65701 – 271 grams
65710 – 91 grams
Soil and rake residue

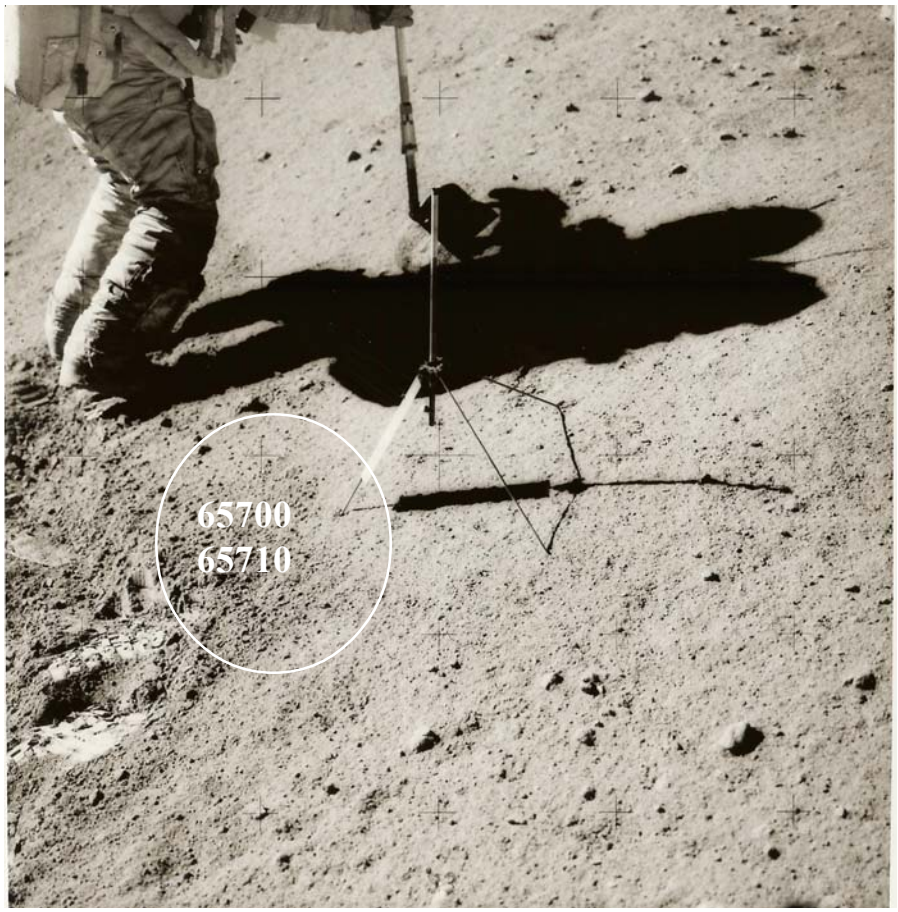
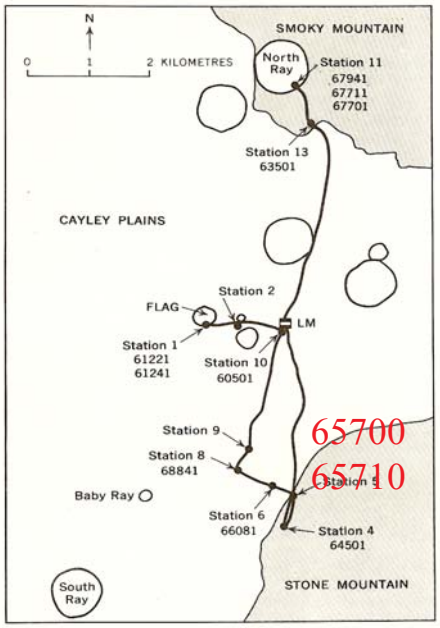
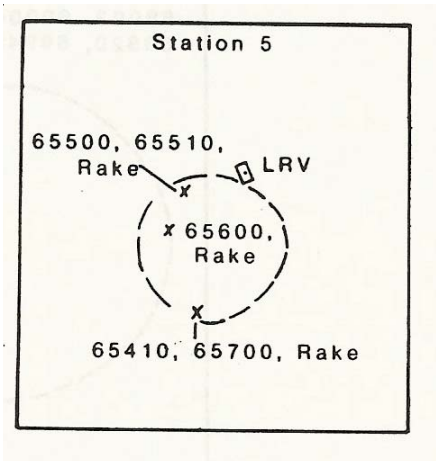


Figure 1: Close-up photo of area where 65700 and 65710 were collected. AS16-110-18022.





