63355 POIKILITIC IMPACT MELT 68.2 g

INTRODUCTION: 63355 is a poikilitic impact melt with some variability in its macroscopic coloring and microscopic texture (Fig. 1).

63355 was taken from Shadow Rock with 60017 and 63335. It is fractured and consists of several chips but individual chips are tough. Patina and zap pits are present on one surface and portions of the surface are heterogeneous and bulbous. In some places where the rock has fallen apart, striations are present.


FIGURE 1. S-72-44016.

PETROLOGY: Misra and Taylor (1975) report metal compositions and Nord et al. (1975) report an electron petrographic study.

63355 is a poikilitic impact melt containing clasts and schlieren of cataclastic plagioclases and lithic material (Fig. 2). The dominant crystalline matrix consists of small orthopyroxene oikocrysts (electron diffraction identification; Nord et al., 1975) less than 500 μm long dimension and crowded with irregularly shaped plagioclases. The interoikocryst are as contain glass and ilmenite. Metal and troilite blebs are abundant. The thin sections include an 8 mm clast of feldspathic granulitic impactites (Fig. 2); in places near this clast the normal matrix consists of pyroxene oikocrysts less than 500 μm in diameter but the enclosed plagioclases are larger and more lath-shaped than elsewhere. Thin brown glass veins are present and in part form the feldspathic impactite/poikilitic melt boundary. The reflectivity of these veins suggests that they are mafic. In places these veins cause vitrification of the impactites and other clasts. Sharp boundaries between variable textures in the poikilitic melt suggest that shearing has occurred.

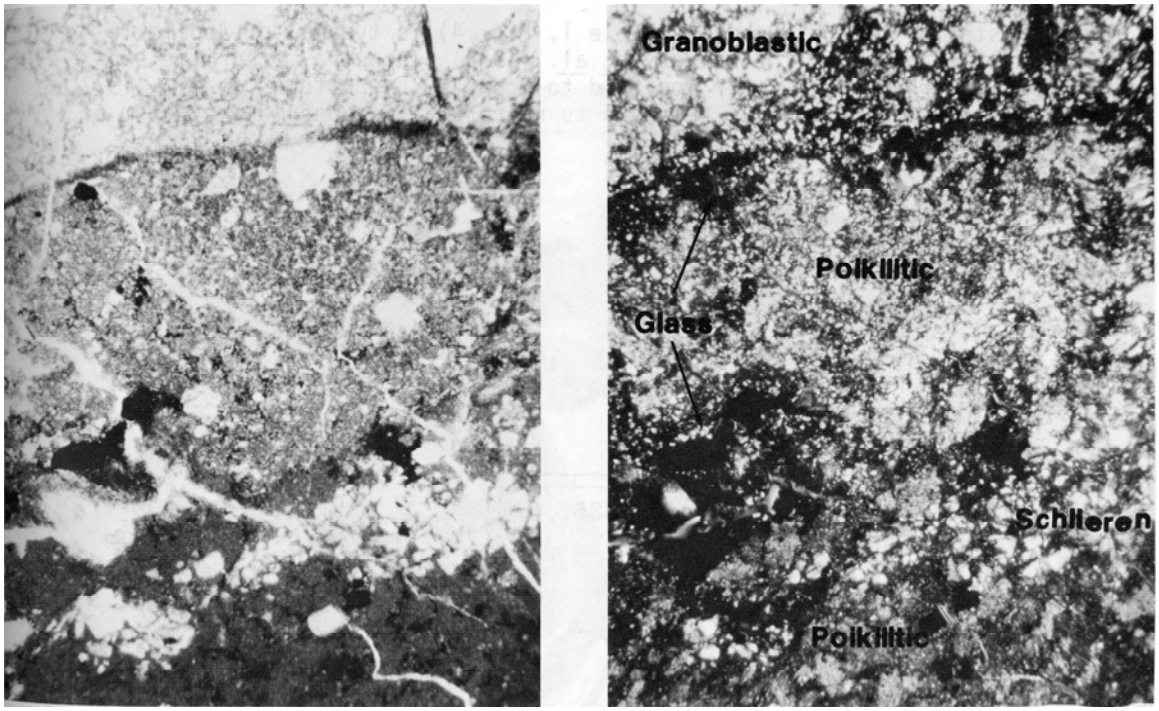


FIGURE 2. 63355,48.
a) Poikilitic matrix, granoblastic clast, glass veins, ppl. Width 2 mm.
b) Same view, xpl. Width 2 mm.

The metal compositions for the poikilitic melt (Misra and Taylor, 1975; referred to as light-matrix breccia) average 5.7% Ni and 0.3% Co with little variation (Fig. 3). The metal grains have a good development of polycrystalline structure due to annealing. Nord et al. (1975), referring to the melt as a dark matrix breccia, note the clast population of angular noritic and anorthositic fragments. All the plagioclase clasts show extreme deformation—maskelynite, deformation lamellae and so on. Parts of the matrix are glassy but without evidence of flow.

