

15558

15558      REGOLITH BRECCIA, GLASS-COATED      ST. 9?      1333.0 g

INTRODUCTION: 15558 is a regolith breccia derived mainly from mare components. It is gray, subangular, and has several large fractures (Fig. 1) and small areas of vesicular glass. A few zap pits occur on all surfaces. Its collection site is uncertain and its collection was not photographed, but it was probably collected at Station 9 (Bailey and Ulrich 1975).





Figure 1. Macroscopic views of original sample showing fractures, glass patch, basaltic clasts, and zap pits. S-71-45129 and S-71-45163

PETROLOGY AND EXPERIMENTAL PETROLOGY: 15558 contains mineral, lithic, and glass fragments and balls, set in a brown, glassy matrix (Fig. 2). Most of the lithic fragments are mare basalts with a range of textures, with a few Apollo 15 KREEP basalt fragments and only rare breccia fragments. Brown or colorless spheres are the predominant glass type.

Humphries et al. (1972) performed crystallization experiments on a synthetic 15558 composition ("Rille breccia" in Fig. 3). They found that plagioclase crystallized earlier than pigeonite and at a higher temperature than in the basalts: compared with bed-rock basalts, the breccia (and soil) is enriched in an Mg-norite or pyroxene-anorthosite component.

CHEMISTRY: Chemical analyses are listed in Table 1, and demonstrate similarities with Station 9 and 9A soils. According to Schonfeld (1975) the composition can be generated by a mixture of 33% brown breccia (other soil breccias), 45% olivine-normative basalt, 15% Apollo 15 KREEP, and 1.0% meteoritic and 0.4% granite components.

RARE GASES: Bogard and Nyquist (1972) reported Xe and Kr isotopic analyses for an interior chip, without specific discussion.

PROCESSING AND SUBDIVISIONS: Very little has been removed from 15558. A few small pieces, including ,4 and ,11 from which all the thin sections were made, were chipped. Subsequently the rock split along one of its fractures to produce ,21 (328 g), now in remote storage, and ,22 (944.2 g).

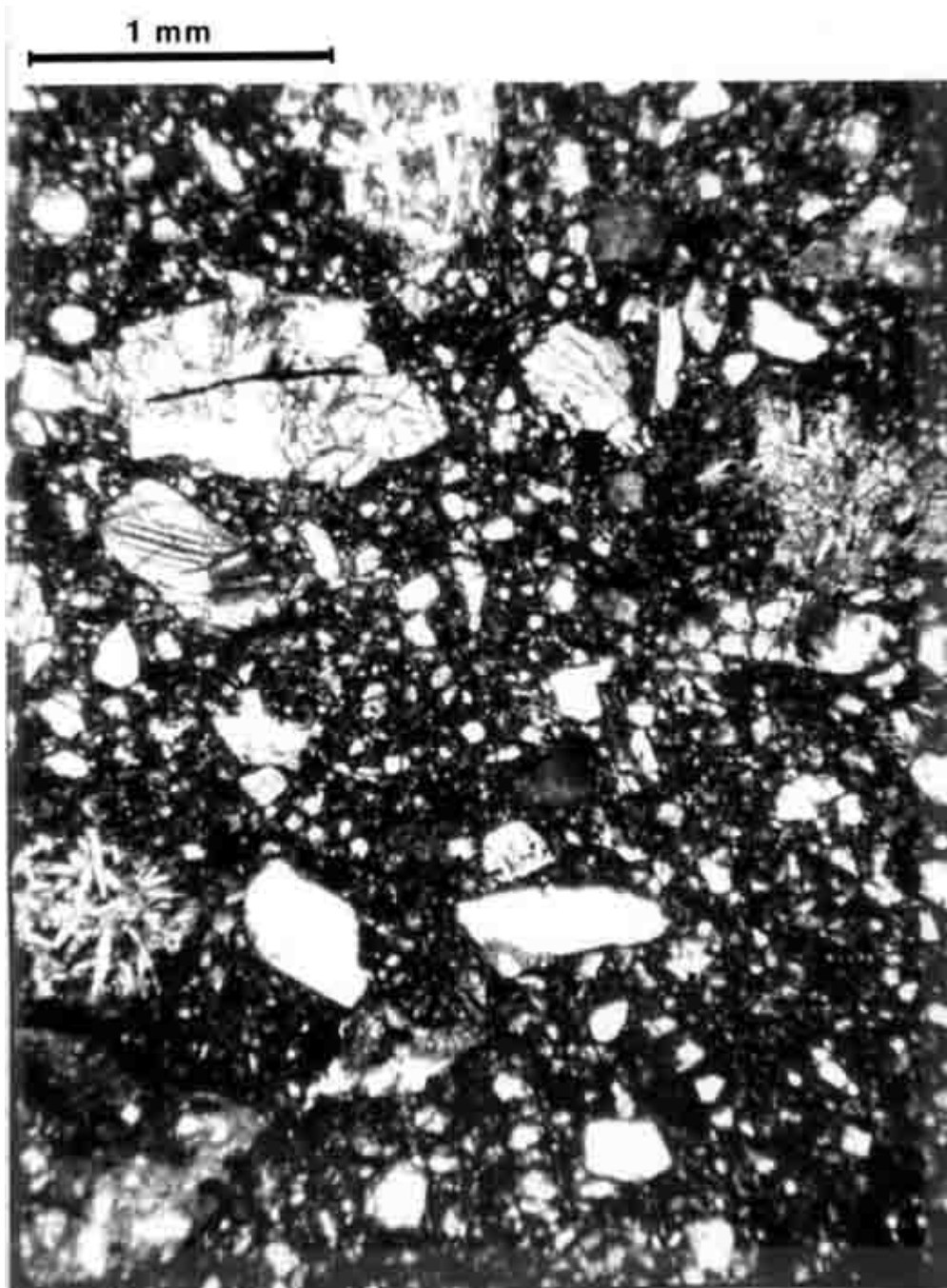


Figure 2. Photomicrograph of breccia matrix of 15558,9, transmitted light.

