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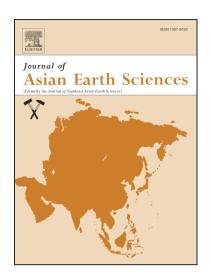
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### CCEPTED MANUSCRIPT

Geochemistry of Early Paleozoic boninites from the Central Qilian block, Northwest China:

Constraints on petrogenesis and back-arc basin development

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#### **Abstract**

Early Paleozoic boninites occur in the Central Qilian orogenic belt, Northwest China. Their petrogenesis provides insights into lithosphere process and tectonic evolution of the Oilian block. In this paper, we carry out a study of geochronological, geochemical and Sr-Nd isotopic compositions for the Early Paleozoic boninites in the Lajishan area of the Central Qilian block. The Lajishan boninites (~483 Ma) have high Al<sub>2</sub>O<sub>3</sub>/TiO<sub>2</sub> (36.7–64.7) and CaO/TiO<sub>2</sub> (31.1-49.6) ratios, and high MgO (7.86-10.47 wt.%), Cr (439-599 ppm) and Ni (104–130 ppm) contents, indicating that the boninites result from a refractory mantle source. They are depleted in high field-strength elements (HFSE) and enriched in large ion lithophile elements (LILE), coupled with slightly high initial <sup>87</sup>Sr/<sup>86</sup>Sr values of 0.7059 to 0.7074 and low  $\varepsilon_{Nd}(t)$  values of -1.05 to +2.66, indicating that the mantle source was metasomatized by subducted slab-derived components. We found that an assemblage of low-Ca group and high-Ca group boninites occurred in the Lajishan belt. The high-Ca group boninites were derived from relatively fertile mantle with slightly higher melting degree, whereas the low-Ca group boninites were generated by partial melting of more refractory mantle wedge

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1

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