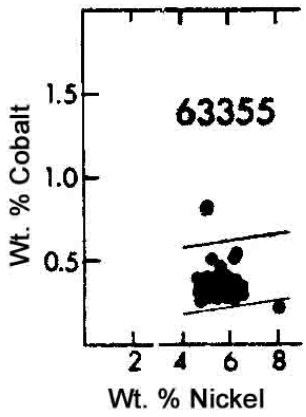


FIGURE 3. Metals, from Misra and Taylor (1975).

CHEMISTRY: Laul et al. (1974) report major and trace element data, Clark and Keith (1973) report K, U, Th and radionuclide abundances from γ-ray spectroscopy, and Ganapathy et al. (1974) report meteoritic siderophile and volatile abundances.

The chemistry of the bulk sample (Table 1, Fig. 4) is typical of Apollo 16 poikilitic impact melts. Ganapathy et al. (1974) place the meteoritic signature as their Group 1 (later modified to Group 1H by Hertogen et al., 1977, when Group 1 was subdivided), believed to represent the uppermost stratum of the Apollo 16 site.

PROCESSING AND SUBDIVISIONS: The sample was received as three large pieces and several smaller chips (Fig. 1). ,1 (43 g) and ,3 (10 g) are intact. ,2 was subdivided (Fig. 5) as was ,4 (Fig. 6). More daughters than shown on Figures 5 and 6 now exist.

TABLE 1. Summary chemistry of 63355.

| | |
|---|---|
| $SiO_2$ | |
| $TiO_2$ | 0.88 |
| $Al_2O_3$ | 21.5 |
| $Cr_2O_3$ | 0.17 |
| FeO | 8.3 |
| MnO | 0.09 |
| MgO | 8 |
| CaO | 12.0 |
| $Na_2O$ | 0.50 |
| $K_2O$ | 0.23 |
| $P_2O_5$ | |
| Sr | |
| La | 30 |
| Lu | 1.3 |
| Rb | 6.5 |
| Sc | 12 |
| Ni | 870 |
| Co | 62 |
| Ir ppb | 20 |
| Au ppb | 17 |
| C | |
| N | |
| S | |
| Zn | 5.2 |
| Cu | |

Oxides in wt%; others in ppm except as noted.

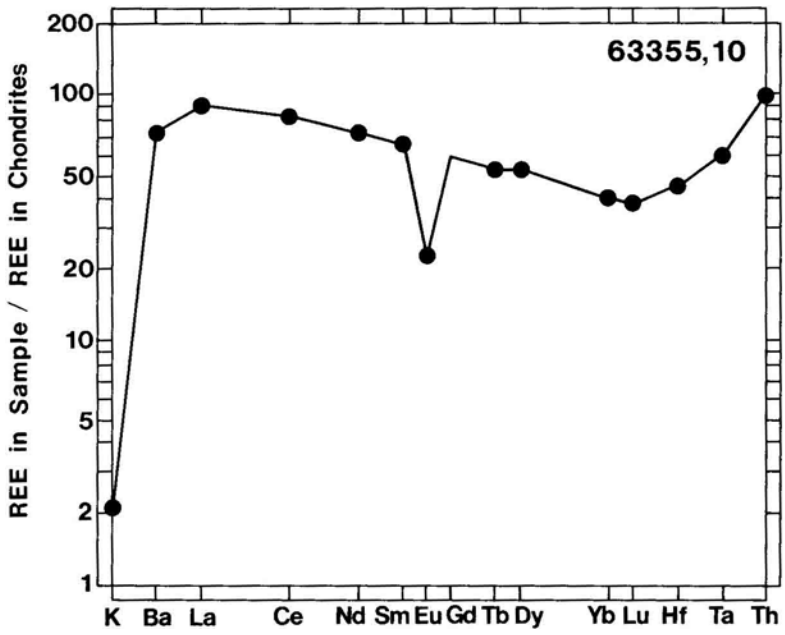


FIGURE 4. Rare earths, from Laul et al. (1973).

