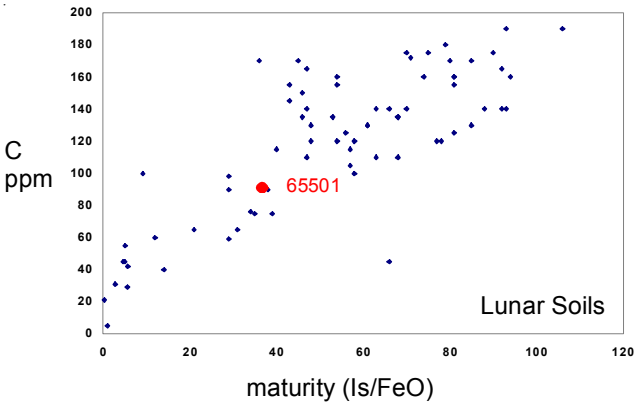


Figure 6: Carbon content and maturiy index for 65501 (Morris 1978;Moore et al. 1973).

Introduction

The astronauts stopped at Station 5 on the way back to the LM, where they collected several rake and soil samples at the base of Stone Mountain (figure 2). 65501 and 65510 contained a high proportion of soil clods (altogether there are 150 grams of soil clods in the rake sample 65510). These can be seen in figure 1.

Petrography

The maturity index for 65501 is low (I_s/FeO = 38). Butler et al. (1973) determined the grain size distribution (figure) and the modal mineralogy. The abundance of fragments of soil clods makes for an unusual distribution of grain size (figure 8) and a high value for the average grain size (149 microns).

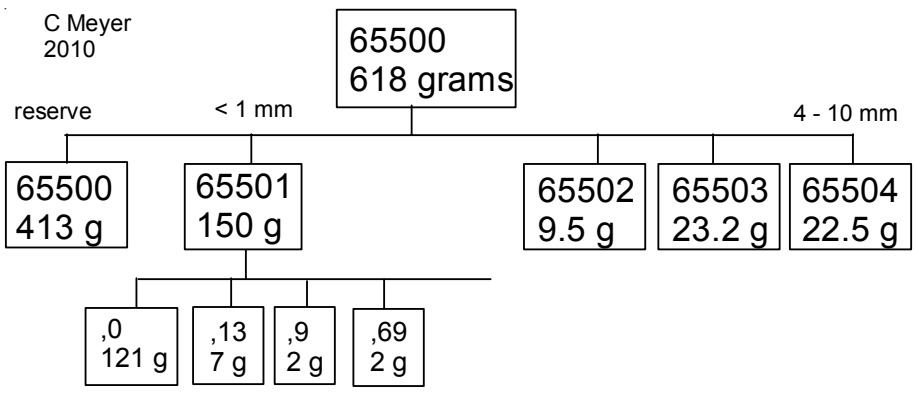
Keil et al. (1972) and Warner et al. (1976) reported on rake samples from 65510. They were mostly soil clods (see figure 1).

Chemistry

Baedecker et al. (1972), Duncan et al. (1973), Nava (1974), Philpotts et al. (1973) and Korotev (1982) all reported analyses of 65501 and 65510 (table 1).

Kerridge et al. (1975a) determined 90 ppm carbon and 60 ppm nitrogen for 65500 (figure 6), while Epstein and Taylor (1973) reported carbon (110 ppm), hydrogen and isotopic ratios for 65513(?). Kothari and Goel (1973) reported 80 ppm nitrogen.

Jovanovic and Reed (1973) determined the halogens, Li, U and Te. Cirlin and Housley (1981) determined the content of Cd (120 ppb) and Zn (22 ppm).



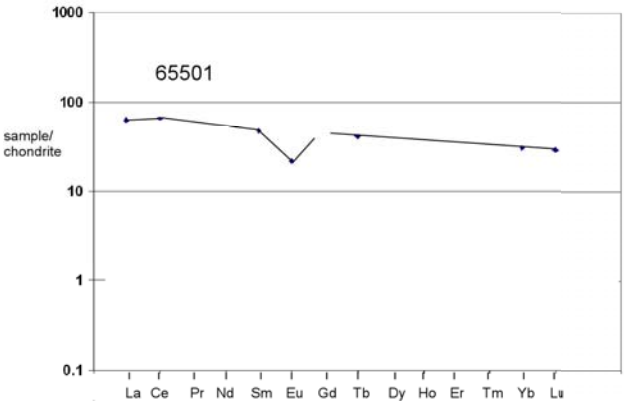


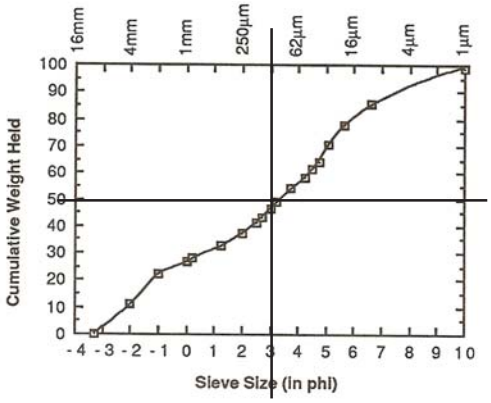
Figure 7: Normalized rare-earth-element diagram for 65501.

Other Studies

Wieler et al. (1980) determined the density of fossil nuclear tracks.

Bogard and Nyquist (1973) and Walton et al. (1973) determined the rare gas content and isotopic ratios for 65501 and 65511.

