

**MINERALOGICAL AND PETROLOGICAL  
ASPECTS OF IGNEOUS AND ASSOCIATED  
METAMORPHIC ROCKS OF NORTHWESTERN  
PYETKAYWE BATHOLITH, MYITTHA  
TOWNSHIP, MANDALAY DIVISION**

**PhD DISSERTATION**

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## ABSTRACT

The Pyetkaywe batholith lies at the eastern edge of the Central Lowlands as a prominent topographic feature. It is situated approximately 8 km southeast of Kume, along Yangon–Mandalay highway. A new road from Nay Pyi Daw to Pyin Oo Lwin now under construction is about 1 km north of Pyetkaywe batholith.

This research area comprises the northwestern part of the Pyetkaywe batholith and is covered by dense vegetation except in the northern part. Two peaks, east Pyetkaywe hill (a.k.a. Pyetpyo hill) (1069m) and west Pyetkaywe hill (1031m) are prominent. Integrated geological- geochemical approaches were used for better understanding and to deduce petrogenesis of the rocks exposed and to postulate the origin of pegmatitic gem deposits

Two thirds of the area is covered by the igneous rocks of granitic to ultramafic compositions in which metamorphic rocks of Mogok series, such as hornblende-biotite gneiss, banded biotite gneiss, sillimanite-biotite schist, epidote quartzite, grossularite-tremolite-diopside marble and calc-silicate rocks are found as roof pendants. The exposed igneous rocks are porphyritic hornblende-biotite granite, porphyritic biotite granite, biotite granite, diorite, meladiorite and hornblendite, forming a composite igneous terrane. Meladiorite might have been formed by the magmatic differentiation of the dioritic magma and hornblendite, a segregation product. The tectonic setting of the region indicates that the batholith is a part of the subduction-related magmatic arc that was formed during Late Mesozoic and Early Tertiary.

The recent field evidences, together with petrological and petrochemical analyses, indicated that the granites and diorite of the study area are magmatic in origin, calc-alkaline in nature and are strongly peraluminous. They were emplaced probably in late Early Cretaceous and the depth of emplacement was probably mesozonal (more likely to be transitional between catazone and mesozone). However, the depths varied in places as indicated by the presence of volcanic rocks exposed in the shallower northern part of the batholith. The granites of the area have both I-type and S-type chemical characteristics. However, they are more likely to be S-type because of the presence of tin and tungsten mineralization in the southern part of the study area.

The entire area is structurally rather simple. The general structural trend is approximately ENE-WSW with the dips of 30-55°. The pegmatite, leucogranite and aplite dykes and veins are mostly parallel to the general structural trend, but locally E-W trending pegmatites dykes and veins are also present.

The area is now well known for the commercial production of pegmatitic gems. Beryl (aquamarine, goshenite and yellow beryl), colourless topaz, schorl and quartz (rock crystal and smoky quartz) are found along the streams of east Pyetkaywe Pagoda. Aquamarine from the study area is locally known as Kume beryl which is in demand in the jewellery trade. Recently, granite from the study area is crushed and used as foundation materials for the construction of Nay Pyi Daw - Pyin Oo Lwin car road.