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Geochemistry and petrogenesis of the Late Jurassic granitoids from Xuru Tso area, western Lhasa Terrane, Tibetan Plateau

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Although many studies on the granitoids in central and eastern Lhasa Terrane have be carried out, the research on the batholith from western part is still limited. A better understanding of the Late Jurassic granitoids will help us to reveal the magmatic processes and mineralization setting of the Lhasa Terrane during the Late Jurassic. New geochronological data, whole-rock major and trace elements, and zircon Hf isotopic data from the Late Jurassic host granite and dioritic enclaves in the Xuru Tso area were presented in this work. The zircon LA-ICP-MS U-Pb age of the host granite (155.1±0.7Ma) is identical to that of the dioritic enclave (155.7±0.7Ma), implying that they were the products of coeval magmatic events. The host granitic rocks are metaluminous to slightly peraluminous and high K calc-alkaline I-type granites, with enriched LILEs and LREEs, and depleted HFSEs, and negative zircon $\varepsilon_{Hf}(t)$ (-16.6 to -6.6), indicating that they were derived from anatexis of ancient lower crust materials. The dioritic enclaves are metaluminous calc-alkaline rocks, with negative zircon $\varepsilon_{Hf}(t)$ (-8.9 to -3.8) values, suggesting that they were probably generated from an ancient enriched lithospheric mantle source regions. Both host rock and enclaves have wide range $\varepsilon_{Hf}(t)$ values (>5ε units), implies a magma mixing processes. Our new data, together with regional geological background, indicate that the granitoids from Xuru Tso area should have formed by varying extents of mixture between mantle-derived melts and crust-derived silicic melts from ancient basement of the central Lhasa Terrane in response to southward subduction of Bangong- Nujiang Ocean seafloor beneath Lhasa Terrane in Middle-Late Jurassic.