

72539**Microsubophitic impact Melt Breccia
St. 2, 11.2 g****INTRODUCTION**

72539 is a fine-grained clast-bearing impact melt with a subophitic groundmass texture. Its chemistry is similar to the common low-K Fm Mauro melts that dominate the Apollo 17 highlands samples.

72539 was one of several blue-gray breccias (LSIC 17, 1973) collected in the fast rake sample from Station 2, adjacent to Boulder 2. It is 2.5 x 2.5 x 1.3 cm and medium dark gray

(N4) (Keil et al., 1974). It is subrounded (Fig. 1) and coherent, with a few non-penetrative fractures. It has about 4% vesicles, and a few zap pits. The clast-matrix contrast is a little sharper than in other blue-gray breccias, partly because the matrix is among the most fine-grained. Matrix material (less than 100 microns grain size) was estimated to compose 91% of the rock (Keil et al., 1974).

PETROGRAPHY

72539 is a very fine-grained crystallized melt, similar to 72535 and 72536 but finer-grained. (Fig. 2a). It differs in that the opaque grains are extremely minute (less than 1 micron) and tend to be clustered at the edges of mafic grains. Warner et al. (1977b,c; 1978f) described 72539 as a microsubophitic matrix breccia. Their modal data (Table 1) shows a high proportion of melt groundmass (88%) and a clast population



Figure 1: Sample 72539. S-73-19632. Smallest scale divisions in millimeters.

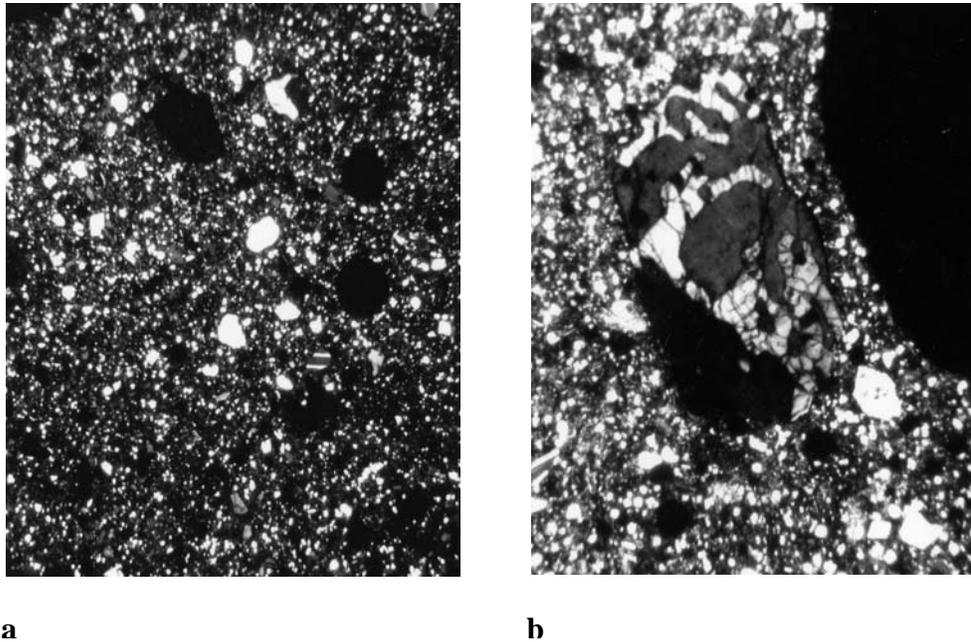


Figure 2: a) Photomicrograph of 72539,5 showing general groundmass. Dark areas are mainly vesicles. Crossed polarized light; width of field about 1 mm. b) Graphic granite fragment (center) and vesicle (upper right) in 72539,5. Crossed polarized light; width of field about 500 microns.

dominated by plagioclase, similar to many other impact melt samples at the Apollo 17 site. Warner et al. (1977b,c; 1978f) described the groundmass as having a well-developed igneous texture. Microprobe analyses (Warner et al., 1978f) are shown in Figure 3. The groundmass olivine, which is prominent and euhedral, has a narrow range of compositions (Fo₇₀₋₇₄). Engelhardt (1979) tabulated ilmenite paragenetic features, inferring that ilmenite crystallization started after plagioclase but before pyroxene.

Plagioclase clasts dominate the mineral fragment population, but pink spinels are present. A variety of feldspathic lithic clasts is present, including poikiloblastic norites and devitrified anorthositic fragments. Several granitic fragments are present, including one prominent one with a graphic

texture (Fig. 2b) that contains a silica phase, a K-feldspar phase, and a ternary feldspar phase (Warner et al., 1977b).

CHEMISTRY

The only analysis is a defocused beam analysis for the major elements (Table 2). The composition is similar to that of many other Apollo 17 impact melts.

PROCESSING

A few exterior chips were taken from a single area of the sample in 1974. Chip,1 was used for the thin section, which consists of four serial slices. The other chips remain unallocated.

Figure 3: Microprobe analyses of minerals in 72539 (Warner et al., 1978P. Filled symbols = matrix symbols = mineral clasts and cross-hatched = minerals in lithic circles = mineral clasts and open triangles = minerals in lithic clasts.

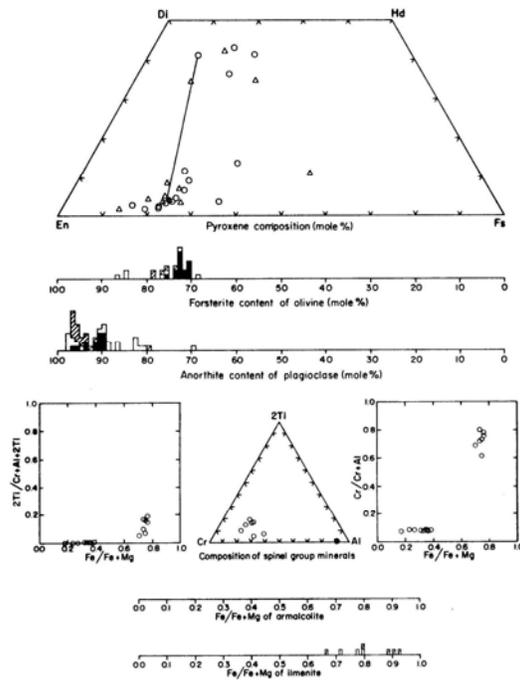


Table 1: Modal analysis of 72539,5 (Warner et al., 1977b).

Points counted	4072
Matrix	87.7
Mineral clasts	7.6
Lithic clasts	4.7
Mineral clasts	
Plagioclase	5.5
Olivine/pyroxene	1.9
Opaque oxide	0.1
Metal/troilite	0.1
Other	tr
Total	7.6
Lithic clasts	
ANT	1.2
Devitrified anorthosite	0.9
Breccia	2.2
Other	0.4
Total	4.7
Percent of matrix (normalized to 100)	
Plagioclase	51.6
Olivine/pyroxene	45.0
Opaque oxide	2.5
Metal/troilite	0.4
Other	0.6

Table 2: Microprobe defocused beam analysis of matrix of 72539 (from Warner et al., 1977b)

wt%	
SiO ₂	47.1
TiO ₂	1.77
Al ₂ O ₃	17.4
Cr ₂ O ₃	0.15
FeO	8.4
MnO	0.12
MgO	11.1
CaO	11.3
Na ₂ O	0.59
K ₂ O	0.16
P ₂ O ₅	0.28
Sum	98.4