Introduction

The current State of Maine is underlain by a complex, Palaeozoic intrusive suite that includes dikes and fractures that cut across the metamorphic aureole associated with the Coastal Maine Metamorphic Province (CMM). The diabase dikes are particularly well exposed in the central portion of the State of Maine. The study area encompasses the Penobscot Bay region of northwestern Maine, including the island of Swans Island.

To supplement the existing XRF data, we examined thin sections of diabase dikes to better understand the sequence of events involved in their formation. The diabase dikes are associated with the Penobscot Bay batholith, which is a large, composite intrusives feature composed of a variety of rock types, including granite, diabase, and quartz-feldspar porphyry. The diabase dikes are particularly well exposed in the central portion of the State of Maine.

Petrography

The diabase dikes are characterized by a high abundance of olivine, plagioclase, and pyroxene, which are the primary mineral phases. The diabase dikes are typically medium-grained to coarse-grained rocks, with euhedral crystals of olivine, plagioclase, and pyroxene. The diabase dikes are often zoned, with a core of olivine and plagioclase surrounding a rim of pyroxene.

Previous Studies

Methods

The diabase dikes on Swans Island are Late Silurian in age and are hosted within the Penobscot Bay batholith. The diabase dikes are typically medium-grained to coarse-grained rocks, with euhedral crystals of olivine, plagioclase, and pyroxene. The diabase dikes are often zoned, with a core of olivine and plagioclase surrounding a rim of pyroxene.

Whole-Rock Geochemistry

The diabase dikes on Swans Island are Late Silurian in age and are hosted within the Penobscot Bay batholith. The diabase dikes are typically medium-grained to coarse-grained rocks, with euhedral crystals of olivine, plagioclase, and pyroxene. The diabase dikes are often zoned, with a core of olivine and plagioclase surrounding a rim of pyroxene.

Summary

The majority of the diabase dikes on Swans Island have tholeiitic geochemical affinities, characterized by low incompatible element abundances and is similar to most other diabase dikes on Swans Island. A few dikes have enriched incompatible element abundances, particularly in the Fe-Ti oxide phase.

Dike Orientations

The diabase dikes on Swans Island are Late Silurian in age and are hosted within the Penobscot Bay batholith. The diabase dikes are typically medium-grained to coarse-grained rocks, with euhedral crystals of olivine, plagioclase, and pyroxene. The diabase dikes are often zoned, with a core of olivine and plagioclase surrounding a rim of pyroxene.

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