

72701 and 72730

Soil

885.4 and 2 grams

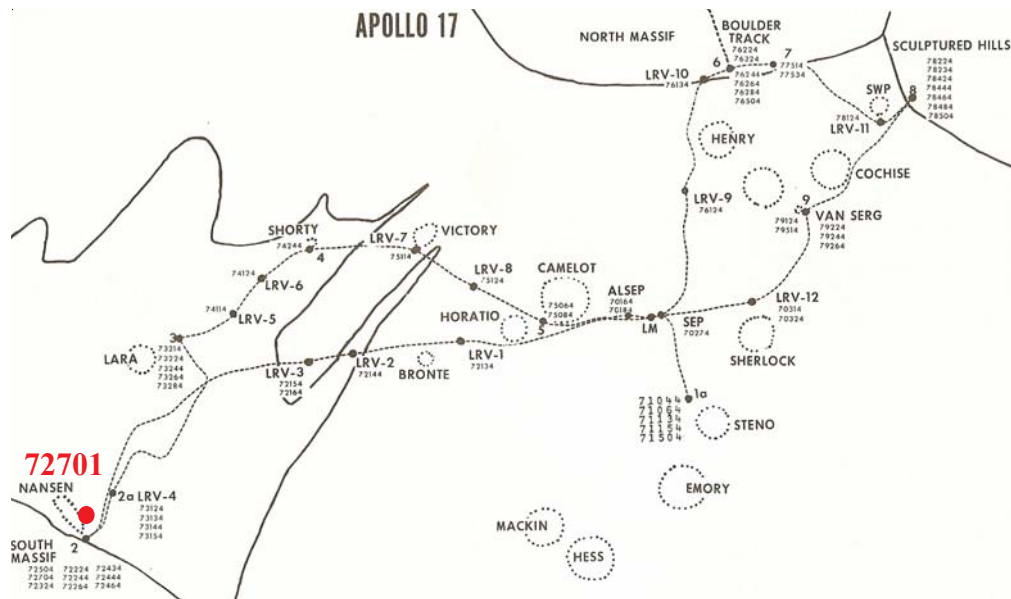


Figure 1: Map of Apollo 17 site drawn by C Meyer (1973) with 72701 on the rim of Nansen Crater.

Introduction

72700 and 72730 were collected from station 2 on the rim of Nansen Crater at the bottom slope of the South Massif, Apollo 17 (figure 1). A map of station 2 is found in the section on 72501 (figure 6). The rake sample (72730) yielded only 4 rocks and very little soil. The sieving of the adjacent soil sample (72700) only recovered one rock over 1 cm and very few coarse-

fines. Note that in figure 2, there are no rocks on the surface.

Petrography

The maturity index of 72701 is $I_s/FeO = 61$ and the average grain size is 56 microns (Morris 1978, Graf 1993). Heiken and McKay (1974) found 44 % agglutinate.

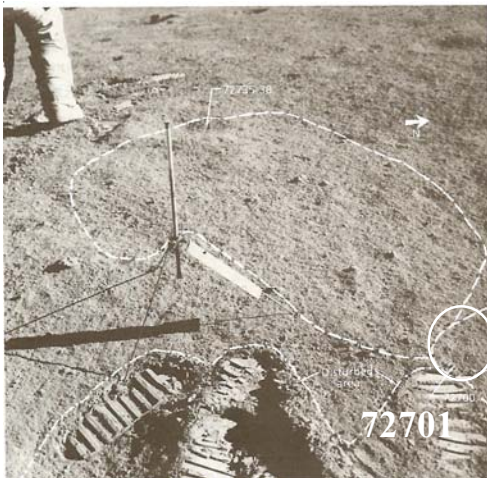


Figure 2: Location of 72701 and adjacent rake sample. AS17-137-20974.

Modal content of soil 72701 (90-150 micron).

From Heiken and McKay 1974.

	72701
Agglutinates	43.6
Basalt	1.7
Breccia	34
Anorthosite	2.3
Norite	0.3
Gabbro	
Plagioclase	7.7
Pyroxene	3.7
Olivine	1.7
Ilmenite	
Orange glass	1
Glass other	3.7

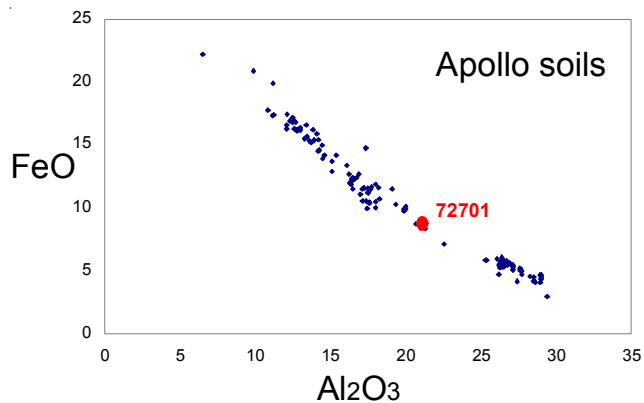


Figure 3: Composition of 72701 compared with other Apollo soil samples.