Figures 2 and 3: Maps of location of station 5 at Apollo 16.

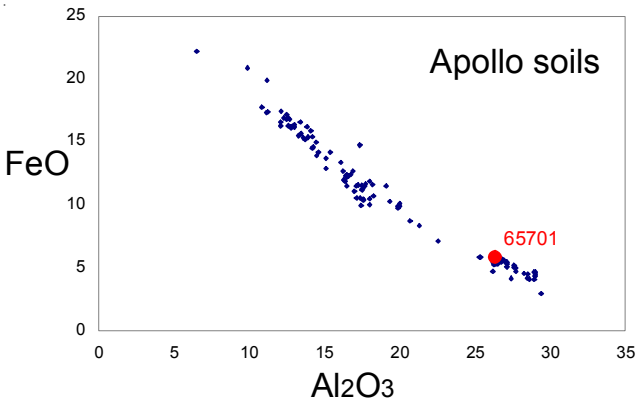


Figure 4: Composition of 65701 compared with that of all Apollo soils.

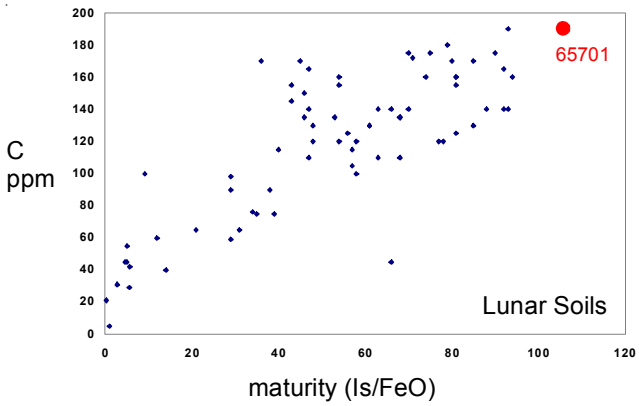


Figure 5: Carbon content and maturity index for 65701 compared with other soils.

Introduction

Station 5 was at the base of Stone Mountain on the Cayley Plain (figure 2). Soil samples 65501, 65601 and 65701 were all taken from a small crater (figure 3).

Petrography

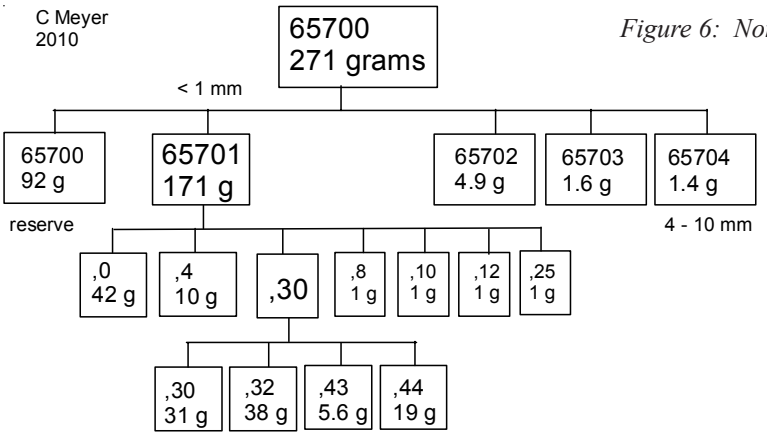
The maturity index for 65701 is very high I_s/FeO = 106 (highest ever) and the average grain size is small (58 microns). The mineral mode and agglutinate content of 65701 have not been reported.

Chemistry

The bulk composition of 65701 is typical of Apollo 16 soil (table 1 and figures 4 and 6). The meteoritic siderophile content is high.

Moore et al. (1973) determined 190 ppm carbon for 65701 (figure 5). Moore et al. also studied the carbon content of various size fractions of 65701. Kerridge et al. (1975) reported 118 ppm nitrogen.

Cirlin and Housley (1981) determined 75 ppb Cd and 22 ppm Zn.



Cosmogenic isotopes and exposure ages

Wrigley (1973) determined the cosmic-ray-induced activity of ^{26}Al = 131 dpm/kg and ^{22}Na = 56 dpm/kg . Walton et al. (1973) determined a Ne exposure age of 200 m.y.

Other Studies

Walton et al. (1973) and Hintenberger and Weber (1973) determined the rare gas content and isotopic ratios for 65701.

