66081

Soil

301 grams

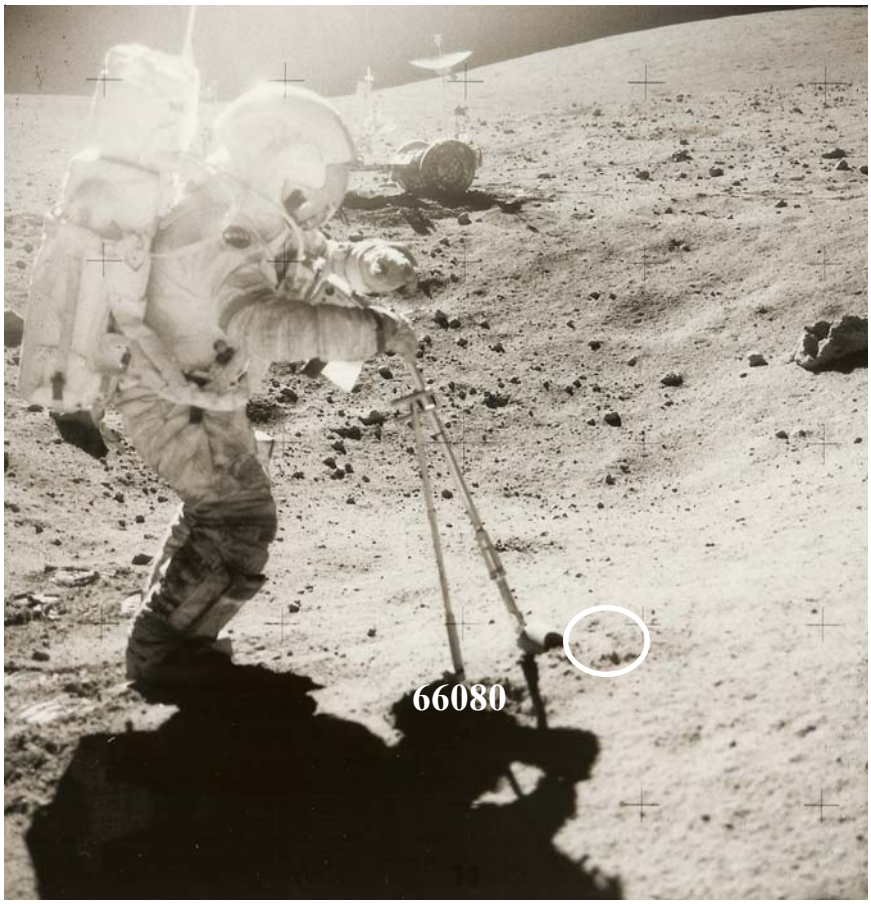
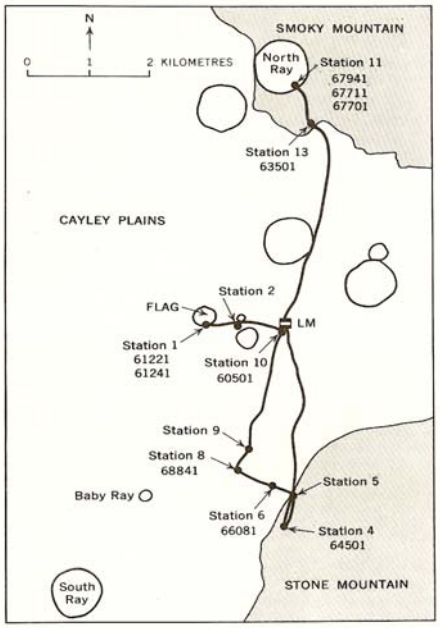
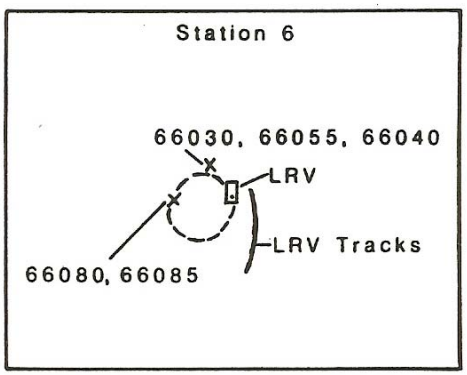


Figure 1: Photo of astronaut getting ready to collect soil sample 66081. AS16-108-17629.