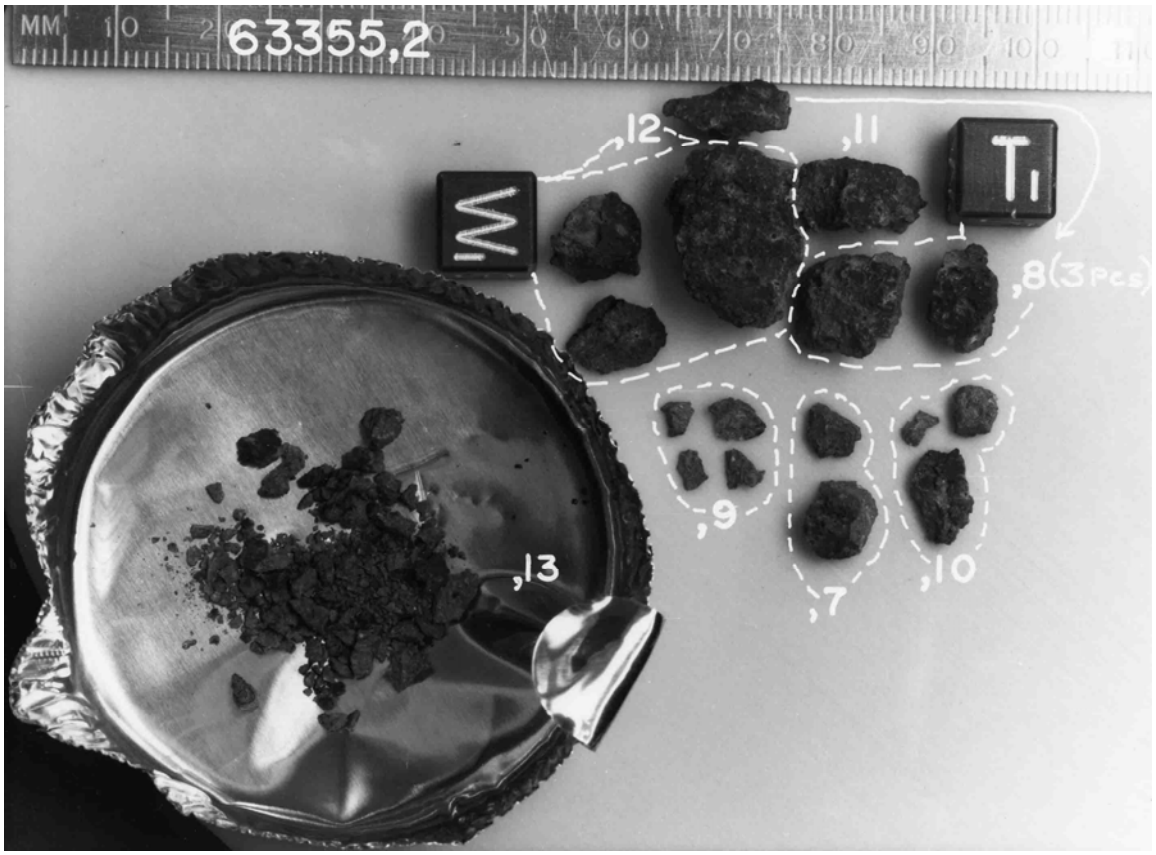


FIGURE 5. Subdivisions of 63355,2. S-73-28678.

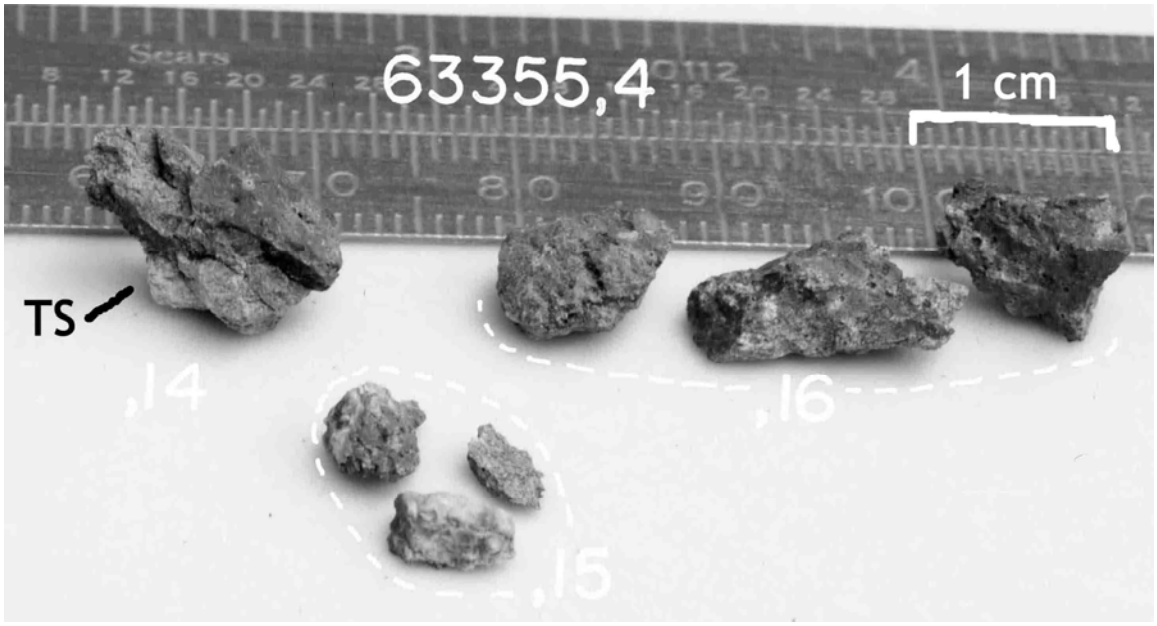


FIGURE 6. Subdivisions of 63355,4. S-73-28680.