

XENOLITHS OF THE TRIASSIC PASSAIC FORMATION IN THE MONOCACY HILL DIABASE INTRUSION, AMITY TOWNSHIP, BERKS COUNTY, PENNSYLVANIA

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Tabular xenoliths occur as outcrop and float on Monocacy Hill in eastern Pennsylvania. The xenoliths reach a maximum thickness of 2 feet (61 cm). Relict bedding is prominent in some of the xenoliths. Textures range from very fine to coarse.

The xenoliths show varying effects of assimilation into the diabase magma. These range from xenoliths showing no visible reaction to totally melted immiscible blobs or schlieren of white plagioclase melt in diabase. This melt borders many of the xenoliths. Other xenoliths are penetrated by thin intrusions of the magma. Pyroxene trondhjemite borders some of the xenoliths, and some outcrops along the southwest slope of Monocacy Hill have melted borders of granophyre.

Two types of diabase are associated with the xenoliths. A medium grained diabase is intruded by a fine-grained almost phenocryst free diabase. Orthopyroxene and magnetite are common reaction minerals in the vicinity of the xenoliths. At some of the fine grained diabase xenolith contacts, olivine crystallized in the diabase magma.

In thin section, poikiloblastic, porphyroblastic, and granoblastic textures are commonly seen in the xenoliths. Both monoclinic and orthorhombic pyroxenes are present along with plagioclase, magnetite, wollastonite, sphene, apatite, rare quartz, olivine, garnet and zircon. Alteration minerals are sericite, chlorite and serpentine. Pyroxenes are usually anhedral, forming bands of crystals alternating with fine grained plagioclase. Pyroxene also forms chain like groupings around plagioclase porphyroblasts. The intense green sodium pyroxene forms the groundmass and replaces large plagioclase porphyroblasts in some xenoliths. Wollastonite forms fibrous crystals. Zircon, sphene and olivine are associated with the wollastonite. Magnetite forms subhedral porphyroblasts. Quartz and feldspar form rare micrographic patches between large plagioclase crystals.

The xenoliths represent high temperature low pressure contact metamorphism of lacustrine mudstones, argillite and impure limestone by diabase magma. The xenolith mineralogy is that of the pyroxene hornfels facies. This is the highest grade of contact metamorphism found in the Pennsylvania portion of the Newark Basin.

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