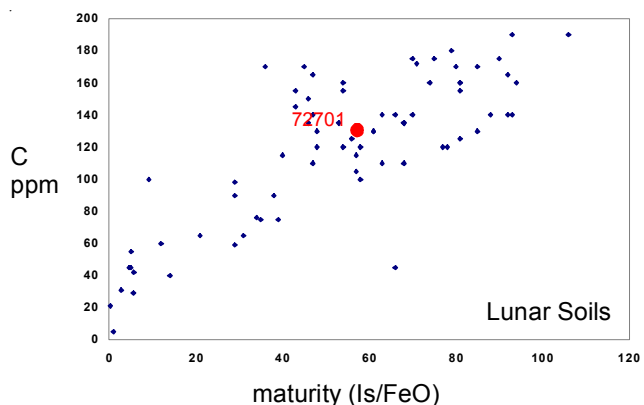
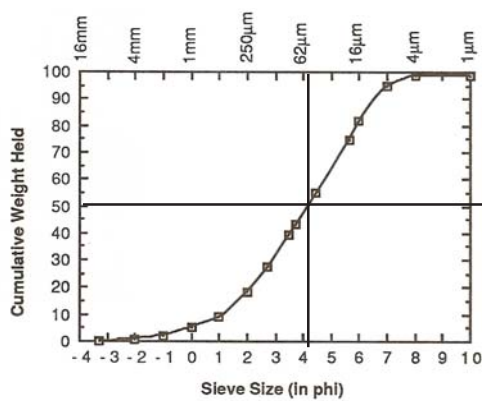


Figure 4: Carbon content and maturity index for 72701 compared with other Apollo soils.



average grain size = 56 microns

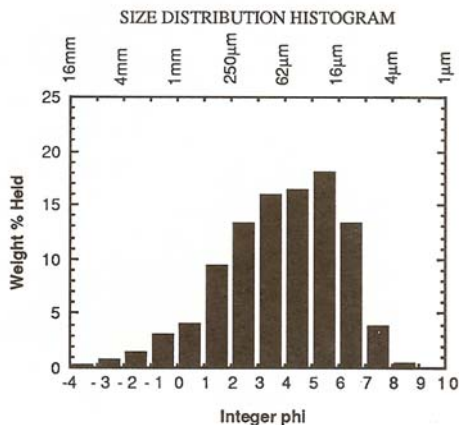


Figure 5: Grain size distribution for 72700 (Graf 1993, data from McKay).

Meyer (1973) cataloged the 4 – 10 mm coarse-fines and Blanchard et al. (1975) studied the 1 – 2 mm fraction. Blanchard et al. reported 10 “highland rocks” and 7 “glassy breccias” but gave no details. Bence et al. (1974) studied the mineralogy of recrystallized norite and KREEP-rich melt rocks (figures 7 and 8) found in the 2 – 4 mm coarse fines.

Chemistry

The chemical composition of 72701 is similar to other samples of the “landslide” or “light mantle” off of the South Massif. It is aluminous and enriched in trace elements (figures 3 and 6). It also has a high content of meteoritic siderophile elements (Ni, Ir and Au).

Blanchard et al. (1975) analyzed the fines and gave an average for 20 coarse-fine particles.

Moore et al. (1974) determined 140 ppm carbon (figure 4). Muller (1974) determined 73 ppm nitrogen. Petrowski et al. (1974) determined 149 ppm carbon,

91 ppm nitrogen and 54 ppm hydrogen. Jovanovic and Reed (1974) determined the halogens.

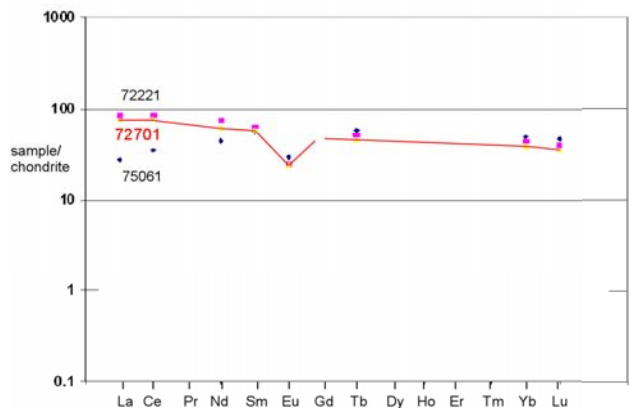


Figure 6: Normalized rare-earth-element diagram for 72701 compared with 72221 and 75061.

