

14041-14046

Samples 14041 - 14046 are fragments from a fractured clod that broke apart when it was collected by Astronaut Mitchell. They were collected from Station A, 150 m NW of the LM and 90 m N of North Triplet crater. Samples 14041, 14042, 14043, and 14045 are large enough to be considered rocks. Sample 14044 is residue and sample 14046 is composed of chips and fines. They were placed in documented bag 3N and returned in ALSRC 1006.

PHYSICAL CHARACTERISTICS

Mass	Dimensions
14041 166.3 g	8.0 x 5.0 x 4.0 cm
14042 103.2 g	5.5 x 4.0 x 4.2 cm
14043 5.9 g	3.5 x 1.8 x 1.8 cm
14045 65.2 g	7.0 x 4.0 x 3.0 cm

These rocks are all part of a friable fine-grained clastic rock with less than 5% clasts. Sample 14043 has a considerably higher proportion of clasts but is otherwise similar.

SURFACE FEATURES

Glass-lined microcraters cover the exterior faces of the rocks. Glass spatter covers 5% of the surface on one end of sample 14041. A small clod (4 x 5 mm) is welded to this glass coating. Some zap pits are visible in the glass coating. Glass coating is also present on 1 - 2% of the surface of 14042. Sample 14042 has pits from 1 - 6 mm in size with a density of 1 or 2 pits per square centimeter, which is approximately 10 times the abundance on sample 14041. Pits are also present on sample 14043 and 14045, occurring on rounded surfaces. Numerous fractures are present on all these rocks.

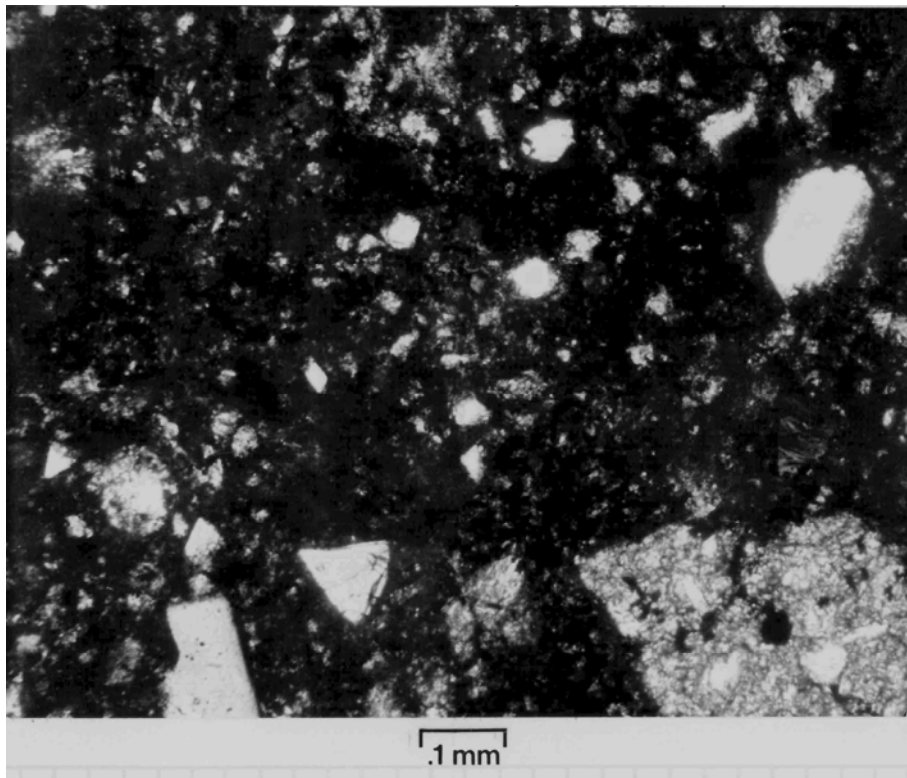
PETROGRAPHIC DESCRIPTION

These rocks are very friable and have an average grain size of less than 0.1 mm with very few clasts. Mineral as well as lithic fragments occur, with white feldspar, cinnamon brown pyroxene, and pale yellow olivine fragments recognizable in all but 14043. Opaques are rare (less than 1%) with ilmenite and metallic iron present up to 100 μ m in diameter. Lithic clasts contain ilmenite, blebs of metal, and one or two contain troilite to about 15 μ m diameter as observed under the binocular microscope.

