12060

Soil

20.7 grams

Introduction

12060 are the fines from the "totebag" – which also contained four large basalt samples 12062 – 12065. 12061 (9.5 g) is made up of about 10 particles greater than 1 cm from same bag. The totebag was a large Teflon bag, not placed in the ALSRC. Abrasion of the rocks in the totebag probably led to the addition of crumbs of basalt in the bag, so that 12060 is probably not a representative soil sample. Instead it is probably dirt that was adhering to the surface of the basalts, mixed with crumbs from the basalts.

Petrography

The maturity index for 12060 is I_s/FeO = 24 (Morris 1987). McKay et al. (1971) found only 5 % "glazed aggregates" (agglutinates).

Frondel et al. (1971) determined the mineral mode, but did not specify agglutinates.

Chemistry

The chemical composition is only partially determined (figure 1 and table 1).

Other Studies

Arrhenius et al. (1971) studied the frequency of grains with high fossil nuclear tracks in 12060 (and all other Apollo 12 soil and core samples)(see diagram in 12070).

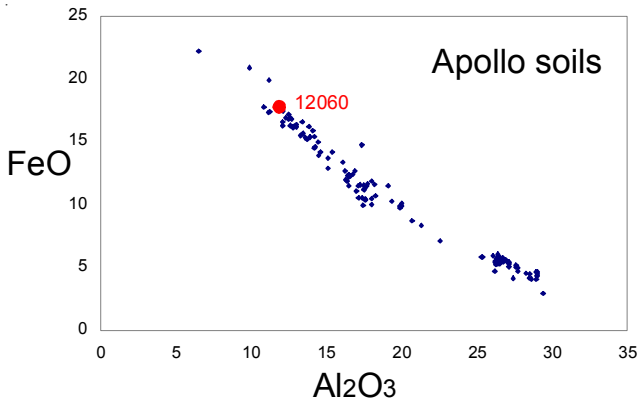


Figure 1: Composition of 12060 compared with that of other Apollo soil samples.

Processing

The "totebag" samples were handled in air by people in the LRL crew reception area for about 20 minutes (Warner 1970).

Some rare gas data is given in the Apollo 11 catalog (Warner 1970) and in LSPET (1970).

Schoemaker et al. (1971) state that 12060 was the scoop from the Surveyor, but that seems to be incorrect (see 12029).

Mineralogical Mode (250-1000 microns)

McKay et al. (1971)

Glazed Aggregates	5 %
Single xtl.	36
Glasses	12
Rocks	45
Breccias	0.7
Spherules	0.2

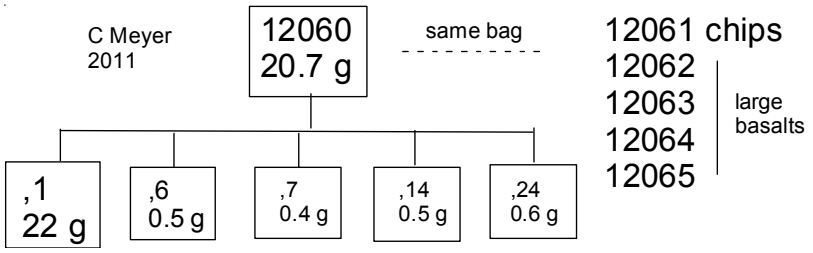
Mineralogical Mode

Frondel et al. 1971

Olivine + Pyroxene	60.4 %
Plagioclase	21.7
Opaques	10.5
Glass, angular	4.8
Glass, rounded	2
Silica	0.6

Table 1. Chemical composition of 12060.

reference	Frondel71	
weight	< 0.037 mm	
SiO2 %	45.3	(a)
TiO2	4.2	(a)
Al2O3	12.6	(a)
FeO	16.9	(a)
MnO	0.27	(a)
MgO	9.6	(a)
CaO	10.5	(a)
Na2O	0.38	(a)
K2O	0.2	(a)
P2O5		
S %		
sum		
Sc ppm		
V		
Cr	2189	(a)



References for 12060

Arrhenius G., Liang S., MacDougal D., Wilkening L., Bhandari N., Bhat S., Lal D., Rajagopalan G., Tamhane A.S., and Venkatavaradan V.S. (1971) The exposure history of the Apollo 12 regolith. *Proc. 2nd Lunar Sci. Conf.* 2583-2598.

Frondel C., Klein C. and Ito J. (1971) Mineralogical and chemical data on Apollo 12 lunar fines. *Proc. Second Lunar Sci. Conf.* 719-726.

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

Heiken G.H. (1974) A catalog of lunar soils. JSC Curator

Heiken G.H. (1975) Petrology of lunar soils. *Rev. Geophys. Space Phys.* **13**, 567-587.

LSPET (1970) Preliminary examination of lunar samples from Apollo 12. *Science* **167**, 1325-1339.

McKay D.S., Morrison D.A., Clanton U.S., Ladle G.H. and Lindsay J. (1971) Apollo 12 soil and breccias. *Proc. Second Lunar Sci. Conf.* 755-774.

Morris R.V. (1976) Surface exposure indicies of lunar soils: A comparative FMR study. *Proc. 7th Lunar Sci. Conf.* 315-335.

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

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

Shoemaker E.M. and 12 others (1970b) 10. Preliminary geologic investigation of the Apollo 12 landing site. *In* Apollo 12 Preliminary Science Rpt. NASA SP-235 page 113-156.

Warner J. (1970) Apollo 12 Lunar Sample Information. NASA TR R-353. JSC (catalog)