

## 14068

Sample 14068 was collected during the second EVA from station C' and placed in bag number 10. It is one of the surface rocks collected while a gray layer, just under the surface, was samples (14140-14143) at station C'.

### PHYSICAL CHARACTERISTICS

Mass

35.47 g

Dimensions

4.2 x 3.2 x 2.7 cm

This is a blocky, gray, coherent, holocrystalline, melt rock with less than 5% clasts.

### SURFACE FEATURES

The surface contains numerous zap pits ranging in size from 0.1 to 0.7 mm.

The only cavities are those produced by intersecting fractures. Numerous non-planar fractures appear in multiple sets averaging 2 mm in length.

Some vugs or vesicles are visible in thin section.

### PETROGRAPHIC DESCRIPTION

Sample 14068 is a walnut-size holocrystalline melt rock with large grains of plagioclase up to 1 mm across; making up 5% of the rock. The grain size is very small, with average grains less than 0.1 mm.

Thin section 14068,8 shows the matrix clusters and fans of devitrification crystals hosting larger, partly eroded mineral fragments. The thin section also shows a high percentage (10-15%) of void areas 0.05-0.2 mm. No crystals extend into the voids and the shape of the voids is irregular to rounded.

### DISCUSSION

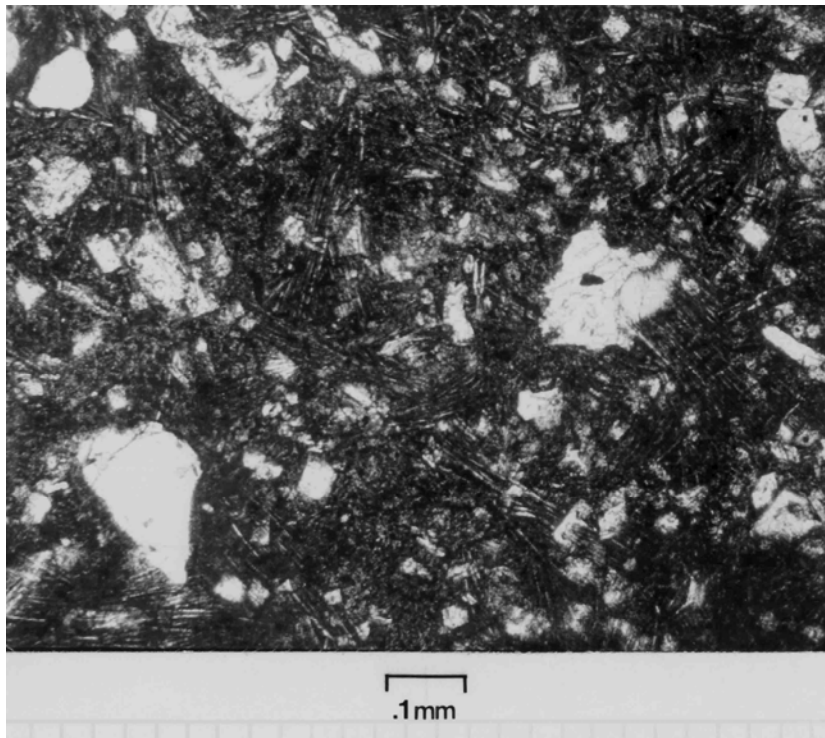
Sample 14068 has been studied in detail by several investigators. It is the only sample representing Warner's (1972) grade 8, a high grade metamorphic breccia with neither matrix glass nor glass clasts. The large percentage of MgO reported by Hubbard et al. (1972) accounts for the 20% olivine occurring as skeletal crystals in the matrix and as clasts reported by Warner (1972). Warner found no glass in the matrix and rare, partly devitrified glass clasts. Mineral and lithic clasts are described as having ragged borders. The average plagioclase composition is reported by Warner as being  $An_{73}Or_7$ . Pyroxene averages  $En_{72}$ , and olivine compositions are reported as  $Fo_{77}$  to  $Fo_{79}$  for prisms and  $Fo_{67}$  to  $Fo_{84}$  for clast cores. Warner interpreted 14068 as having been heated to so high a temperature that the matrix melted. Williams (1972) found the temperature required to melt it to be at least 1100°C.

Wilshire and Jackson (1972) classified it as a homogeneous crystalline metabreccia.

It is classified as a clast laden impact melt rock (CMB) by Simonds et al. (1977).



Width of image approximately 5 cm, S-71-30338



14068,8

Helz (1972) did an extensive petrographic and chemical study of 14068, which included making a detailed map of 14068,10 and smaller sketches of 14068,7 and 14068,11. She accounts for the observed features with a petrogenetic outline of the history of rock 14068:

- 1) The melting, involving temperatures beyond the igneous range, was the result of meteorite impact. The molten bleb produced was fairly small.
- 2) The melt picked up plagioclase clasts and nickel-iron blebs. There was sufficient turbulence for the clasts to be mixed throughout the bleb.
- 3) The melt picked up the olivine, orthopyroxene, lithic and glassy fragments. Most of the glassy clasts softened and vesicular.
- 4) The melt made contact with some of the dark breccia ("north" side) while still quite fluid.
- 5) The melt made contact with the dark breccia on the "south" side while still plastic, but it was not as fluid as in step 4.
- 6) Rock 14068 has not been involved in any major brecciation or thermal metamorphic events since solidification of the olivine-rich groundmass was completed.