

72558**Micropoikilitic Impact Melt Breccia
St. 2, 5.71 g****INTRODUCTION**

72558 is a fine-grained clast bearing impact melt. Although its chemistry was reported to differ from most other melts at the Apollo 17 site in being higher in potassium, an unpublished analysis for major and trace elements shows that it is similar to the common low-K Fra Mauro melts that are presumed Serenitatis melts. It was also reported to contain more clastic material than most of the local impact melt samples; possibly

the sampled chip was unrepresentative.

72558 was one of several green-gray breccias (LSIC 17, 1973) collected in the fast rake sample from Station 2, adjacent to Boulder 2. It is 1.8x1.5x 1.4 cm and medium gray (N5) (Keil et al., 1974). It is subangular and coherent, with no fractures (Fig. 1). It has a few zap pits and about 1 % vugs. Matrix material (mainly less than 100 micron grain size) was estimated to compose 92% of the

rock (Keil et al., 1974). Thin sections show a higher abundance of clasts, and the sample might be more heterogeneous than most melts.

PETROGRAPHY

72558 is a crystallized impact melt containing lithic and mineral clasts (Fig. 2, Table 1). Warner et al. (1977b,c; 1978f) described 72558 as a microgranular-micropoikilitic matrix breccia, similar to 72549 but



Figure 1: Sample 72558. Smallest scale divisions in millimeters. S-73-33460

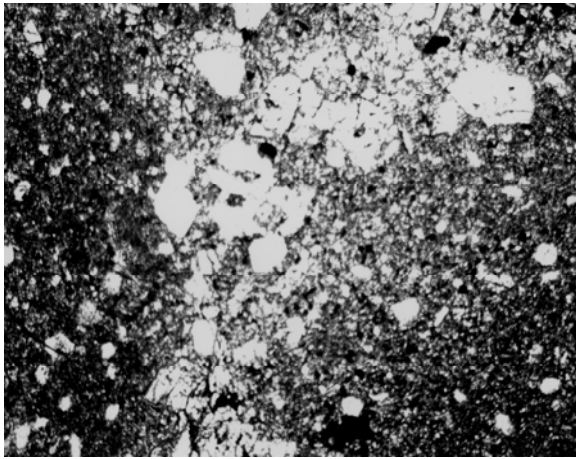


Figure 2: Photomicrograph of 72558, 5, showing general groundmass, mineral clasts, and lithic schlieren. Plane light; width of field about 1mm.

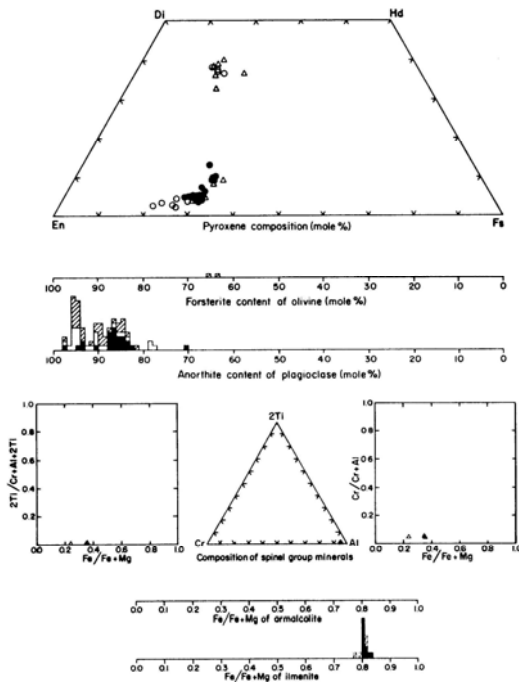


Figure 3: Microprobe analyses of minerals in 72558 (Warner et al., 1978f) Filled symbols = matrix phases. In histograms, open symbols = mineral clasts and cross-hatched = minerals in lithic clasts. In other diagrams, open circles = mineral clasts and open triangles = minerals in lithic clasts

with mafics almost wholly pyroxene. They distinguished 72258 with 72735 as a high-K KREEP breccia on the basis of the high K_2O (0.57%) evident in the However, this is probably not the case (see CHEMISTRY section). Nonetheless, there is a lack of olivine, and several other differences from most local impact melts. The grain size is coarser than that of the microsubophitic melts represented by 72535. The modal data (Table 1) shows a low proportion of melt groundmass (52%), and the clast population is dominated by lithic clasts, unlike most melts. Microprobe analyses (Warner et al., 1978f) are shown in Figure 3; the matrix pyroxenes are more iron-rich than those in other melts, and more varied in composition. There is interstitial K-rich phase. Quite likely, the chip is unrepresentative or possibly even a clast. Engelhardt (1979) tabulated ilmenite paragenetic features, inferring that ilmenite crystallization was simultaneous with plagioclase and pyroxene.

The mineral and lithic clasts almost exclusively appear to be derived from coarse-grained feldspathic rocks. In many cases it is in schlieren or obscurely-defined masses. One plagioclase grain poikilitically encloses several pink spinels.

CHEMISTRY

The only published analysis is a defocused beam analysis for the major elements (Table 2). The analysis is unlike that of most other impact melts from the Apollo 17 site in that it contains higher silica, lower titania, and lower mg, but most significantly in its higher K_2O . However, an analysis of a chip for major and trace elements (Ryder, unpublished) shows that 72558 is identical with the common low-K Fra Mauro basalt that is inferred to be the Serenitatis impact melt.

PROCESSING

The sample was broken to produce a few documented pieces during chipping in 1974.. The only original allocation was ,1 which was made into two thin sections. A subsequent allocation was made for chemistry.

Table 1: Modal analysis of 72558,5 (Warner et al, 1977b).

	72558
Points counted	1098
Matrix	51.9
Mineral clasts	9.0
Lithic clasts	39.1
Mineral clasts	
Plagioclase	4.8
Olivine/pyroxene	4.1
Opaque oxide	—
Metal/troilite	0.1
Other	—
Total	9.0
Lithic clasts	
ANT	38.8
Devitrified anorthosite	0.1
Breccia	—
Other	0.2
Total	39.1
Percent of matrix (normalized to 100)	
Plagioclase	53.9
Olivine/pyroxene	40.9
Opaque oxide	1.7
Metal/troilite	0.5
Other	3.0

Table 2: Microprobe defocused beam analysis of matrix of 72558
 (from Warner et al., 1977b).

<u>wt %</u>	
SiO ₂	50.2
TiO ₂	0.76
Al ₂ O ₃	19.4
Cr ₂ O ₃	0.16
FeO	8.5
MnO	0.16
MgO	8.7
CaO	11.3
Na ₂ O	0.85
K ₂ O	0.57
P ₂ O ₅	0.25
Sum	100.9