

64536 DILITHOLOGIC (ANORTHOSITE AND FINE-GRAINED 177.5 g
IMPACT MELT) BRECCIA

INTRODUCTION: 64536 is composed of two lithologies: white, friable, cataclastic anorthosite and dark, coherent, glassy impact melt (Fig. 1). Clast/matrix relations of the two lithologies are obscure. The impact melt is not simply a splash coating and seems to occur as clasts within the anorthosite. Apparently both lithologies were somewhat mobile during their emplacement in this rock.

This sample was collected as a rake sample from the rim of a small, subdued, crater on the upper slope of Stone Mountain. Lithologically it is very similar to 64535 and 64537, both rake samples from the same locality. Patina and a few zap pits are present on the T surface of 64536.

PETROLOGY: The white lithology is a coarse-grained, apparently monomict, cataclastic anorthosite with rare interstitial mafics (Fig. 2). Pre-cataclasis grain size ranged up to ~1 cm. Troilite is the only opaque phase present.



FIGURE 1. S-75-22681.

The dark lithology is a very fine-grained, glassy impact melt. Grain size is somewhat variable, but is never greater than ~0.1 mm. Relatively coarser grained areas have a basaltic texture (Fig. 2) while the finer-grained portions are faintly poikilitic. Metal and troilite are common. Angular clasts of plagioclase and mafics are also present.

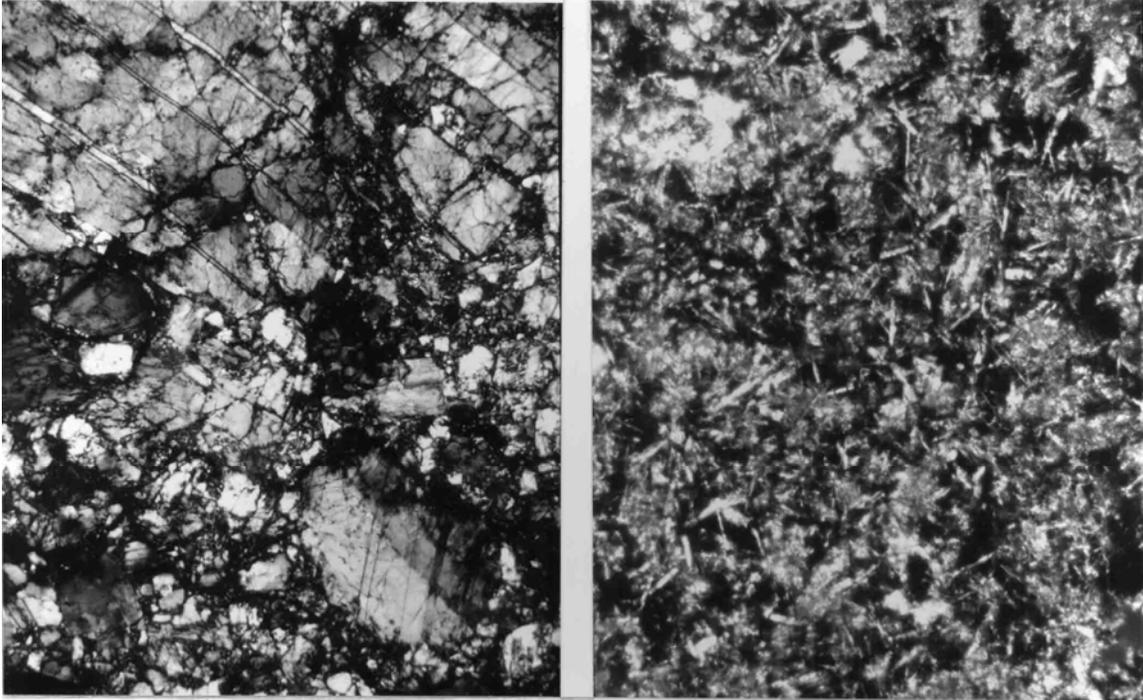


FIGURE 2. a) 64536,23, anorthosite, xpl. Width 2 mm.
b) 64536,25, impact melt, ppl. Width 0.5 mm.

CHEMISTRY: Ca and K data on the anorthosite (,3) and the impact melt (,12) are given by Jessberger et al. (1977). The anorthosite appears to be virtually pure plagioclase (16.7% CaO, 265 ppm K), while the impact melt is much less feldspathic and considerably more potassic (9.4% CaO, 1410 ppm K).

RADIOGENIC ISOTOPES/GEOCHRONOLOGY: Jessberger et al. (1977) report K-Ar isotopic data on the anorthosite (,3) and the impact melt (,12). An ^{40}Ar - ^{39}Ar plateau age of 3.97 ± 0.01 b.y. was obtained from the anorthosite (Fig. 3). The impact melt did not yield a good plateau: two apparent age regimes are present. A low temperature fraction (3-47% ^{39}Ar) gives an age of 4.14 ± 0.02 b.y. while a high temperature fraction (57-99% ^{39}Ar) gives an age of 3.83 ± 0.02 b.y. The geochronological significance of either age is “spurious at present” (Jessberger et al., 1977).

