

The Fe-Cu-Mo-Au polymetallic mineralization system related to intermediate-acidic igneous rocks in the Boluokenu metallogenic belt of the West Tianshan, Xinjiang

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The Boluokenu metallogenic belt of the West Tianshan, Xinjiang, is dominant by skarn-porphyry-hydrothermal vein Fe, Cu, Mo, Pb and Zn mineralization system and epithermal-porphyry Au-polymetallic mineralization system associated with intermediate to acidic rocks, which formed during the southward subduction of the North Tianshan ocean under the Yili plate in the late Paleozoic. The ore-related intrusions and volcanic-subvolcanic rocks were emplaced during late Devonian to early Carboniferous. They typically have geochemical characteristics of subduction-related arc magmatism. Skarn-type Fe-Cu deposits occur at the contact zones between intrusive rocks and Ordovician carbonates. Porphyry-type Cu-Mo deposits occur at the uppermost parts of intrusions and their contact zones with Silurian clastic rocks. Vein-type Pb-Zn-Ag deposits are normally distal to intrusions and hosted by fractured zones in Silurian clastic rocks. The epithermal Au deposits, including Axi (low-sulfidation) and Jinxi-Yiermande (high-sulfidation), and Pb-Zn deposits (e.g., Tabei and Tulasu) are controlled by fracture zones and the stratigraphic horizons with high porosity and permeability in the Dahalajunshan volcanic rocks. The porphyry-type Au mineralization at Tawuerbieke is controlled by faults and fractures in porphyries and associated volcanic rocks and was probably overprinted or telescoped by epithermal Au mineralization. Isotopic geochemistry of S, Pb, C and O indicates that the ore-forming materials were derived from magma, magmatic hydrothermal fluids and/or the host volcanic-subvolcanic rocks. The timing of mineralization is late Devonian to early Carboniferous, roughly coincident with that of the igneous rocks.

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