

**72135****Microbreccia****336.9 g, 8 x 6 x 5.5 cm****INTRODUCTION**

72135,0 was described as a medium gray, blocky, subangular microbreccia (Apollo 17 Lunar Sample Information Catalog, 1973) (Fig. 1). Glass was present on one surface of the original sample and ,0 exhibited a friable character with irregular penetrative fractures. The surface was very hackly, many zap pits on B, a few on S and W, and none on N, E, and T. 72135,0 was described as being "surprisingly heavy for its friable character" (Apollo 17 Lunar Sample Information Catalog, 1973), Less than 1% of the surface contained cavities and these were irregular and

unlined. The macroscopic features (i.e., clast population) are presented in Table 1.

**PETROGRAPHY AND MINERAL CHEMISTRY**

The Apollo 17 Lunar Sample Information Catalog (1973) gave a description of thin section 72135,11. This section is composed of pyroxene, ilmenite and plagioclase, together totaling 75 modal %. The remainder is made up of ilmenite (19%) and olivine (6%) microphenocrysts. The texture is variolitic (Fig. 2) with a groundmass of quenched pyroxene, ilmenite, and

plagioclase. Patches up to 3.5 mm containing coarser pyroxene are scattered through the rock. Ilmenite and skeletal olivine form microphenocrysts. The rock is broken and irregularly seamed by thin stringers of brecciated basalt, locally glass. It was noted in the Apollo 17 Lunar Sample Information Catalog (1973) that this thin section was probably not representative of the rock because it is predominantly in a clast and does not show much of the brecciated part of the rock.

A description of the opaque mineralogy of 72135,11 was given by Brett in the Apollo 17 Lunar Sample Information

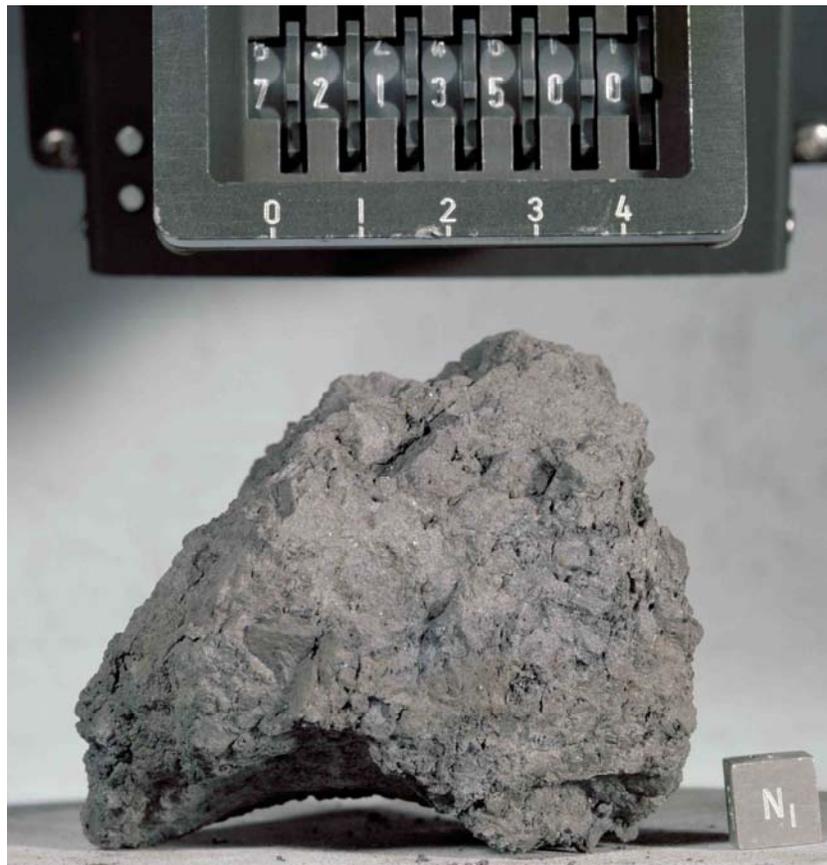


Figure 1: Sample 72135.

**Table 1: Lithology of microbreccia 72135.**

Component	Color	Percent of rock	Shape	Size (mm)		Notes
				Dom.	Range	
Matrix	N4-5	90-95		<<0.1	Up to 1	1
Glass	?	5-10				2
Clasts		<5	Round-irregular		To 2	3

1. Composed of plagioclase, ilmenite, brown pyroxene, dark glass (no spheres), trace of olivine, trace of red translucent mineral, trace of chalky white material. Matrix is fragmented into irregular, blocky fragments bounded by shear surfaces.
2. Partly cements clods of matrix on one side of rock; filled with soil.
3. One clast of basalt with olivine phenocrysts. Others appear to be vary vaguely bounded, shocked, friable fragments. Scarce ilmenite, rare olivine to 1 mm.

