65901 and 65920

Soil and rake residue

662 and 12 grams

Figure 1: Close-up photo of area where 65900 and 65910 were collected. AS16-107-17509.

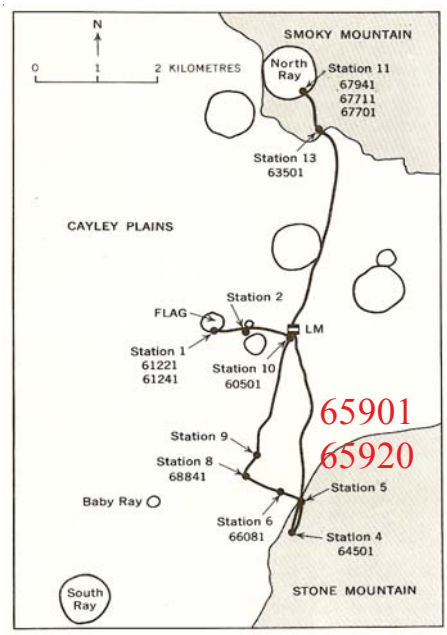


Figure 2: Map of Apollo 16 site with station 5 indicated.

Mineralogical Mode

From Butler et al. 1973

Olivine	0.7 %
Pyroxene	1.8
Plagioclase	10.9
Glass	19.7
Rock Fragments	33.5
Welded Fragments	44.4

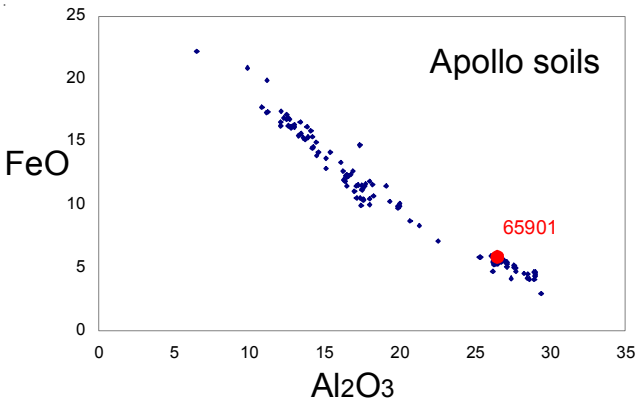


Figure 3: Composition of 65901 compared with all Appollo soils.

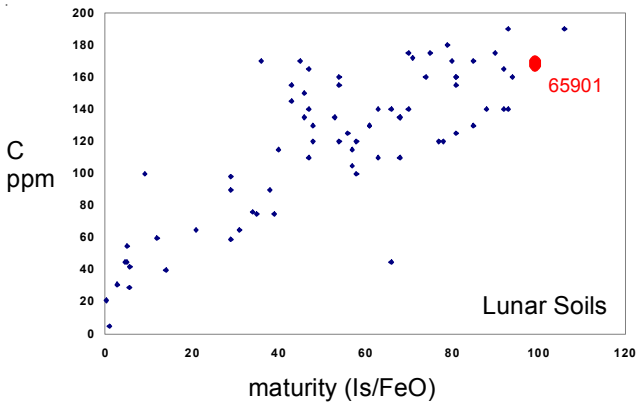


Figure 4: Carbon content and maturity index for 65901.

Introduction

Station 5 was at a small carter on the base of Stone Mountain (figures 1 and 2). 65900 is a sub-surface sample from 5 – 15 cm deep on the inside wall of the small crater. 65920 is the residue from a rake sample at the same location.

Petrography

65901 is a very mature soil (I_s/FeO = 99). It has an average grain size of 85 microns (figure 6). Butler et al. (1973) reported a high percentage of glass.

Chemistry

The composition of 65901 was reported by Laul and Schmitt (1973) and is similar to the other soils from station 5 (and for most of the Cayley Plain, for that matter).

Moore et al. (1973) determined 170 ppm carbon for 65901 (figure 4). Kerridge et al. (1975) and Moore and Lewis (1975) reported 116 ppm and 115 ppm nitrogen for 65901.