Other Studies

Bogard et al. (1974), Hintenberger et al. (1974), and Hubner et al. (1974) reported the rare gas content and isotopic ratios. Nunes et al. (1974) reported U, Th and Pb isotopes.

Curtis and Wasserburg (1977) determined the isotopic ratio for Gd to determine the total flux of neutrons.

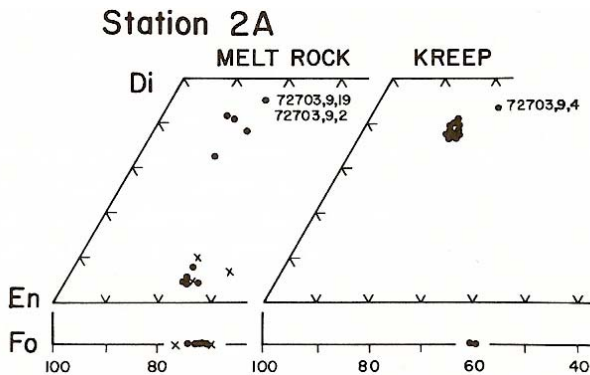


Figure 7: Olivine and pyroxene composition of coarse-fine particles from 72703 (Bence et al. 1974).



Figure 8: Photomicrographs of 72703,9 (KREEP) and 72703,8 (melt rock) (Bence et al. 1974).

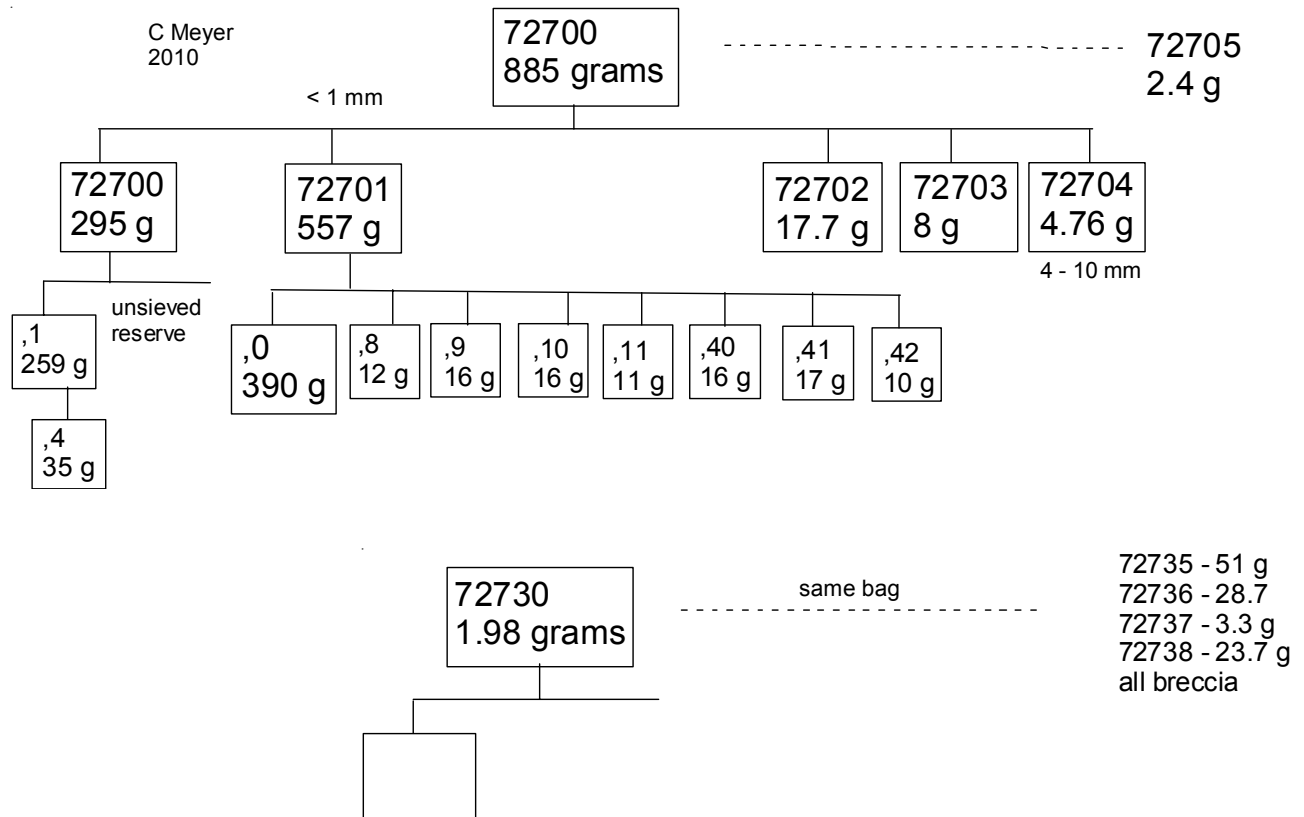


Table 1. Chemical composition of 72701.

