Petrography of Basalt in

Nam Choe Subdistrict, Mae Tha District, Lampang Province

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Abstract

The basalt in the Nam Choe Subdistrict, Mae Tha District, Lampang Province, exhibits slight alteration and/or in-situ weathering. The rocks are predominantly grayish-black and mostly display an indistinct porphyritic texture. Phenocrysts mainly consist of olivine and clinopyroxene, with a minor amount of plagioclase. These phenocrysts occur as both individual crystals and mineral clusters, including plagioclase, olivine, clinopyroxene, plagioclase-olivine, plagioclase-clinopyroxene, and clinopyroxene-olivine. The groundmass is characterized primarily by holocrystalline and lath-shaped (felted) textures, with a very small proportion exhibiting glassy (vitrophyric) texture. The groundmass composition is dominated by plagioclase, with subordinate amounts of clinopyroxene and olivine.

Study area

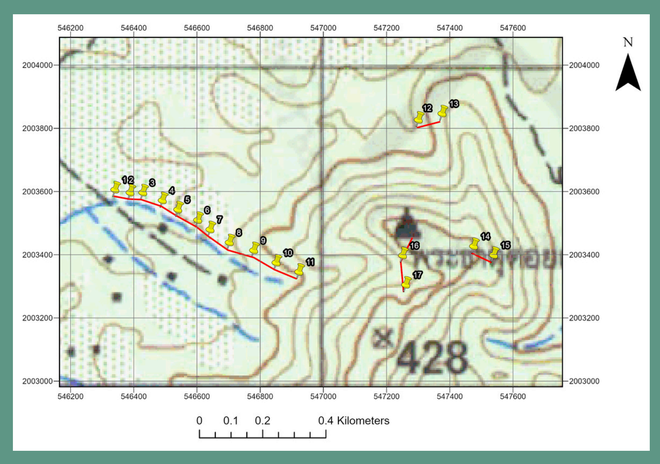


Fig 1. Map showing study area

Objective

1. To study the petrography and mineral composition of basalt in the study area.
2. To determine the crystallization sequence of the rock-forming minerals in basalt within the study area.

Method

1. Field survey and collection of 17 basalt samples.
2. Preparation of thin sections and hand specimens.
3. Analysis of mineral compositions, textures, and alteration products.

Conclusion

The basaltic rocks in Nam Choe Subdistrict, Mae Tha District, Lampang Province, are generally fresh to slightly weathered and exhibit a dark gray color with a distinct porphyritic texture. Petrographic analysis reveals a two-stage cooling process, where large olivine and clinopyroxene phenocrysts formed at depth before the rapid surface crystallization of a holocrystalline, felty plagioclase groundmass. The crystallization sequence began with olivine, followed by clinopyroxene and later plagioclase laths. Additionally, the presence of vesicles and amygdales filled with secondary minerals like calcite and chalcedony indicates post-emplacement alteration and mineralization.

Result

Hand specimen observations show the rock samples as massive basalt with minor vesicular structures. However, petrographic analysis reveals a distinct porphyritic texture, where phenocrysts are predominantly olivine and clinopyroxene, with minor plagioclase. The groundmass is characterized by holocrystalline and felty textures, with very rare volcanic glass. Plagioclase is the primary constituent of the groundmass, followed by minor clinopyroxene and olivine. Some samples show calcite patches infilling vesicles or amygdales. Additionally, secondary minerals from phenocryst alteration, such as serpentine, iddingsite, and chlorite, are observed.

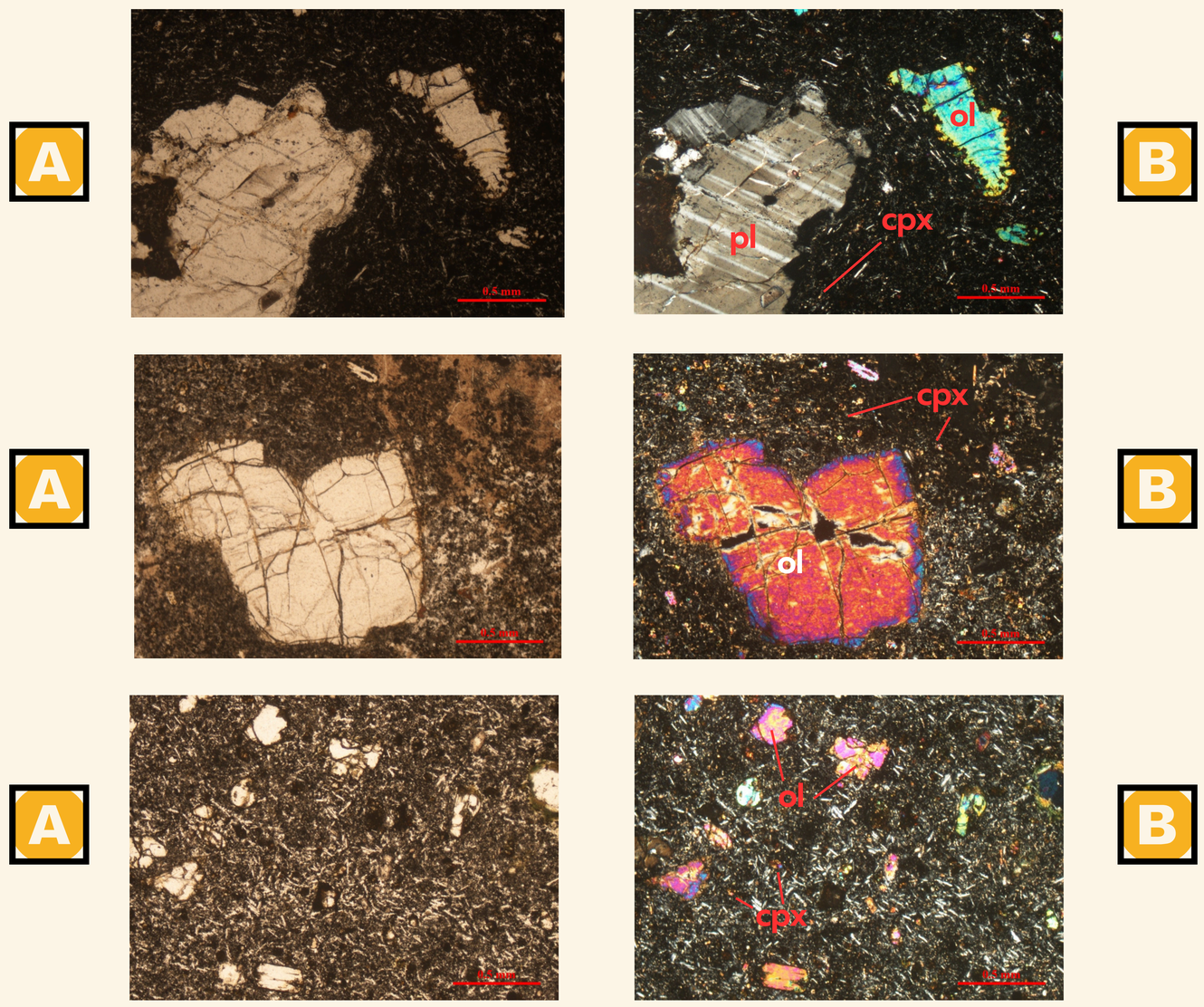


FIG 2. Rock sample under a polarizing microscope.
A) Plane-Polarized Light (PPL) B) Cross-Polarized Light (XPL).

Reference

Department of mineral resources. (2007). Geological map of Lampang Province. Ministry of Natural Resources and Environmen

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