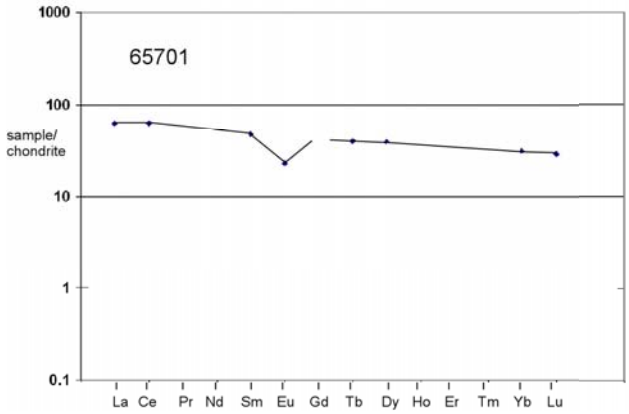
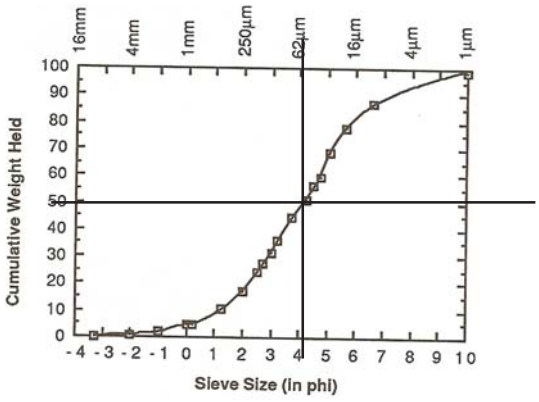


Figure 6: Normalized rare-earth-element diagram



average grain size = 58 microns

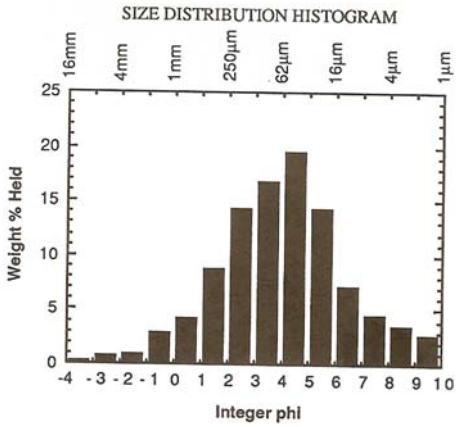


Figure 7: Grain size distribution of 65701 (Graf 1993, from data by Butler et al.).

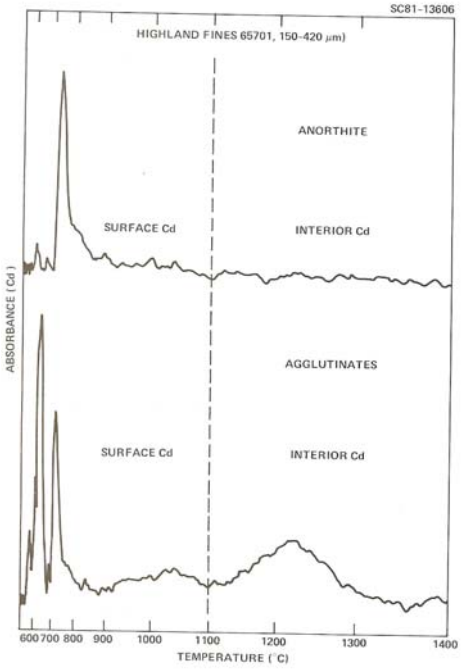
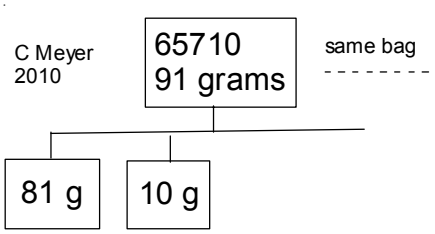


Figure 8: Cd as a surface feature on grains from 65701 (Cirlin and Housley 1981).



65715 - 31.4 g - bx.
65716 - 14.3 g
65717 - 7.4 g
65718
65719
65725
65726
65727
65728
65729
65735
65736
65737
65738
65739
65745
65746
65747
65748
65749

65755
65756
65757 - 26.2 g
65758
65759
65765
65766
65767
65768
65769
65775
65776
65777 - 16.6 g - xtln.
65778 - 12.2 g - xtln.
65779 - 12.7 g - xtln.
65785 - 5.2 g - xtln.
65786 - 83 g - bx.
65787
65788
65789 - 12.2 g - anor.
65795 - 6.8 g - anor.

