Title : Geochemical Variations of Permo-Triassic Magmatic Rocks in Loei Fold Belt, Thailand

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ABSTRACT

This study investigates Permo–Triassic magmatic rocks from the western Loei Sub-belt of Thailand, based on 37 igneous rock samples collected from Loei, Phetchabun, and Lop Buri provinces. Petrographic analysis identifies five main lithological groups comprising two intrusive types (felsic and intermediate–mafic plutonic rocks) and three extrusive types (felsic, intermediate, and mafic volcanic rocks), distinguished by texture, mineral assemblage, and silica content. Geochemically, the rocks are subdivided into several groups according to composition, emplacement, and regional distribution, with ages ranging from Late Permian to Late Triassic. Major- and trace-element variation diagrams indicate that magma evolution was dominated by fractional crystallization, marked by decreasing mafic components and enrichment of incompatible elements. Rock classifications range from gabbro to granite and basalt to rhyolite, with predominantly calc-alkaline affinities and minor high-K calc-alkaline to arc tholeiitic characteristics. Primitive mantle–normalized spider diagrams and REE patterns show enrichment in large-ion lithophile elements, positive Pb anomalies, depletion in Nb–Ta–Ti, and LREE-enriched, flat HREE trends, consistent with subduction-related magmatism. Granitic rocks are mainly I-type, metaluminous to mildly peraluminous, The

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rocks had beed interpreted to evolve from a common mafic source through crystal differentiation in a volcanic arc system. Basaltic rocks are volcanic arc to back-arc signatures, reflecting a transition from mantle-derived melts to magmas modified by subduction processes.

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