Thin section 14041,6 is glass rich, and would be classified as a VMB using the classification of Simonds et al. (1977). There are only two clasts (> 1 mm) present in the section. Both clasts are plagioclase-rich breccias with a partly glassy matrix. The first type has distinct plagioclase crystal fragments and shows only minor shock effects. The second type has no distinct plagioclase fragments and the crystals all show moderate to strong shock effects. In the second type the pyroxene crystals show some micro-faulting.



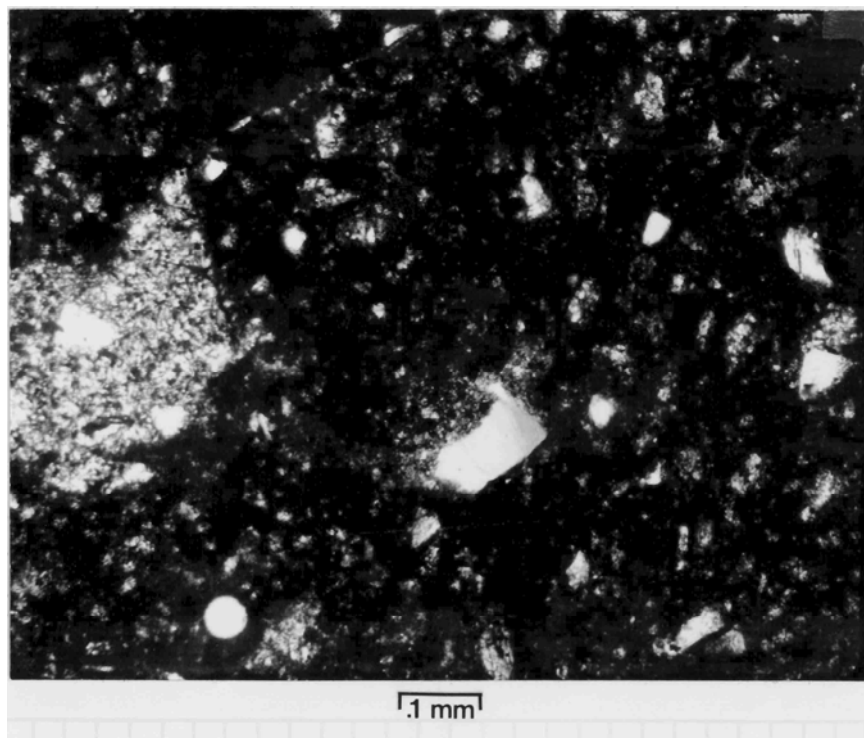
14041: Width of image is approximately 8.5 cm; S-71-33224



