14276

PHYSICAL CHARACTERISTICS

Mass	Dimensions
12.75 g	3.0 x 2.2 x 2.0 cm

Sample 14276 is a brownish-gray, blocky, coherent, medium-grained, crystalline rock.

SURFACE FEATURES

Few zap pits are present. Irregularly shaped vugs from 0.2 to 1 mm make up 10% of the rock. Some penetrative fractures are present.

PETROGRAPHIC DESCRIPTION

Sample 14276 is a blocky, subrounded, coherent, crystalline rock. It is medium-grained and homogeneous in texture. White to clear plagioclase is 60 - 65% of the sample. It occurs as laths up to 0.5 mm in sizes and in ellipsoidal areas up to 2.0 mm in size which contain crushed equigranular grains smaller than 0.1 mm in size. Fifteen percent of the sample is a light yellow-brown mafic mineral which occurs as subhedral equant grains 0.2 - 0.4 mm in size and in ellipsoidal areas up to 3.0 mm in size. The mineral is probably pyroxene in two distinct morphologies. The ellipsoidal areas contain crushed equigranular grains. A light yellow-green euhedral mineral up to 0.3 mm in size, probably olivine, is less than 1% of the sample. A brown mafic mineral, probably euhedral pyroxene, is 5 - 10% of the sample. An anhedral, slightly gray, mafic mineral is 10% of the sample, and 1 - 2% is black opaque, probably ilmenite.

Thin section 14276,14 shows a plagioclase-rich crystalline rock with small anhedral masses of pyroxene between the blades of plagioclase in a diabasic-like texture. There are at least two and perhaps three generations of plagioclase present. The rock is approximately 70% plagioclase and 30% pyroxene. Small to large patches of opaque crystals are scattered throughout the section.

DISCUSSION

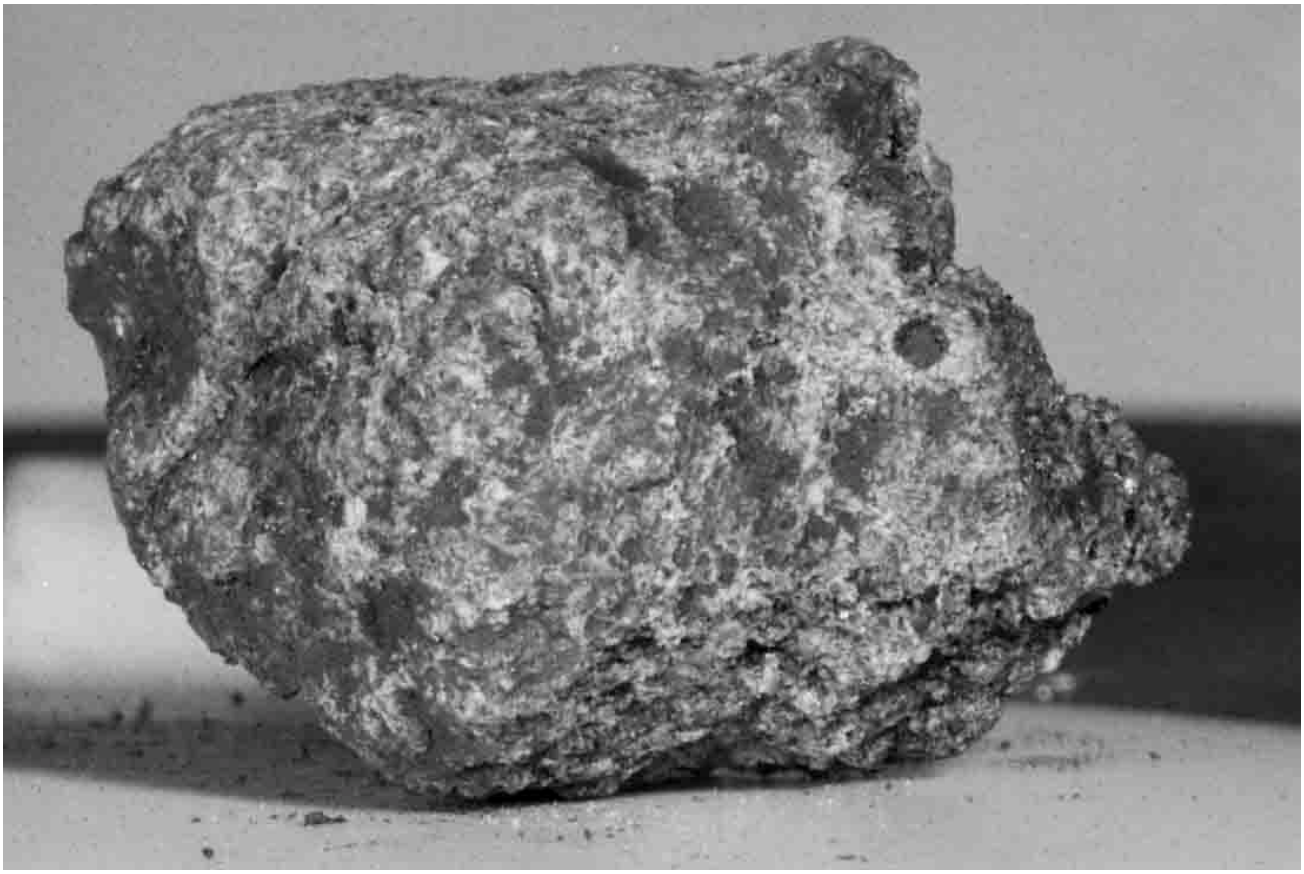
Sample 14276 is listed as a basalt by Wilshire and Jackson (1972) and as a melt rock by Simonds et al. (1977).

