

Porphyry Deposits

Porphyry deposits are large-tonnage (>100 Mt) low grade (e.g., < 1% copper and or molybdenum) mineral deposits that host substantial resources of copper (Cu), Molybdenum (Mo), Gold (Au) and Silver (Ag). These deposits consist of large shallow (< 5 km) hydrothermal alteration systems related to porphyry (fine grained) intrusions and can also contain peripheral poly-metallic epithermal and skarn mineralization. Deposits tend to be systematically zoned with respect to base and precious metals are they are typically mined by open-pit with type examples occurring in the southwestern US and Chile.

Mo is typically a by-product of large porphyry Cu deposits (e.g., Erdenet, Mongolia); however, primary Mo deposits occur in the northwestern U.S. and British Columbia, Canada. In general, Mo porphyry's are classified as "Climax Type" or "low-fluorine BC type" based on their chemical signatures.

Mo is a light metal used in the aerospace industry in high-strength steel alloys. Its physical stability and very high melting temperature are key characteristics.

The price of Mo has increased significantly over the past 5 years from under US\$10 a pound to more than US\$40 dollars but has stabilized recently at ca. US\$32 per pound (Fig. 1). This has prompted several mines that were closed in the 1990's to re-open and several new deposits are currently in Feasibility or construction stage. The demand for Mo is increasing as it is becoming a substitute for other metals such as Tungsten in industrial applications.