

14319

Breccia sample 14319 is the western rock from the top of Turtle Rock ("turtle egg"). This sample as well as 14312 were collected from Turtle Rock at station H during the second EVA and returned in weigh bag 1038. Its lunar orientation and location have been well documented. It appears to be similar to Turtle Rock and the other rocks in the area.

PHYSICAL CHARACTERISTICS

Mass

211.6 g

Dimensions

8 x 5.5 x 3.9 cm

This is a light-medium gray coherent breccia which is flat on one side and rounded on the other sides.

SURFACE FEATURES

The rock is rounded and pitted on all but one side which is flat and partly covered with glass. Pits range from 0.1 to 3 mm in diameter, averaging about 0.5 mm. The glass is dark brown in hand specimen and forms a 0.5 - 1.0 mm thick coating.

There is a set of fractures subparallel to the long axis of the rock which are fragile and ready to break.

PETROGRAPHIC DESCRIPTION

This is a polymict breccia, with 90% of the clasts greater than 1 mm being lithic and 10% rounded feldspar crystals up to 2 mm long. The most common clast type (90%) is medium dark gray, equant to elongate, subangular to rounded, crystalline granular microbreccia. These microbreccia fragments consist of 50% medium gray feldspar, 45% white to colorless feldspar laths, yellow-green olivine, and cinnamon-brown pyroxene. Approximately 10% of the lithic clasts are small (1 - 2 mm) crystalline basalt fragments composed of colorless feldspar, light brown pyroxene, and black opaques. One large feldspar fragment has a rim of opaques completely around the margins. The matrix is made up of feldspar > 1 mm lithic clasts, a yellowish mineral (feldspar?), opaque specks, red brown pyroxene, and lemon yellow olivine (?).

Examination of sections 14319,2 and 14319,13; as well as chips 14319,8; 14319,8A; and 14319,10 by Winzer as part of the PET (1971) indicates that this sample is a gray-green, fragment-laden melt containing basaltic, anorthositic, noritic, and predominately breccia clasts, along with fragments of minerals and glass. Minerals include olivine, pyroxene, opaque minerals, and plagioclase, with plagioclase the major phase present. Olivine is a minor phase, and there are, also, a few reddish-orange spinel fragments observed. Some devitrification of the glass present has occurred, mainly as a growth of very small euhedral feldspar crystals. Large "poikilitic" pyroxenes were not observed.

Most clasts are breccias. Those breccia clasts which are not glassy or partly devitrified fragment-laden melts appear to be anorthositic in nature. One relatively large anorthositic clast was observed in 14319,2. The dominant igneous clast is basaltic. These are, normally, either of a "felted" texture, or are microgabbroic. Norite (or gabbro) clasts are secondary. These noritic clasts contain more feldspar than the basaltic clasts, and do not usually contain olivine. Opaque phases occur as small, rounded, metal grains, or as irregular ilmenite. Brett (LSPET, 1971) described the opaques in 14319,5 as similar to 14318,2 except lacking in chrome spinel,

ulvospinel, and zircon. Troilite is more abundant, occurring as fine rounded to subrounded blebs to 10 μm , and larger aggregates of grains as large as 80 μm .

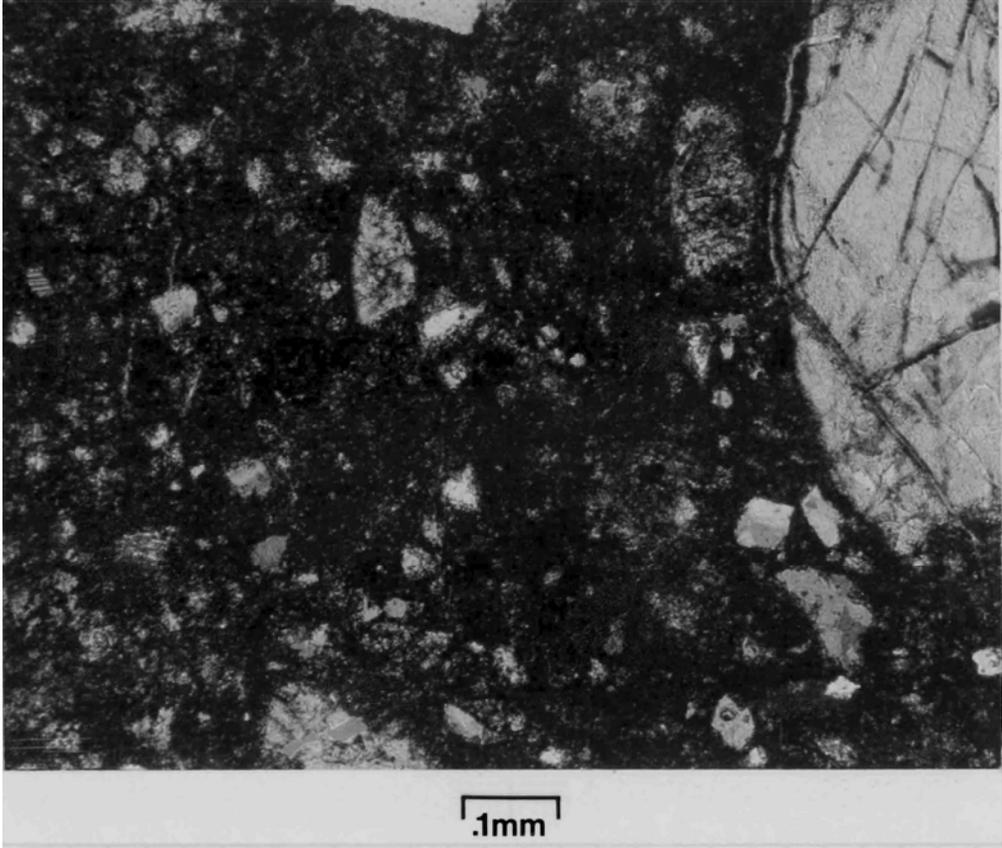
DISCUSSION

Sample 14319 was found to be an F₄ breccia (coherent, dark clasts) by Wilshire and Jackson (1972) and a high metamorphic grade (7) by Warner (1972). Chao et al. (1972) classify it as a strongly annealed, shocked, Fra Mauro breccia (2c). Simonds et al. (1977) list it as a crystalline matrix breccia.

The sample was also investigated by Roedder and Weiblen (1972) in their study of melt inclusions, and they found evidence that the sample had a complex thermal history.



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