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Early Devonian back-arc extension in the eastern Central Asian Orogenic Belt: evidence from a bimodal volcanic sequence from Xilinhot, central Inner Mongolia (North China)

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Abstract

The Early Devonian bimodal volcanic sequence is firstly recognized in the Xilinhot area, central Inner Mongolia (North China). Zircon U-Pb dating of rhyolitic sample gives crystallization age of 407 ± 2 Ma, which is interpreted as the extrusive age of this bimodal volcanic sequence. Basaltic samples belong to tholeiite series whereas rhyolitic samples are peraluminous. Basaltic rocks show typical N-MORB-like REE and trace elemental patterns, with depletion of LREEs and negligible anomalies of Eu (δEu = 0.83-1.00). They have initial $^{87}Sr/^{86}Sr$ ratios ranging from 0.7077 to 0.7086, and positive $\varepsilon Nd(t)$ values from +7.5to +9.0. By contrast, rhyolitic rocks show enrichment in LREEs and LILEs but depletion in HFSEs, with negative Eu anomalies (δEu = 0.58-0.68). They have negative $\varepsilon Nd(t)$