Cosmogenic isotopes and exposure ages

Eldridge et al. (1973) determined the cosmic-ray-induced activity of ^{26}Al = 109 dpm/kg and ^{22}Na = 32 dpm/kg. Clark and Keith (1973) determined the cosmic-ray-induced activity of ^{26}Al = 124 dpm/kg, ^{22}Na = 42 dpm/kg, ^{54}Mn = 30 dpm/kg, ^{56}Co = 9 and ^{46}Sc = <7 dpm/kg. Walton et al. (1973) determined a Ne exposure age of 210 m.y.

Other Studies

Walton et al. (1973) determined the rare gas content and isotopic ratios for 65901.

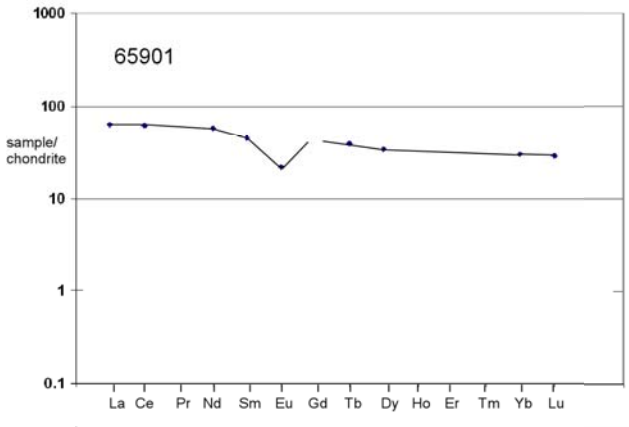
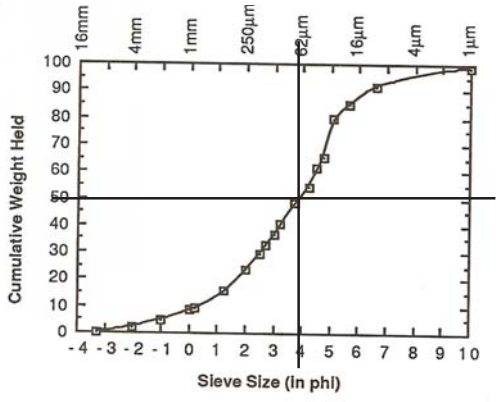


Figure 5: Normalized rare-earth-element diagram for 65901.



average grain size = 85 microns

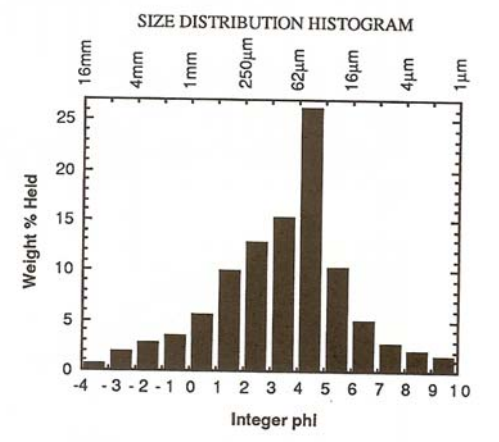
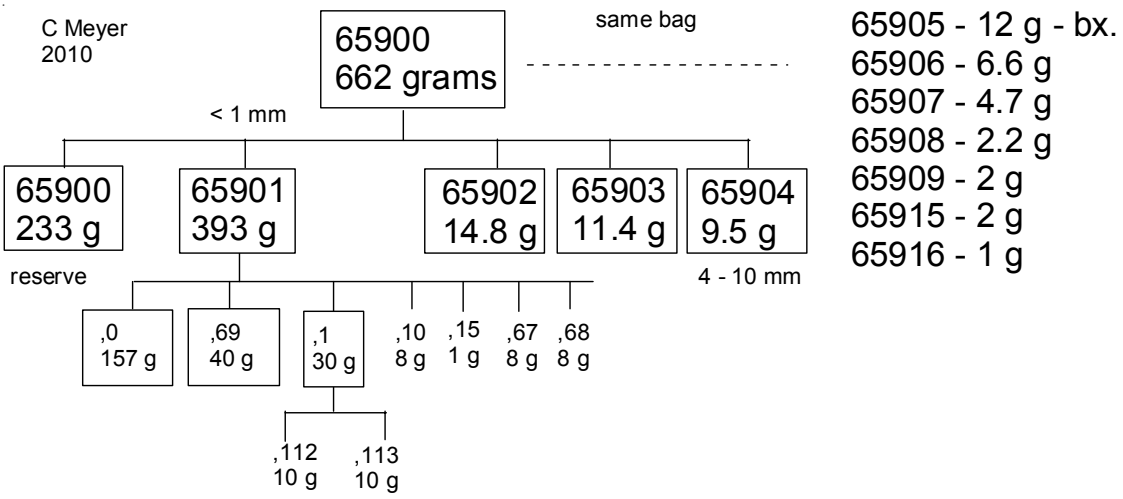


Figure 6: Grain size distribution of 65900 (Graf 1993, from data by Butler et al.)



