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## Comparison of Porphyry Copper-molybdenum Mineralization Between Manchuria -Erguna in China and Adjacent Area in Mongolia

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Manchuria-Erguna area is located in the western slope of Greater Hinggan Range, south of Redstone area in Russia, southwest of the Choibalsan in Mongolia. According to the latest metallogenic belt scheme, this area belongs to Erguna metallogenic belt. In the area, a variety of metallic mineral resources such as gold, copper, lead, zinc, silver, molybdenum, uranium, and dozens of deposits have been discovered. There also occur some large deposit, including Wunugetushan copper-molybdenum deposit, Jiawula-Chaganbulagen lead-zinc-silver deposit, E'rentaolegai silver deposit. Genetic types of discovered deposits mainly include porphyry and epithermal-vein type.

Over the past decades, lots of research data have been gathered on tectonic setting, metallogenic conditions, geological and geochemical characteristics of some ore deposits in Manchuria-Erguna area, which indicate that this area has huge metallogenic potential as adjacent areas in Russia and Mongolia. Whereas, whether numbers or sizes of discovered deposits in Manchuria-Erguna area are obviously less than in abroad adjacent areas. Comparisons of the same type deposits in adjacent areas are very significant for both metallogenic theoretical research and geological exploration in Manchuria-Erguna area. Therefore, this paper focuses on comparative studies of representative porphyry copper-molybdenum deposits in Manchuria-Erguna and abroad adjacent areas, so as to provide helpful information for further mineral exploration as well as theoretical studies of ore deposits at home and abroad.

### 1 Comparison of Porphyry copper-molybdenum Deposits in Different Areas

Comparison of several porphyry copper-molybdenum deposits including Wunugetushan in Manchuria,

Badaguan and Taipingchuan in Erguna as well as Erdenet in Mongolia on tectonic settings, ore-controlling geological conditions, mineralization characteristics, ore-forming fluid and metallogenic ages of different deposits demonstrates some geological facts as followings (Jiang et al., 2010; Nie et al., 2004; Li et al., 2007; Qin et al., 1999; Chen et al., 2010; Huang et al., 2010; Li et al., 2011).

(1) The ore-hosting rocks of porphyry copper-molybdenum deposits in Manchuria-Erguna and Mongolia Erdenet are hypabyssal or super hypabyssal intermediate-acid intrusive rocks, for example, quartz diorite-granodiorite porphyry in the Erdenet deposit, monzonite porphyry and rhyolite in Wunugetushan deposit, quartz diorite porphyry and granodiorite porphyry in Badaguan and Taipingchuan deposits.

(2) The porphyry rock bodies and associated copper-molybdenum mineralization are all controlled by secondary faults and fractures of regional deep faults, for example, NW trending faults control the occurrence of Erdenet Selenge porphyry, secondary NW and NEE-trending faults of NE-trending Derbugan faults control the porphyry rock and major ore bodies of Badaguan porphyry, and the Wunugetushan metallogenic porphyry body intruded along NW- and NWW-trending secondary fractures of the Erguna-Hulun regional deep faults.

(3) Orebodies in different deposits are mainly distributed in banding, mostly veins, lenses and branching complex shape, etc.. They are all characterized by veinlet and disseminated mineralization.

(4) Wall-rock alterations in different deposits are similar, and they are featured by apparent zonation. The quartz-sericite alteration zone in all these deposits has close relationship with the copper-molybdenum mineralization.

(5) Medium-high metallogenic temperature, shallow mineralization depth, deep ore-forming materials source

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and similar ore-forming fluids derived from magmatic hydrothermal and mixed with meteoric water, which resulted in the similar metallogenic mechanism of different deposits.

## 2 Difference in Porphyry Copper-molybdenum Deposits

(1) They are located in different tectonic position, Wunugetushan, Taipingchuan, Badaguan porphyry copper-molybdenum deposits in Manchuria-Erguna were located in the south side of Mongolia-Okhotsk Belt, and Erdenet deposit is located in the north side of Mongolia-Okhotsk Belt.

(2) They have different metallogenic age, for example, Erdenet deposit in Mongolia formed in the Early Triassic, Badaguan and Taipingchuan deposit in Erguna region in the Late Triassic, and Wunugetushan deposit in Manchuria region in the Early Jurassic. The difference in mineralization age means that the porphyry copper-molybdenum deposits in different regions formed in different tectonic settings(Jiang et al., 2010; Nie et al., 2004; Li et al., 2007; Qin et al., 1999; Chen et al., 2010; Huang et al., 2010; Li et al., 2011).

In summary, the metallogeny process of the porphyry copper-molybdenum deposits in Manchuria- Erguna in China and adjacent area in Mongolia mainly took place in Early Triassic-Early Jurassic. The fact that they are distributed in both sides of Mongolia-Okhotsk Belt and formed in the similar age maybe indicates that the Mongolia-Okhotsk oceanic crust dived bilaterally beneath the continental crust in the Mesozoic era.

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