14041,6



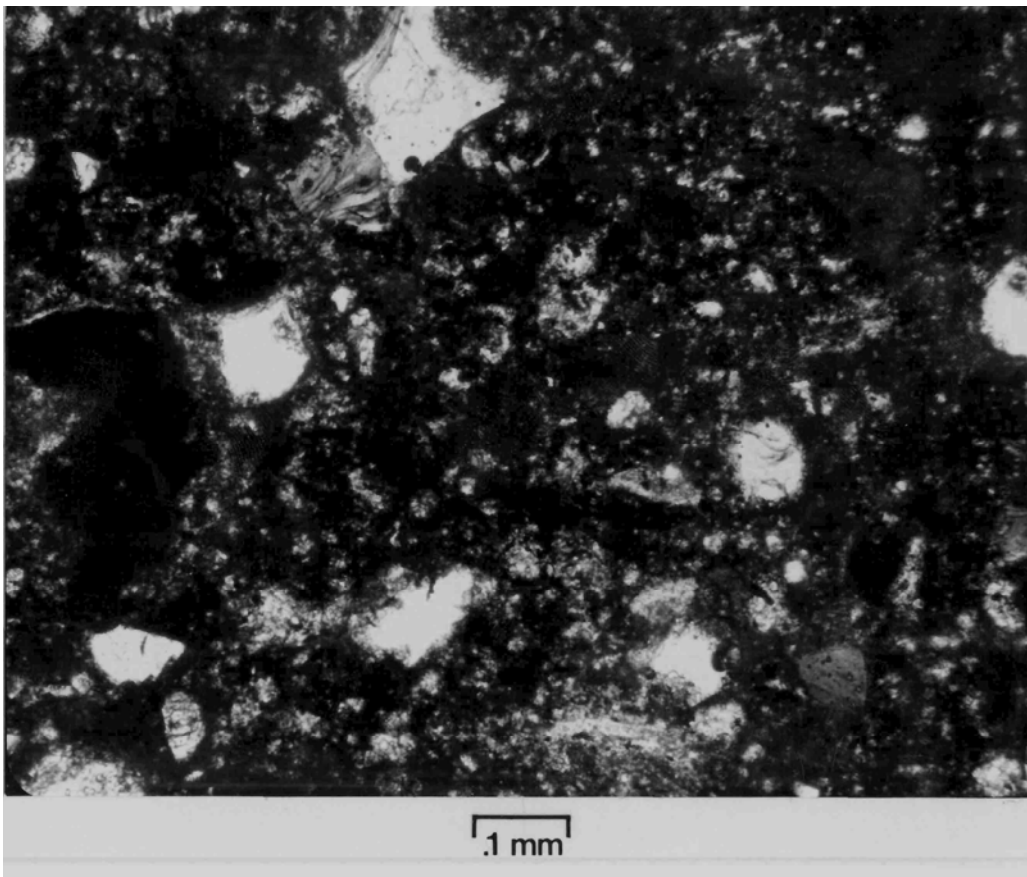
14042 Width of image is approximately 6 cm; S-71-31441



14042,18



14045: Width of image is approximately 7.5 cm; S71-29175



14045,8

14043 No Image

The matrix of the rock consists of approximately 50% of a yellowish brown glass which is nearly opaque. There are numerous gray glass spherules scattered throughout. There are also several large blocky masses of glass present which show minor devitrification. The remainder of the matrix is composed of crystal fragments of plagioclase and pyroxene with minor lithic fragments. Most of the crystal fragments contain abundant inclusions. Approximately 1/3 of the matrix is lithic fragments and 2/3, crystal fragments.

Most of the lithic fragments resemble the second type of clast described previously. A few scattered chondrule-like bodies are also present. Almost all of the matrix material shows some shock effects.

Samples 14042,18 and 14042,19 are similar to 14041,6. These thin sections contain abundant spherical glassy clasts and are VMB's using the classification of Simonds et al. (1977). Only small mineral and lithic clasts are present in these sections. Sample 14042,18 has a much higher glass content and fewer clasts than does 14042,19. Clasts are all small and most are lithic. Rock types recognized include basalt with an intersertal texture, anorthositic breccia, and devitrified rock fragments. One basalt clast with a coarse grained diabasic texture is present in 14042,19. Several pyroxene clasts are present and are scattered throughout the sample. All of the pyroxene grains have many inclusions. More glass clasts are present in sample 14042,18 than in 14042,19. Sample 14042,12 was studied by Phinney et al. (1976) who describe it as containing 2-3% matrix glass with 35% porosity. It is described as friable, with some shattered grains. Matrix glass has a filament texture with many 5-10 μm size grains. Most matrix grains fall in the 1-5 μm size range, with many smaller than 1 μm . Grains are angular to sub-angular in shape.

Sample 14045 also contains glass in the matrix. Thin section 14045,8 contains approximately 20% matrix "glass". In addition, there are large areas of devitrified glass present and some very small crystalline fragments. A few glass masses exhibit signs of flowage.

Almost all the fragmental glass occurs as shards, with few spheres and spherical fragments visible. One small crystalline breccia clast is present. It is composed of pyroxene with minor plagioclase. All clasts are microbreccia fragments with included mineral fragment shards and 5% amorphous material in the matrix.

DISCUSSION

Samples 14041, 14042, and 14045 have recently been classified as VMB's by Simonds et al. (1977), and were classed as F₁'S by Wilshire and Jackson (1972). Sample 14042 was placed in Warner's (1972) metamorphic grade 1 and classified by Chao et al. (1972) as a regolith microbreccia which is unshocked and porous (1a).