Catalog (1973). He found a "bimodal distribution of ilmenite, with large blocky laths commonly greater than several tenths of a millimeter and feathery laths in the aphanitic groundmass commonly smaller than 0.02 mm. The ilmenite enclosed in phenocrysts and elsewhere may have blocky, rectangular or lozenge shapes,

reminiscent of armalcolite replacement. Several areas (one along a fracture) of diffuse ilmenite staining are present, apparently unrelated to the presence of metal grains".

Brown et al. (1975 a,b) classified 72135,41 as a slowly cooled Type IB high-Ti basalt. This thin section contains 0.3% olivine,

38.5% opaques, 15.1% plagioclase, 45.3% clinopyroxene, and 0.8% silica.

**WHOLE-ROCK CHEMISTRY**

Cripe and Moore (1975) reported a whole-rock sulphur content for 72135,24 2100 ug/g which was a weighted average of replicate

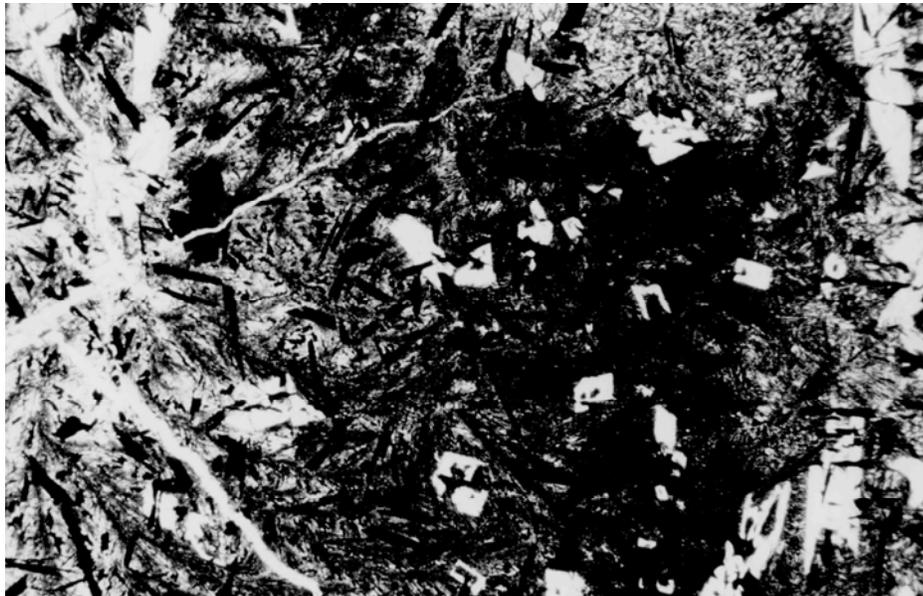


Figure 2: Photomicrograph of 72135,11 in plane polarized light. Width of field = 3.16 mm.

analyses. Moore and Lewis (1976) reported whole rock carbon (12 pg/g) and nitrogen (49 ug/g) for 72135,24.

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### EXPERIMENTAL STUDIES

O'Hara and Humphries (1975) used 72135 in a study of armalcolite crystallization, phenocryst assemblages, eruption conditions, and origin of Apollo 17 high-Ti basalts. These authors used 72135 in Mo capsules at a constant  $fO_2$  and then also in various containers with different  $fO_2$  conditions. Results demonstrate that higher  $fO_2$  favors spinel over armalcolite crystallization.

Green et al. (1975) described 72135 as a monomict basaltic breccia in which individual fragments range from fine-grained, quenched basalt to spheres and irregular shards of orange glass. Green et al. (1975) inferred that 72135 is a welded tuff or volcanic breccia due to lava fountaining of a liquid of composition of the glass fragments. These authors report mineralogical data for 72135 and use the glass composition to determine a liquid line of descent at 0 kbar.

Longhi et al. (1978) used a powdered portion of 72135 in their experiments to determine the distribution of Fe and Mg

between olivine and lunar basaltic liquids.

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### PROCESSING

Of the original sample, 289.66g of 72135,0 remains. The largest remaining subsamples are: ,15 ~ 6.43g; and,16 ~16.04g. Thirteen thin sections of 79035 have been made: ,11-, 14; ,40-,48.