Wasserburg and Papanastassiou (1971) described sample 14276 as closely resembling sample 14310 in thin section. The age they determined for this sample is in exact agreement with ages obtained on samples 14310, 14073, and 14001,7, which are described as having similarly high Rb/Sr. This age was determined to be 3.88 ± 0.04 billion years before the present, and is distinct from the 3.95 ± 0.03 b.y.b.p, obtained for basalt 14053 and a basaltic clast from sample 14321 (Papanastassiou and Wasserburg, 1971). These data were interpreted by Wasserburg and Papanastassiou (1971) as indicating that Mare Imbrium was excavated between 3.88 and 3.71 billion years ago, if the Fra Mauro Formation represents an ejecta blanket from this excavation. If the Apollo 14 samples are, instead, breccias produced in localized lava pools overlying the Fra Mauro Formation, then Mare Imbrium must have been formed before 3.95 billion years ago.

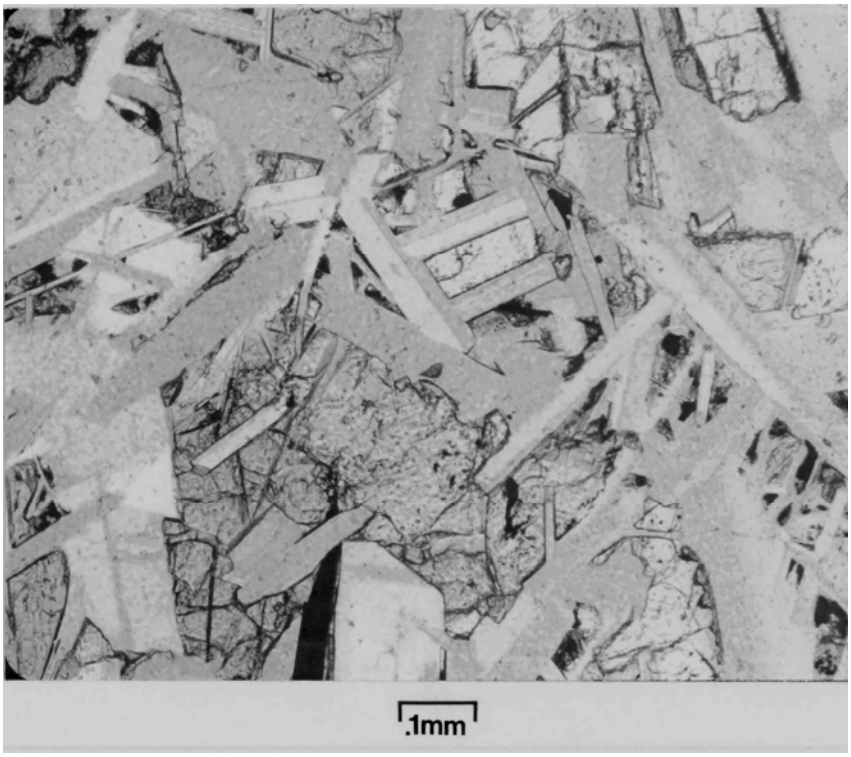
Gancarz et al. (1972) described sample 14276 in order to compare it and sample 14310 with sample 68415, which is texturally similar to 14276 and 14310. They studied section 14276,13, which consists of a subophitic, inter*g*ranular to interstitial basalt composed of 65% plagioclase, 33% pyroxene, 2% opaque min*e*rals (mostly ilmenite), and 4% mesostasis containing glass and other minor phases. The texture is unlike that of Apollo 11 and 12 basalts and also unlike that of

sample 14053. Gancarz et al. (1972) further describe the sample as consisting of 0.5 mm long, euhedral, plagioclase laths which form an interlocking framework with anhedral pyroxene grains and mesostasis in the interstices. Phenocrysts exhibit an optical discontinuity and a reversal in composition. Phenocryst rims are zoned to more Ab-rich compositions (i.e., An_{74} vs. An_{87}). Individual pyroxene grains are described as consisting of a low birefringent orthopyroxene core surrounded by higher birefringent clinopyroxene which displays a weak mosaic structure.

Gancarz et al. (1972) conclude, on the basis of the observed differences between these so called feldspathic basalts, and mare basalts, that there are two generations of plagioclase, the earlier of which was cumulate in origin and suggested that this type of basalt may form by impact melting of regolith. Simonds et al. (1977) adhere to this theory and call these basalts "melt rocks" and “clast-free impact melts."



Width of image is approximately 3.5 cm, S-71-26626



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