12057
Soil and particles
650 grams

**Introduction**
12057 consists of fines and chips from the bottom of the D-ALSRC (Warner 1970). As such it is probably not a typical soil, because it contains chips and fragments from the large samples returned in the same box. In any case it is soil that was collected from throughout the entire traverse.

**Petrography**
The maturity index for 12057 (fines) is I/I_{FeO} = 40 (Morris 1987). King et al. (1971) and Quaide et al. (1971) determined the grain size distribution with average grain size 72 and 84 microns, respectively. Frondel et al. (1971) determined the mineral mode, but did not specify agglutinates. McKay et al. (1971) reported 24 % “glazed aggregates”.

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**Mineralogical Mode**
*Frondel et al. 1971*
- Olivine +
- Pyroxene 56.3 %
- Plagioclase 26.1
- Opaques 7.5
- Glass, angular 6.1
- Glass, rounded 3.4
- Silica 0.7

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**Mineralogical Mode (250-1000 microns)**
*Mckay et al. (1971)*
- Glazed
- Aggregates 24 %
- Single xtl. 26
- Glasses 32
- Rocks 9
- Breccias 7
- Spherules 0.7

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Figure 1: Coarse-fine particles from 12057 on 1 mm sieve. S69-60959.

Figure 2: Composition of 12057 fines compared with other Apollo soils.
Keil et al. (1971), Bunch et al. (1972) and Busche et al. (1971) studied small lithic particles and glasses from 12057.

Dence et al. (1971) studied the textures and mineral chemistry of a large basalt particle from 12057 (figure 5). Carter et al. (1971), Sclar (1971) and Engelhardt et al. (1971) all reported on the shock features of basalt particles from 12057.

Billy Glass (1971) carefully studied the glass particles from different size fractions of 12057.
The carbon and nitrogen contents of 12057 have not been reported.

**Other Studies**

Arrhenius et al. (1971) studied the frequency of grains with high fossil nuclear tracks in 12057 (and all other Apollo 12 soil and core samples).

**Processing**

The D-ALSRC leaked air and was at about 0.5 atmosphere when opened in the LRL. The samples were then studied in nitrogen.

Several large chips of basalt were separated from the fines. It is not known if they were pieces of the large rocks returned in the D-ALSRC, or whether they are separate samples.

There are a large number of thin sections of the basalt particles – see flow diagram.

**Chemistry**

Compston et al. (1971) found that 12057 was high in FeO (figure 2). Frondel et al. (1971) reported an analysis of a finer fraction. A proper analysis of the REE content has not been made.
Table 1. Chemical composition of 12057.

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<thead>
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<th>reference</th>
<th>Compston71</th>
<th>Frondel71</th>
<th>Laul71</th>
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<tr>
<td>weight</td>
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<tr>
<td>SiO2 %</td>
<td>45.74 (a)</td>
<td>45.8 (b)</td>
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<td>TiO2</td>
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<td>S %</td>
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<tr>
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Technique: (a) XRF, (b) wet, (c) RNAA

References for 12057


Bunch T.E., Prinz M. and Keil K. (1972c) Electron microprobe analyses of lithic fragments and glasses from Apollo 12 lunar samples. Special Pub. #4, UNM Institute of Meteoritics, ABQ.


