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PROCEEDINGS
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Geochemistry and zircon U-Pb geochronology of the Muong Lat granite in the Song Ma suture, Northwestern Vietnam: Implication for petrogenesis and regional geology

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The Muong Lat complex consists of Muong Lat, Sam Son, and Lang Bong intrusions; the Muong Lat intrusion occupies the largest area of the Muong Lat complex, about the $\frac{3}{4}$ area. In this study, we focus on the Muong Lat intrusion. It is located in the south of the Song Ma suture, in Thanh Hoa province. The Muong Lat intrusion has an area of about 300 km², extending an approximately 30 km long and 10 km wide belt. It is mainly characterized by two-mica granite and consists of many phases: Phase 1- coarse- to medium-grained porphyritic gray-white two-mica granite and Phase 2- fine-grained gray-white two-mica granite. The Muong Lat granites intruded quartz-mica-granite schists and microcline gneiss of Nam Co Formation with Proterozoic age. In the west, they intruded the Paleozoic Song Ma Formation, therefore, the Muong Lat granites are younger than late Paleozoic. The Muong Lat granites were exposed in the Song Ma structural zone in NW Vietnam which is considered as a suture between the South China and Indochina blocks that plays an important role in understanding the tectonic evolution in Southeast Asia and surrounding areas. The Muong Lat rocks are sub-alkaline affinity, belonging to high potassic series and exhibiting typical features of S-type granite. They are characterized by high SiO₂, Na₂O+K₂O, and Zr contents and high aluminum saturation index values (0.97 to 1.29 with an average of 1.14). These geochemical signatures, together with high initial ⁸⁷Sr/⁸⁶Sr ratios (0.71391 to 0.74568) and low $\epsilon_{Nd}(t)$ (-13.1 to -9.4) suggest an origin of crustal melting. Primitive mantle normalized trace element patterns exhibit positive anomalies at Rb, Th, U, and Pb, but negative anomalies at high field strength elements (Nb, Ta, and Ti), indicating collision related environment. The depleted Nd and Hf zircon model ages from investigated samples, in combination with inherited zircon ages suggesting the existence of Precambrian basement in the study area.

Keywords: Song Ma suture, Muong Lat granite, zircon U-Pb age, Nd-Hf isotope, geochemistry.



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