EXPOSURE AGES: ^{38}Ar exposure ages of 1.7 ± 0.2 m.y. and 2.4 ± 0.3 m.y. for the anorthosite (,3) and the impact melt (,12), respectively (Jessberger et al 1977), are consistent with the excavation of 64536 by the South Ray Crater event.

PROCESSING AND SUBDIVISIONS: In 1975 several small pieces were chipped from 64536 for allocations (Fig. 4). Many of these chips and the parent (,0; 147.24 g) remain in stock at JSC.

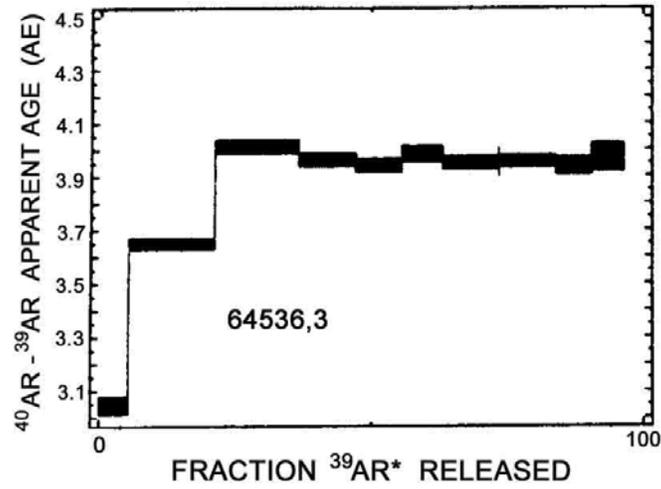


FIGURE 3. Ar releases, from Jessberger et al. (1977).

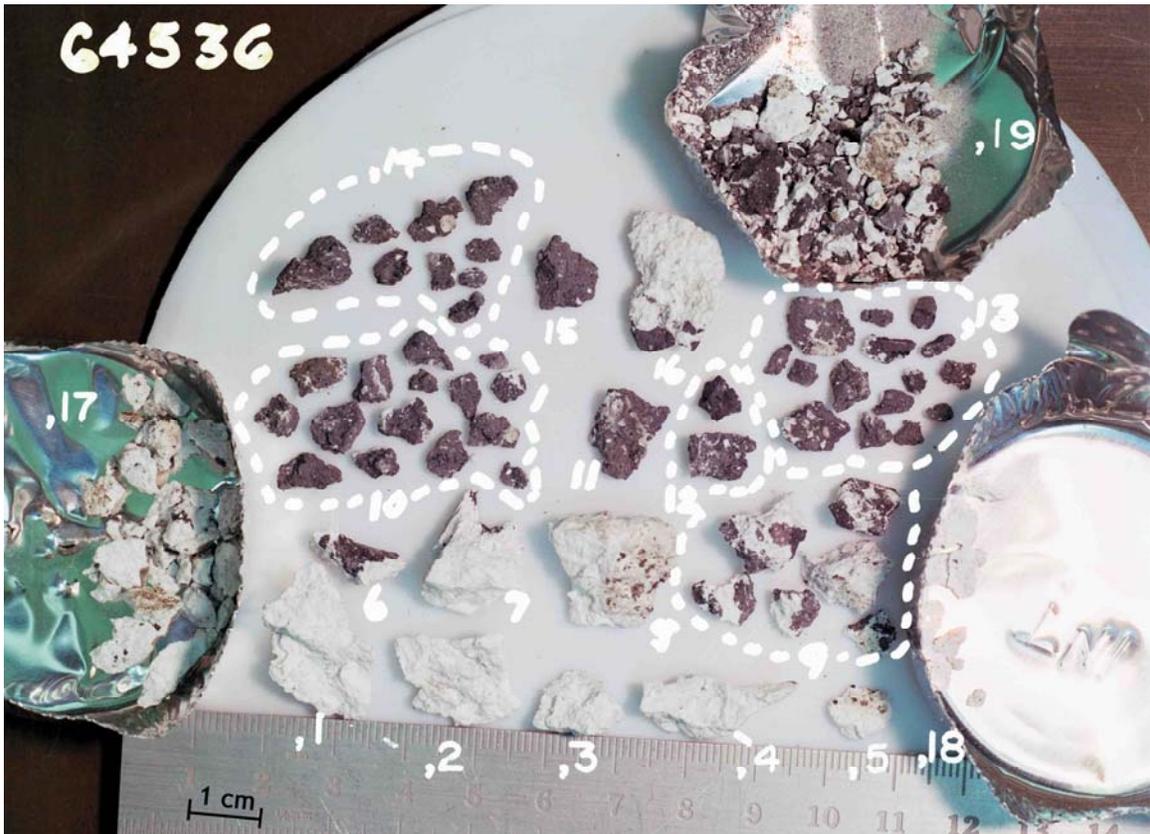


FIGURE 4. S-75-22682.