	Wiesmann76											
reference	LSPET73		Korotev92			Duncan74	Baedecker74	Wanke73	Scoon74	Blanchard75		
weight	Rhodes74								1 - 2 mm			
												ave. 20
SiO2 %	44.87	44.96	(a)			45.24	(a)	45.8	(b)	45.45	(e)	
TiO2	1.52	1.53	(a)			1.5	(a)	1.55	(b)	1.59	(e)	
Al2O3	20.6	20.55	(a)			20.7	(a)	21	(b)	20.7	(e)	
FeO	8.65	8.94	(a)	8.85	9.04	(b) 8.78	(a) 8.88	(b) 8.64	(b)	8.99	(e)	9.07 8.36 (b)
MnO	0.12	0.13	(a)			0.116	(a) 0.14	(b) 0.11	(b)	0.12	(e)	0.13 0.12 (b)
MgO	9.97	9.98	(a)			9.99	(a)	10	(b)	9.86	(e)	
CaO	12.8	12.83	(a)			12.74	(a)	12.3	(b)	12.69	(e)	
Na2O	0.4	0.51	(a)	0.456	0.452	(b) 0.44	(a) 0.52	(b) 0.43	(b)	0.49	(e)	0.47 0.57 (b)
K2O	0.16	0.16	(c)			0.154	(a)	0.132	(b)	0.17	(e)	
P2O5	0.15	0.14	(a)			0.153	(a)			0.14	(e)	
S %	0.07	0.07	(a)			0.074	(a)			0.05	(e)	
sum												
Sc ppm				19.1	18.7	(b)		19	(b)	17.3	(b)	19.4 16.6 (b)
V							47	(a)				
Cr	1574	1410	(c)	1570	1577	(b) 1567	(a) 1430	(b) 1370	(b)			1625 1550 (b)
Co				34.2	39	(b) 30	(a) 32	(b) 28.3	(b)			27.1 22.8 (b)
Ni	227	230	(a)	341	350	(b) 231	(a) 317	(d) 210	(b)			240 250 (b)
Cu							4.5	(a)				
Zn	22	20	(a)			17.5	(a)	18.4	(d)			
Ga								4.45	(d)			
Ge ppb								514	(d)			
As												
Se												
Rb	3.9	3.94	(c)			4.3	(a)					
Sr	155	153	(a)	158	181	(b) 150	(a)	170	(b)			
Y	54	60	(a)			54.7	(a)	56	(b)			
Zr	275	239	(c)	250	280	(b) 264	(a) 243	(b) 256	(b)			
Nb	18	18	(a)			16.9	(a)	18	(b)			
Mo												
Ru												
Rh												
Pd ppb												
Ag ppb												
Cd ppb								36	(d)			
In ppb								1.4	(d)			
Sn ppb												
Sb ppb												
Te ppb												
Cs ppm												
Ba		192	(c)	194	193	(b) 190	(a)	150	(b)			
La		17	(c)	17.8	17.1	(b)		16.9	(b)			16.7 20.2 (b)
Ce		43.6	(c)	46.8	44	(b)		41	(b)	47	(b)	43.4 53.9 (b)
Pr												
Nd				28	27	(b)		28	(b)			
Sm		8.07	(c)	8.51	8.26	(b)		7.92	(b)			8.22 8.65 (b)
Eu		1.31	(c)	1.34	1.32	(b)	1.3	(b) 1.36	(b)			1.31 1.4 (b)
Gd		10.1	(c)									
Tb				165	169	(b)	1.7	(b) 1.7	(b)			1.8 1.84 (b)
Dy		10.9	(c)					10.4	(b)			
Ho								2.3	(b)			
Er		6.46	(c)									
Tm												
Yb		5.99	(c)	6.16	6.08	(b)	4.4	(b) 5.9	(b)			6.44 6.55 (b)
Lu				0.853	0.849	(b)		0.91	(b)			0.95 0.96 (b)
Hf				6.65	6.36	(b)	7.1	(b) 5.8	(b)			6.7 6.4 (b)
Ta				0.85	0.79	(b)	0.72	(b) 0.7	(b)			0.9 0.8 (b)
W ppb												
Re ppb												
Os ppb												
Ir ppb				13	14.5	(b)	10.6	(d) 10	(d)			
Pt ppb												
Au ppb				5	5.3	(b)	4	(d) 7	(d)			
Th ppm				3.2	2.94	(b)	3.4	(b) 2.4	(b)			
U ppm		0.81	(c)	0.76	0.73	(b)						

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

References for 72701

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