Table 1. Chemical composition of 65701.

reference	LSPET72		Compston73		Taylor73		Wrigley73		Wanke73		Haskin73		Boynton76		ave. st. 5 Korotev81
weight															
SiO2 %	45.03	(a)	44.95	(a)	44.7	(b)			45.1	(c)	45.4				45.3
TiO2	0.64	(a)	0.65	(a)	0.65	(b)					0.7				0.65
Al2O3	26.47	(a)	26.22	(a)	26.3	(b)			26.6	(c)	28.2				26.2
FeO	5.87	(a)	5.85	(a)	5.68	(b)			5.84	(c)	5.53				5.85
MnO	0.08	(a)	0.08	(a)					0.07	(c)	0.074				0.075
MgO	6.02	(a)	6.34	(a)	6.19	(b)			6.1	(c)	6.02				6.25
CaO	15.29	(a)	15.39	(a)	15	(b)			15.1	(c)	12.8				15
Na2O	0.41	(a)	0.45	(a)	0.43	(b)			0.44	(c)	0.48				0.45
K2O	0.12	(a)	0.12	(a)	0.25	(b)	0.12	(d)	0.12	(c)	0.138				0.134
P2O5	0.13	(a)	0.11	(a)											
S %	0.09	(a)	0.06	(a)											
sum															
Sc ppm					11	(b)			9	(c)	10.11	(c)			10.1
V					30	(b)									25
Cr	820	(a)			850	(b)			770	(c)					780
Co					30	(b)			30	(c)	31.7				31
Ni	356	(a)			370	(b)			420	(c)	510		498	(e)	430
Cu					8	(b)					91				
Zn													17.7	(e)	
Ga											15.4	(c)	5.4	(e)	
Ge ppb													1000	(e)	
As															
Se															
Rb	2.9	(a)	3.14	(f)	2.15	(b)					3.2	(c)			3.3
Sr	173	(a)	168	(f)					152	(c)					162
Y	48	(a)			45	(b)									48
Zr	207	(a)			207	(b)									205
Nb	13	(a)			13.9	(b)									
Mo															
Ru													34	(e)	
Rh															
Pd ppb															
Ag ppb															
Cd ppb													77	(e)	
In ppb													23.3	(e)	
Sn ppb															
Sb ppb															
Te ppb															
Cs ppm					0.09	(b)									
Ba					180	(b)			100	(c)					130
La					13.6	(b)			13	(c)	14.7	(c)			14.4
Ce					36.6	(b)			38	(c)	38.3	(c)			
Pr					4.7	(b)									
Nd					20	(b)			19	(c)	25.4	(c)			
Sm					5.61	(b)			5.9	(c)	7.01	(c)			6.7
Eu					1.09	(b)			1.17	(c)	1.27	(c)			1.24
Gd					7.55	(b)					8.8	(c)			
Tb					1.1	(b)			1.2	(c)	1.46	(c)			1.44
Dy					7.3	(b)			7.5	(c)	9.6	(c)			
Ho					1.81	(b)			1.9	(c)					
Er					5	(b)									
Tm					0.76	(b)									
Yb					4.62	(b)			4.45	(c)	5.05	(c)			4.9
Lu					0.72	(b)			0.58	(c)	0.71	(c)			0.71
Hf									4.8	(c)	5.4	(c)			5.1
Ta									0.54	(c)					0.54
W ppb															
Re ppb															
Os ppb															
Ir ppb									19	(c)			9.2	(e)	
Pt ppb															
Au ppb									13.5	(c)			9.4	(e)	
Th ppm	1.9	(a)			2.4	(b)	2.31	(d)							2.2
U ppm					0.63	(b)	0.57	(d)							0.67

technique: (a) XRF, (b) SSMS, (c) INAA, (d) radiation count. (e) RNAA, (f) IDMS

References for 65701.

Butler P. (1972) Lunar Sample Information Catalog Apollo 16. Lunar Receiving Laboratory. MSC 03210 Curator's Catalog. pp. 370.

Butler J.C., Greene G.M. and King E.A. (1973) Grain size frequency distribution and modal analysis of Apollo 16 fines. *Proc. 4th Lunar Sci. Conf.* 267-278.

