

## Zircon U-Pb chronology and geochemistry of Late Paleozoic-Early Mesozoic intrusive rocks in eastern segment of the northern margin of the North China Craton, NE China and its tectonic implications

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Chronological and geochemical data of Late Paleozoic-Early Mesozoic igneous rocks in the Kaiyuan-Panshi area, NE China, provide insights for the Late Paleozoic-Early Mesozoic tectonic evolution in the eastern segment of the northern margin of the North China Craton (NCC). LA-ICP-MS zircon U-Pb dating results indicate that the Late Paleozoic-Early Mesozoic magmatisms can be subdivided into three stages, i.e., the middle Permian (~270 Ma), the late Permian-early Triassic (259~249 Ma), and the late Triassic (~222 Ma).

The middle Permian magmatisms consist chiefly of garnet-bearing monzogranites. Their SiO<sub>2</sub>-high and Al-rich geochemical feature suggest that they could have formed under a setting of crustal thickening.

The late Permian-early Triassic intrusive rocks are composed mainly of the gabbro, monzodiorite, monzonite, monzogranite, and syenogranite. Chemically, they belong to a calc-alkaline series and are characterized by enrichment in LILEs and depletion in HFSEs and P. Combined with the contemporaneous high-Mg andesites in the adjacent area, we propose that they could have formed under an active continental margin setting.

The late Triassic igneous rocks are composed of pyroxene-peridotites and olivine-pyroxenite with cumulate texture. Combined with the existence of coeval A-type granites and mafic-ultramafic rocks in the adjacent area, it is suggested that they could form under an extensional environment.

Taken together, we propose that the collision and subduction between the continent (NCC) and the island arc could happen in eastern segment of northern margin of the North China Craton from the middle Permian to early Triassic, and that a post-orogenic extension environment occurred in the study area in the late Triassic.

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## Difference of organic matter in the Early Cambrian Ni-Mo-bearing black rock series in the Zunyi city of South China: Implications for the origin of the deposits

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The Ni-Mo polymetallic mineral deposits in the Zunyi city of South China is likely the most representative case of such deposits worldwide, and thus have received large research attentions during recent years. The issue is disputable as the origin of the deposits has been reported to be of sea water or hydrothermal sources. In this work, we mainly reported the difference of organic matter between the metallic and non-metallic intervals, and further addressed the origin of the deposits.

Analytical results from petrography, organic and elemental geochemistry showed that biogenic and organic matters occur widely both in the metallic and in the non-metallic intervals, indicating important effects on the formation of the deposits. The matters vary in abundance, type and maturation between the metallic and non-metallic intervals. For example, the organic matter abundance and maturity of the metallic interval are both the highest in the section. In addition, a special organic matter in elliptical shape was only observed in the metallic interval. The mineral element may be sourced either from sea water or from hydrothermal water. In particular, the sea water and hydrothermal water may be the dominant source for Mo and Ni, respectively. The mineralization of Mo and Ni is relatively early and late, respectively. Based on these results, a new mineralization model was tentatively established.