Figures 2 and 3: Maps of Apollo 16 site and station 6.

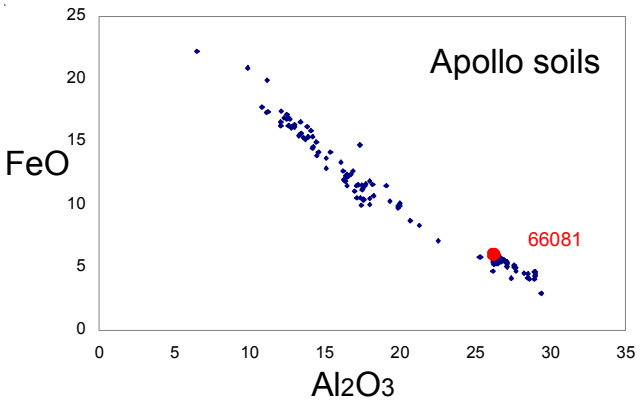


Figure 4: Composition of 66081 compared with that of all other Apollo soils samples.

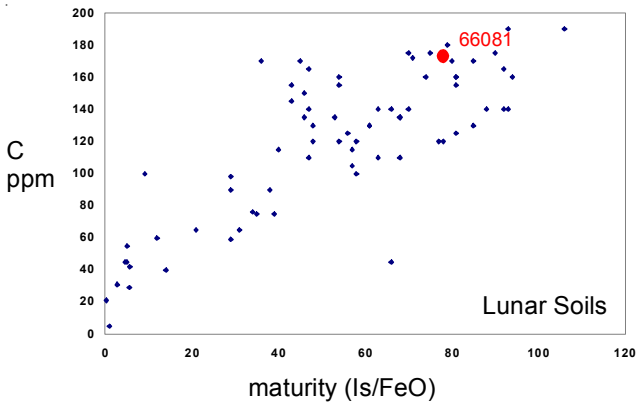


Figure 5: Carbon content and maturity index for 66081.

Introduction

66081 was collected from a small subdued crater on the Cayley Plain near Stone Mountain (figures 1-3). The location is across from the area where 66031, 41 were collected and they have about the same properties.

Petrography

The maturity index for 66081 is $I_s/FeO = 80$ and average grain size = 67 microns (figure 7).

Chemistry

Compston et al. (1973), Rose et al. (1973), Laul et al. (1973) and other have analyzed 66081 (table 1 and figures 4 and 6). Finkelman et al. (1975) analyzed the fine fraction. Korotev (1982) showed all the analyses from station 6 were similar.

The meteoritic siderophile content is high, but the very high Ni reported is probably form the sieves.

Moore et al. (1973) determined 170 ppm carbon for 66081 (figure 5). Kerridge et al. (1975) determined 169 ppm carbon and 110 ppm nitrogen. This is a very mature soil sample.

Cosmogenic isotopes and exposure ages

Clark and Keith (1973) determined the cosmic-ray-induced activity of ^{26}Al = 102 dpm/kg and ^{22}Na = 44 dpm/kg. Walton et al. (1973) determined a Ne exposure age of 230 m.y.

Mineralogical Mode

From Butler	74-53 microns
Olivine	1.4 %
Pyroxene	1.4
Plagioclase	9.7
Glass	4.3
Rock fragments	28
Welded fragments	55

Other Studies

Walton et al. (1973) determined the rare gas content and isotopic ratios for 66081.

Nunes (19750 studied the Pb isotopes.