Becker and Clayton (1977) calculated an exposure age of 510 m.y. from the abundance of ^{15}N and compared this to the 310 m.y. ^{21}Ne age of Walton et al. (1973).



average grain size = 149 microns

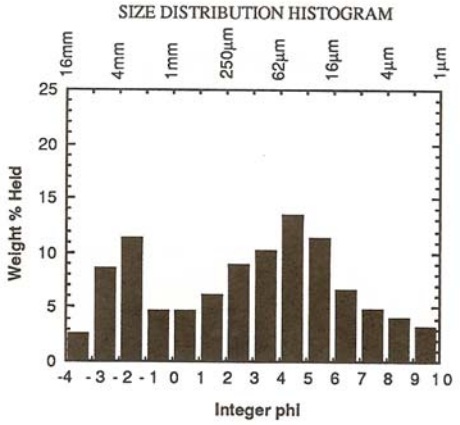
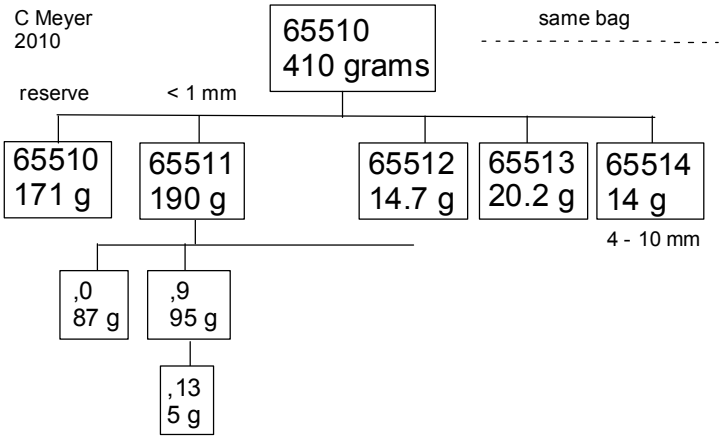


Figure 8: Grain size distribution for 65501 (Graf 1993, from data by Butler et al.).



65515 - 50 g - soil clod
65516 - 10.5 g - same
65517 - 11.8 g - ditto
65518 - 9.5 g
65519 - 10.6 g
65525 - 7.5 g
65526 - 3.5 g
65527 - 2.9 g
65528 - 3 g
65529 - 2.5 g
65535
65536
65537
65538
65539
65545 all small
65546
65547
65548
65549

65555 - 2.2 g soil clod
65556 - ditto
65557
65558
65559
65565
65566
65567
65568 all small
65569
65575
65576
65577
65578
65579
65585 - 9.3 g - agglutinate
65586 - 6.8 g - ditto
65587 - 2.1 g - ditto
65588 - 9.6 g - clod

Table 1. Chemical composition of 65501 and 65511.

					65500						ave. st. 5	65511	
reference	Korotev82		Baedecker72		Nava74		Philpotts73		Duncan73		Korotev81	Korotev82	
weight							< 570 um						
SiO2 %					46.2	(e)			44.86	(d)	45.3		
TiO2					0.62	(e)			0.7	(d)	0.65		
Al2O3	25.6	(a)			25.17	(e)			25.89	(d)	26.2	25.3	(a)
FeO	6.02	(a)			5.65	(e)			6.05	(d)	5.85	5.82	(a)
MnO	0.075	(a)			0.072	(e)			0.079	(d)	0.075	0.08	(a)
MgO	7	(a)			6.91	(e)			6.28	(d)	6.25	6.7	(a)
CaO	14.2	(a)			14.25	(e)			14.9	(d)	15	14.2	(a)
Na2O	0.473	(a)							0.44	(d)	0.45	0.474	(a)
K2O					0.139	(e)	0.138	(c)	0.148	(d)	0.134		
P2O5					0.137	(e)			0.157	(d)			
S %									0.082	(d)			
sum													
Sc ppm	10.2	(a)									10.1	10.6	(a)
V	20	(a)									25	24	(a)
Cr	830	(a)			821	(e)					780	847	(a)
Co	36.4	(a)									31	26.3	(a)
Ni	515	(a)	491	(b)					290		430	370	(a)
Cu									5.7				
Zn			26	(b)					23				
Ga			5.6	(b)									
Ge ppb			1250	(b)									
As													
Se													
Rb							3.56	(c)	3.84	(d)	3.3		
Sr	155	(a)					162	(c)	162	(d)	162	165	(a)
Y									48	(d)	48		
Zr	215	(a)							228	(d)	205	240	(a)
Nb									15	(d)			
Mo													
Ru													
Rh													
Pd ppb													
Ag ppb													
Cd ppb			100	(b)									
In ppb			16	(b)									
Sn ppb													
Sb ppb													
Te ppb													
Cs ppm	0.16	(a)										0.17	(a)
Ba	175	(a)					165	(c)	175	(d)	130	172	(a)
La	14.7	(a)									14.4	15.9	(a)
Ce	39.5	(a)					37.6	(c)				42.7	(a)
Pr													
Nd							24.2	(c)					
Sm	7.03	(a)					6.9	(c)			6.7	7.56	(a)
Eu	1.211	(a)					1.26	(c)			1.24	1.233	(a)
Gd							8.63	(c)					
Tb	1.49	(a)									1.44	1.59	(a)
Dy							9.12	(c)					
Ho													
Er							5.46	(c)					
Tm													
Yb	4.99	(a)					5.02	(c)			4.9	5.35	(a)
Lu	0.704	(a)					0.768	(c)			0.71	0.75	(a)
Hf	5.5	(a)									5.1	6.15	(a)
Ta	0.74	(a)									0.54	0.83	(a)
W ppb													
Re ppb													
Os ppb													
Ir ppb	14.1	(a)	14	(b)								10.5	(a)
Pt ppb													
Au ppb			8.1	(b)									
Th ppm	2.77	(a)									2.2	2.84	(a)
U ppm	0.7	(a)									0.67	0.74	(a)

technique: (a) INAA, (b) RNAA, (c) IDMS, (d) XRF, (e) AA

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