Petrography and mineral chemistry of metasomatized gabbros from the Anarak Ophiolite

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Abstract: The Anarak ophiolite, with E-W trending, located at north of Anarak. In addition to the gabbros in Anarak ophiolite sequence, intrusion of metasomatized gabbros injected into the ophiolite of Anarak in the form of stocks and dykes. Metasomatized gabbros are younger than Anarak ophiolite and older than Anarak metamorphic assemblage and contain diopside, augite, actinolitic hornblende, actinolite, tremolite, phlogopite, albite, oligoclase, pyroxene, penninite, epidote, garnet, sphenite, synchite, calcite and opaque minerals. Penetration of seawater into the lower crust and upper mantle led to high temperature metasomatism in the gabbros. Positive Pb anomaly and negative Ta, Nb and Ti anomalies in whole rock and minerals chemistry of clinopyroxene and amphibole are markers of volcanic tectonic environments and association with subduction zones. Crystallization temperatures of diopside, phlogopite, actinolitic hornblende, actinolite and sphenite are 1150-1200 °C, 750 °C, 600 °C, 450 °C and 360-540 °C respectively.

Keywords: Mineral chemistry; whole rock chemistry; gabbro; metasomatism; ophiolite; Anarak.