Table 1. Chemical composition of 66081.

reference	LSPET72		Compston73		Clark73		Baedecker72			Rose73		Laul73	Laul73b		Finkelman75			Boynton75		ave. st. 6 Korotev81
weight															c	<30 um				
SiO2 %	45.38	(a)	44.56	(a)						45	(d)									45.2
TiO2	0.67	(a)	0.67	(a)						0.66	(d)	0.75	0.7	(e)						0.67
Al2O3	26.22	(a)	25.8	(a)						26	(d)	26.8	26.6	(e)						26.4
FeO	5.85	(a)	5.97	(a)						6.15	(d)	6.5	6.5	(e)				6.17	(e)	5.95
MnO	0.08	(a)	0.08	(a)						0.08	(d)	0.073	0.073	(e)				0.081	(e)	0.077
MgO	6.39	(a)	6.44	(a)						6.36	(d)	6	6	(e)						6.25
CaO	15.28	(a)	15.26	(a)						15	(d)	17	15.3	(e)				16	(e)	15.7
Na2O	0.39	(a)	0.45	(a)						0.59	(d)	0.446	0.446	(e)				0.5	(e)	0.44
K2O	0.13	(a)	0.13	(a)	0.13	(b)				0.15	(d)	0.11	0.11	(e)						0.12
P2O5	0.13	(a)	0.11	(a)						0.15	(d)									
S %	0.09	(a)	0.06	(a)																
sum																				
Sc ppm										10	(d)	11	11	(e)	9	14	(f)	10.8	(e)	10.4
V										19	(d)	25	25	(e)	16	38	(f)			24
Cr	830	(a)								890	(d)	842	842	(e)				790	(e)	795
Co										22	(d)	42	36	(e)	22	38	(f)	38	(e)	33.5
Ni	342	(a)					705	623	(c)	335	(d)				330	920	(f)			460
Cu										9.5	(d)				7	15	(f)			
Zn							23	22	(c)	21	(d)				12	27	(f)			
Ga							5.4	5.1	(c)						3	4	(f)			
Ge ppb							1650	1160	(c)											
As																				
Se																				
Rb	3.1	(a)	3.01	(g)											3	2	(f)			3
Sr	170	(a)	165	(g)						145	(d)				150	150	(f)			163
Y	48	(a)								39	(d)				40	71	(f)			44
Zr	205	(a)								125	(d)				110	220	(f)			182
Nb	13	(a)														17	(f)			
Mo																				
Ru																				
Rh																				
Pd ppb																				
Ag ppb																				
Cd ppb							78	78	(c)											
In ppb							15	15	(c)											
Sn ppb																				
Sb ppb																				
Te ppb																				
Cs ppm																				
Ba										130	(d)		130		120	140	(f)	150	(e)	142
La												14.7	14.7	(e)				14	(e)	13.7
Ce												37	37	(e)				39	(e)	
Pr																				
Nd													25	(e)						
Sm												7.1	7.1	(e)				7.7	(e)	6.95
Eu												1.23	1.23	(e)				1.35	(e)	1.27
Gd																				
Tb												1.3	1.3	(e)				1.3	(e)	1.32
Dy												8.4	8.4	(e)				10.1	(e)	
Ho																				
Er																				
Tm																				
Yb												5	5	(e)				4.9	(e)	4.65
Lu												0.77	0.77	(e)				0.83	(e)	0.73
Hf												4.5	4.5	(e)				5.3	(e)	4.7
Ta												0.64	0.64	(e)				0.58	(e)	0.6
W ppb																				
Re ppb																				
Os ppb																				
Ir ppb							24	19	(c)											
Pt ppb																				
Au ppb							11.9	9.3	(c)											
Th ppm	3.2	(a)			2.3	(b)						2.1	2.1	(e)				2.7	(e)	2.4
U ppm					0.7	(b)						0.6	0.6	(e)						0.67

technique: (a) XRF, (b) radiation count., (c) RNAA, (d) 'microchem.', (e) INAA, (f) OES, (g) IDMS