Cirlin E.H. and Housley R.M. (1981) Distribution and evolution of Zn, Cd, and Pb in Apollo 16 regolith samples and the average U-Pb ages of the parent rocks. *Proc. 12th Lunar Planet. Sci. Conf.* 529-540.

Compston W., Vernon M.J., Chappell B.W. and Freeman R. (1973) Rb-Sr model ages and chemical composition of nine Apollo 16 soils (abs). *Lunar Sci.* **IV**, 158.

Graf J.C. (1993) Lunar Soils Grain Size Catalog. NASA Pub. 1265

Haskin L.A., Helmke P.A., Blanchard D.P., Jacobs J.W. and Telunder K. (1973) Major and trace element abundances in samples from the lunar highlands. *Proc. 4th Lunar Sci. Conf.* 1275-1296.

Hintenberger H. and Weber H.W. (1973) Trapped rare gases in lunar fines and breccias. P*roc. 4th Lunar Sci. Conf.* 2003-2019.

Heiken G.H., McKay D.S. and Fruland R.M. (1973b) Apollo 16 soils – grain size analysis and petrography. *Proc. 4th Lunar Sci. Conf.* 251-266.

Housley R.M., Cirlin E.H. and Grant R.W. (1973) Characterization of fines from the Apollo 16 site. *Proc. 4th Lunar Sci. Conf.* 2729-2735.

Keil K., Dowty E., Prinz M. and Bunch T.E. (1972) Description, classification and inventory of 151 Apollo 16 rake samples from the LM area and station 5. Curator's Catalog, JSC.

LSPET (1973) The Apollo 16 lunar samples: Petrographic and chemical description. *Science* 179, 23-34.

LSPET (1972) Preliminary examination of lunar samples. Apollo 16 Preliminary Science Report. NASA SP-315, 7-1—7-58.

Marvin U.B. (1972) Apollo 16 coarse fines (4-10 mm): Sample classification, description and inventory. JSC Catalog.

Moore C.B., Lewis C.F. and Gibson E.K. (1973) Total carbon contents of Apollo 15 and 16 lunar samples. *Proc. 4th Lunar Sci. Conf.* 1613-1923.

Moore C.B. and Lewis C.F. (1975) Total nitrogen contents of Apollo 15, 16 and 17 lunar fines samples. *Lunar Sci.* **VI**, 569-571.

Morris R.V., Score R., Dardano C. and Heiken G. (1983) Handbook of Lunar Soils. Two Parts. JSC 19069. Curator's Office, Houston

Morris R.V. (1978) The surface exposure (maturity) of lunar soils: Some concepts and Is/FeO compilation. *Proc. 9th Lunar Sci. Conf.* 2287-2297.

Papike J.J., Simon S.B. and Laul J.C. (1982) The lunar regolith. *Rev. Geophys. Space Phys.* 20, 761-826.

Sutton R.L. (1981) Documentation of Apollo 16 samples. In Geology of the Apollo 16 area, central lunar highlands. (Ulrich et al.) U.S.G.S. Prof. Paper 1048.

Taylor S.R., Gorton M.P., Muir P., Nance W.B., Rudowski R. and Ware N. (1973a) Composition of the Descartes region, lunar highlands. *Geochim. Cosmochim Acta* **37**, 2665-2683.

Walton J.R., Lakatos S. and Heymann D. (1973) Distribution of inert gases in fines from the Cayley-Descartes region. *Proc. 4th Lunar Sci. Conf.* 2079-2096.

Wänke H., Baddenhausen H., Dreibus G., Jagoutz E., Kruse H., Palme H., Spettel B. and Teschke F. (1973) Multielement analysis of Apollo 15, 16 and 17 samples and the bulk composition of the moon. *Proc. 4th Lunar Sci. Conf.* 1461-1481.

Warner R.D., Dowty E., Prinz M., Conrad G.H., Nehru C.E. and Keil K. (1976c) Catalog of Apollo 16 rake samples from the LM area and station 5. Spec. Publ. #13, UNM Institute of Meteoritics, Albuquerque. 87 pp.

Wlotzka F., Spettel B. and Wanke H. (1973) On the composition of metal from Apollo 16 fines and the meteoritic component. *Proc. 4th Lunar Sci. Conf.* 1483-1491.

Wrigley R.C. (1973) Radionuclides at Descartes in the central highlands. *Proc. 4th Lunar Sci. Conf.* 2203-2208.