

INTRODUCTION: 65075 consists of crystalline, clast-bearing material coated with black glass (Fig. 1). Although Grieve and Plant (1973) interpret the crystalline material as consisting of clasts of subophitic basalt in a recrystallized plagioclase-rich matrix, the textures are compatible with most of the sample being a basaltic impact melt of extremely variable texture. The hot emplacement of the glass coat caused partial melting to take place on the adjacent crystalline rock.

65075 was taken from the interior southwest wall of a 20 m crater on Stone Mountain and was probably about half buried. Although photographed prior to sampling, it was returned as 4 separate pieces, hence its orientation was not established. The sample is friable and the pieces are angular. Zap pits are present on only a few surfaces because of the breakages.

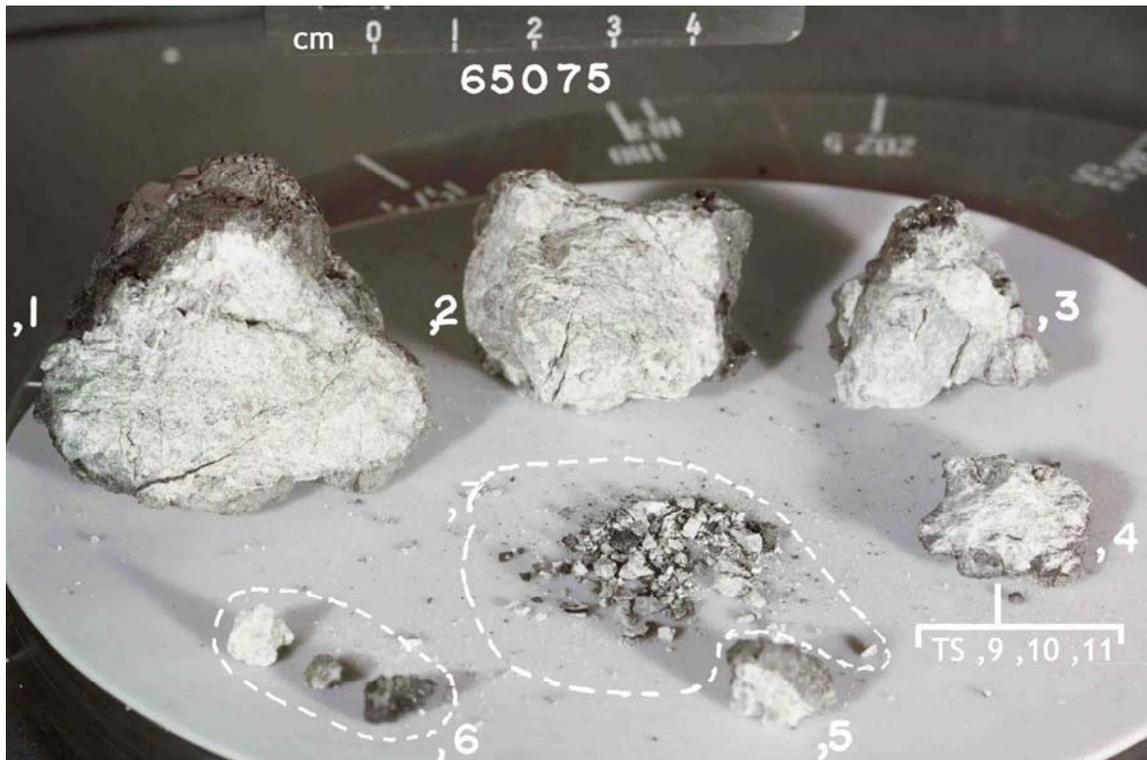


FIGURE 1. S-72-44643.

PETROLOGY: Grieve and Plant (1973) provide a petrographic description with microprobe data, particularly of bulk compositions of discrete lithic and glass types, with some mineralogical data.

The thin sections show that the crystalline material dominantly consists of ophitic and subophitic impact melt (Fig. 2), with some poikilitic melt areas. Distinct areas of fine-grained and more plagioclase-rich melts are present (Fig. 2). Grieve and Plant (1973) refer to the sample as a light matrix-light clast breccia and interpret the crystalline material (anorthositic gabbro breccia) as consisting of clasts of subophitic basalt in a recrystallized matrix. Its bulk composition has ~24% Al₂O₃, 0.31% K₂O and 0.72% TiO₂. Olivine (Fo₇₅) ophitically encloses plagioclase (An₉₅) and metal grains contain 1.4 - 4.9% Ni. Pigeonite, minor augite, ilmenite, and rare pleonaste spinels are also present. Fragmental plagioclases are extremely strained and cataclasized. The “anorthositic microbreccia” clasts (Grieve and Plant, 1973) consist of plagioclase laths with interstitial olivine and pyroxene; they contain shocked plagioclase clasts. Pleonaste spinel is present. This lithology is much more feldspathic (30% Al₂O₃) than the general crystalline material. In a few places, laths of plagioclase are optically continuous from these clasts into the general crystalline material. Because the entire breccia is crystalline and “clast” boundaries indistinct, it seems possible that most of the crystalline area is a single impact melt with extremely variable texture.

The crystalline material, including the feldspathic clasts, contain areas of partial melt (Fig. 2) described in detail by Grieve and Plant (1973). They are usually devitrified. These partial melts are variable in composition but in general have ~18% Al₂O₃ and are similar in composition to KREEP (low and medium-K Fra Mauro). The partial melt results from the heat introduced by the emplacement of the surface splash glass, which probably had a temperature >1350°.