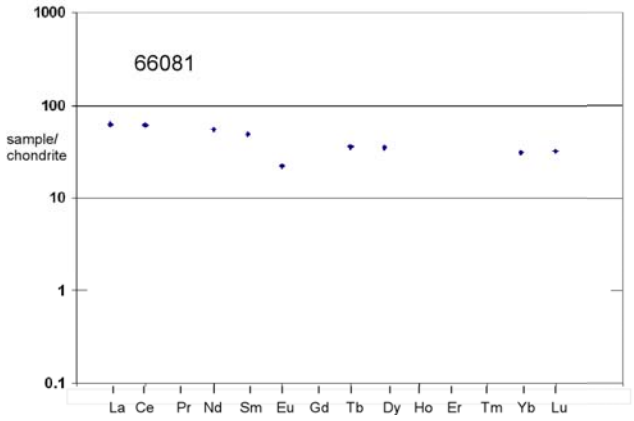
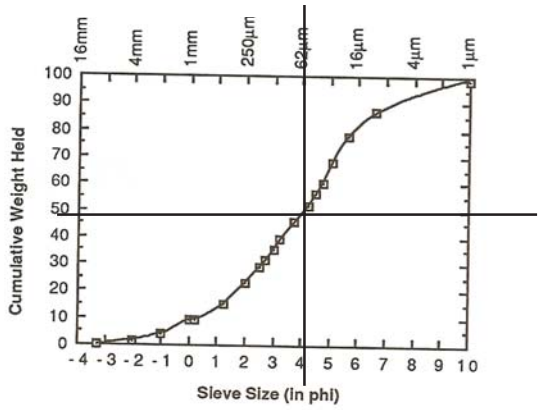


Figure 6: Normalized rare-earth-element diagram for 66081.



average grain size = 67 microns

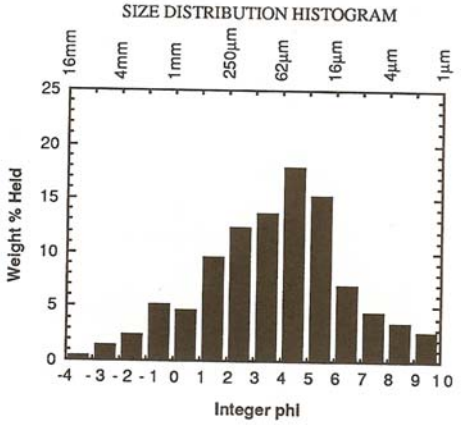
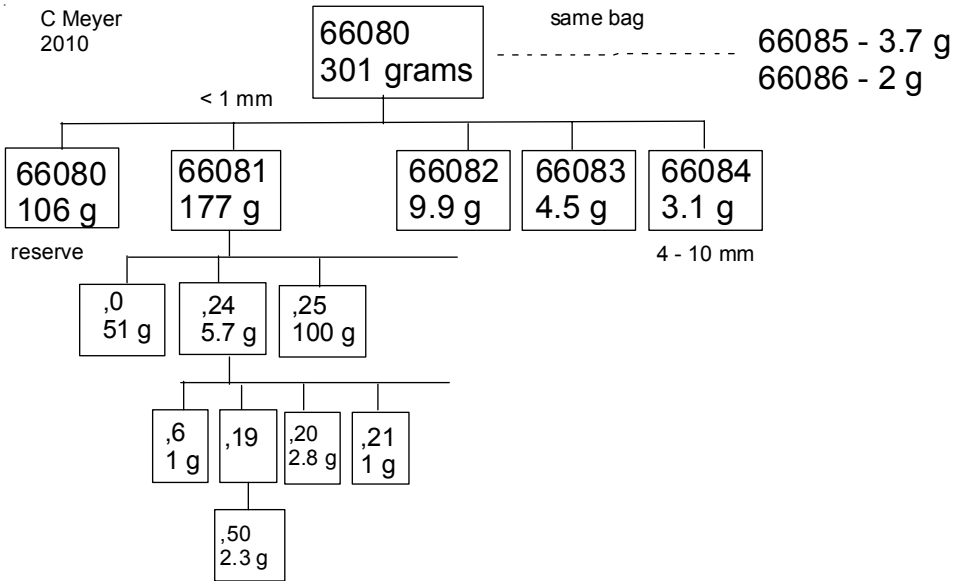


Figure 7: Grain size distributuion for 66080 (Graf 1993, fom data by Butler et al.)



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