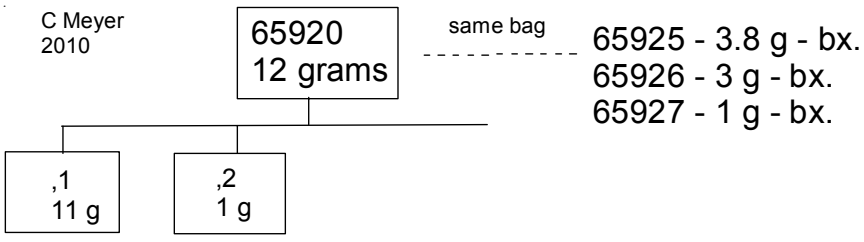


Table 1. Chemical composition of 65901.

reference	Clark73		Eldridge73		Laul73		ave. st. 5 Korotev81
weight							
SiO2 %							45.3
TiO2					0.61	(b)	0.65
Al2O3					26.5	(b)	26.2
FeO					5.8	(b)	5.85
MnO					0.07	(b)	0.075
MgO					6.2	(b)	6.25
CaO					15	(b)	15
Na2O					0.47	(b)	0.45
K2O	0.13	(a)	0.12	(a)	0.11	(b)	0.134
P2O5							
S %							
sum							
Sc ppm					11	(b)	10.1
V					25	(b)	25
Cr					753	(b)	780
Co					30	(b)	31
Ni					500	(b)	430
Cu							
Zn							
Ga							
Ge ppb							
As							
Se							
Rb							3.3
Sr							162
Y							48
Zr					160	(b)	205
Nb							
Mo							
Ru							
Rh							
Pd ppb							
Ag ppb							
Cd ppb							
In ppb							
Sn ppb							
Sb ppb							
Te ppb							
Cs ppm							
Ba					140	(b)	130
La					15.1	(b)	14.4
Ce					37	(b)	
Pr							
Nd					26	(b)	
Sm					6.7	(b)	6.7
Eu					1.22	(b)	1.24
Gd							
Tb					1.4	(b)	1.44
Dy					8.2	(b)	
Ho							
Er							
Tm							
Yb					4.9	(b)	4.9
Lu					0.7	(b)	0.71
Hf					4.7	(b)	5.1
Ta					0.61	(b)	0.54
W ppb							
Re ppb							
Os ppb							
Ir ppb					15	(b)	
Pt ppb							
Au ppb					9	(b)	
Th ppm	2.7	(a)	2.21	(a)	2.5	(b)	2.2
U ppm	0.62	(a)	0.6	(a)	0.8	(b)	0.67

technique: (a) radiation count. (b) INAA

References for 65901.

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.

Clark R.S. and Keith J.E. (1973) Determination of natural and cosmic ray induced radionuclides in Apollo 16 lunar samples. *Proc. 4th Lunar Sci. Conf.* 2105-2113.

Eldridge J.S., O'Kelley G.D. and Northcutt K.J. (1973) Radionuclide concentrations in Apollo 16 lunar samples determined by nondestructive gamma-ray spectrometry. *Proc. 4th Lunar Sci. Conf.* 2115-2122.

von Engelhardt W., Hurrle H. and Luft E. (1976) Microimpact-induced changes of textural parameters and modal composition of the lunar regolith. *Proc. 7th Lunar Sci. Conf.* 373-392.

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

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.

Laul J.C. and Schmitt R.A. (1973b) Chemical composition of Apollo 15, 16, and 17 samples. *Proc. 4th Lunar Sci. Conf.* 1349-1367.

Laul J.C. and Schmitt R.A. (1973a) Chemical composition of Luna 20 rocks and soil and Apollo 16 soils. *Geochim. Cosmochim. Acta* **37**, 927-942.

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.

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.