The glass coat consists of an outer glass (0.75 mm maximum) which is devitrified to a mosaic of plates, and an inner zone up to 1.7 mm wide which is coarsely devitrified into acicular plagioclase (Fig. 2) (Grieve and Plant, 1973). The two areas have similar compositions with 25% Al₂O₃, and differ from the crystalline material in lower K₂O (0.06%) and TiO₂ (0.33%) abundances. Metal grains with ~20% Ni are present. The coat is not a melt of an older surface of the rock but is splashed on.

CHEMISTRY: Rancitelli et al. (1973b) report bulk rock K (0.161%), Th (2.89 ppm) and U (0.84 ppm) abundances from γ-ray spectroscopy, without comment.

EXPOSURE: Rancitelli et al. (1973a) report cosmogenic radionuclide (²²Na and ²⁸Al) data from γ-ray spectroscopy without comment. Yokoyama et al. (1974) list the sample as saturated with Al.

PROCESSING AND SUBDIVISIONS: The sample, received as four main pieces, is divided as shown in Figure 1.

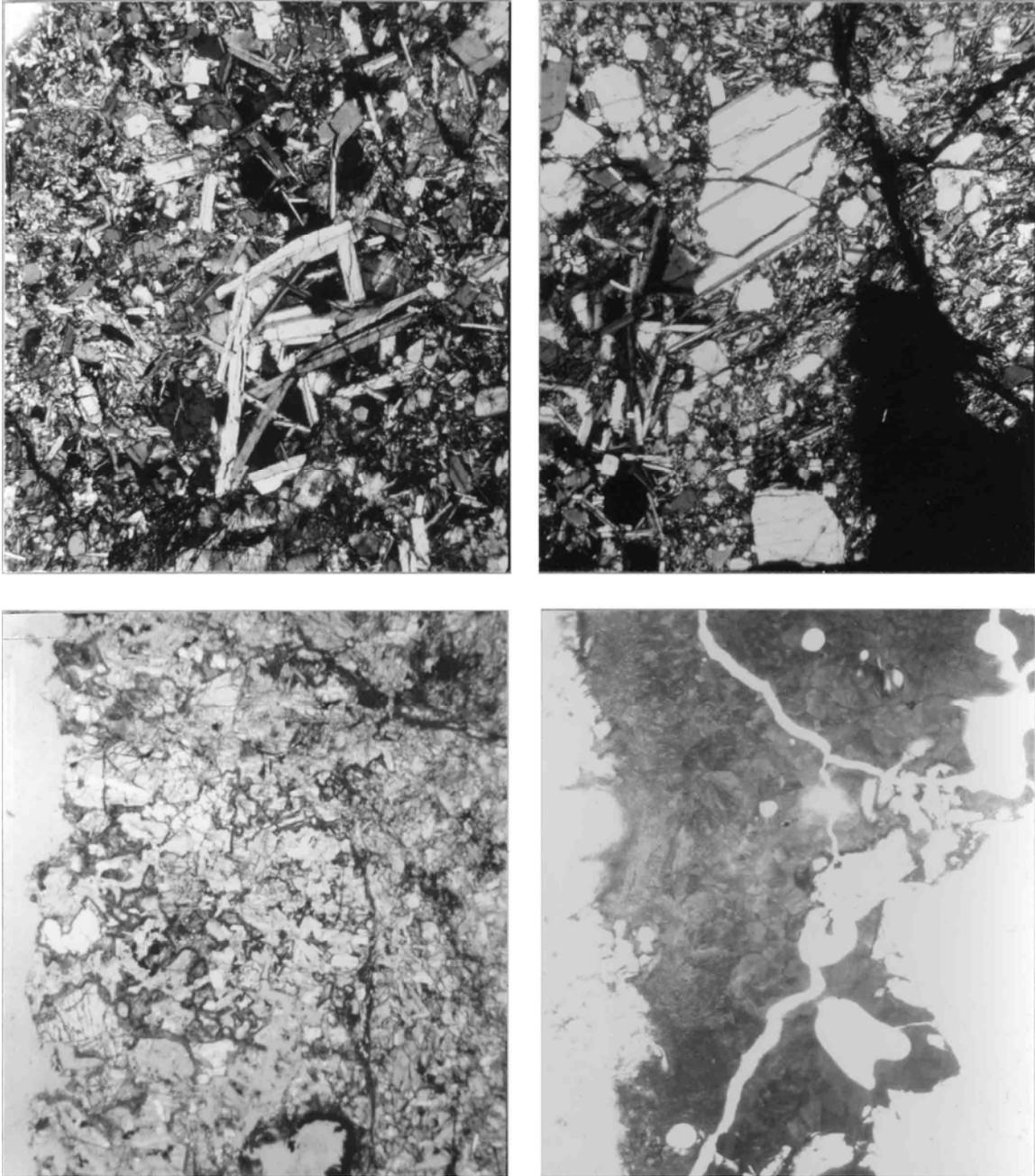


FIGURE 2. a) 65075,11. General heterogeneous melt, xpl. Width 2 mm.
b) 65075,11. Plagioclase-rich melt (right), xpl. Width 2 mm.
c) 65075,11. Interstitial melt, ppl. Width 2 mm.
d) 65075,10. Glass coat, ppl. Width 2 mm.