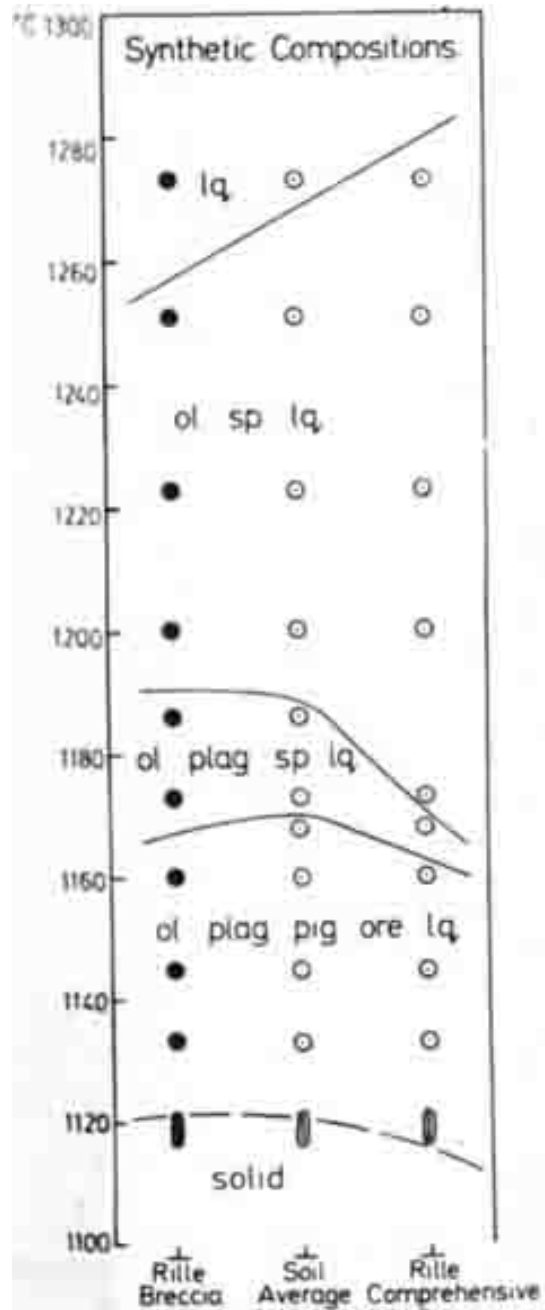


Figure 3. Experimental results of crystallization of a synthetic 15558 composition (black dots) and basalt and soil samples for comparison (Humphries et al., 1972).

TABLE 15558-1. Chemical analyses of bulk breccia

|                                | .2    | .2      |
|--------------------------------|-------|---------|
| Wt. % SiO <sub>2</sub>         | 46.31 |         |
| TiO <sub>2</sub>               | 1.89  |         |
| Al <sub>2</sub> O <sub>3</sub> | 12.40 |         |
| FeO                            | 16.54 |         |
| MgO                            | 10.51 |         |
| CaO                            | 10.18 |         |
| Na <sub>2</sub> O              | 0.42  |         |
| K <sub>2</sub> O               | 0.19  | 0.205   |
| P <sub>2</sub> O <sub>5</sub>  | 0.21  |         |
| (ppm) Sc                       |       |         |
| V                              |       |         |
| Cr                             | 3500  |         |
| Mn                             | 1700  |         |
| Co                             |       |         |
| Ni                             |       |         |
| Rb                             | 5.3   |         |
| Sr                             | 123   |         |
| Y                              | 78    |         |
| Zr                             | 356   |         |
| Nb                             | 22    |         |
| Hf                             |       |         |
| Ba                             |       |         |
| Th                             | 3.6   | 3.42    |
| U                              |       | 1.01    |
| Pb                             |       |         |
| La                             |       |         |
| Ce                             |       |         |
| Pr                             |       |         |
| Nd                             |       |         |
| Sm                             |       |         |
| Eu                             |       |         |
| Gd                             |       |         |
| Tb                             |       |         |
| Dy                             |       |         |
| Ho                             |       |         |
| Er                             |       |         |
| Tm                             |       |         |
| Yb                             |       |         |
| Lu                             |       |         |
| Li                             |       |         |
| Be                             |       |         |
| B                              |       |         |
| C                              |       | 110     |
| N                              |       |         |
| S                              | 900   |         |
| F                              |       |         |
| Cl                             |       |         |
| Br                             |       |         |
| Cu                             |       |         |
| Zn                             |       |         |
| (ppb) I                        |       |         |
| At                             |       |         |
| Ga                             |       |         |
| Ge                             |       |         |
| As                             |       |         |
| Se                             |       |         |
| Mo                             |       |         |
| Tc                             |       |         |
| Ru                             |       |         |
| Rh                             |       |         |
| Pd                             |       |         |
| Ag                             |       |         |
| Cd                             |       |         |
| In                             |       |         |
| Sn                             |       |         |
| Sb                             |       |         |
| Te                             |       |         |
| Cs                             |       |         |
| Ta                             |       |         |
| W                              |       |         |
| Re                             |       |         |
| Os                             |       |         |
| Ir                             |       |         |
| Pt                             |       |         |
| Au                             |       |         |
| Hg                             |       |         |
| Tl                             |       |         |
| Pb                             |       |         |
|                                | (1)   | (2) (3) |

References and methods:

- (1) PET (1972)
- (2) Moore et al. (1972, 1973)
- (3) Keith et al. (1972)