

Hydrometallurgical recovery of copper from the copper sulphide by-product of Sungei Lembing Tin Mine

SIA HOK KIANG
Sungei Lembing Tin Sdn Bhd

This paper is written to study the amenability of hydrometallurgical recovery of copper from the copper sulphide concentrate, recovered as a flotation by-product from the milling of the Sungei Lembing tin lodes.

The hydrothermal tin lodes of Sungei Lembing are sulphide rich. The sulphide minerals are mainly pyrite, chalcopyrite, some pyrrhotite, sphalerite and arsenopyrite. The sulphide minerals are removed from the tin concentrates by flotation.

The presence of arsenopyrite resulted in a relatively high arsenic content in the copper sulphide concentrate, which rendered it unmarketable. The sulphide by-products were stockpiled.

Prolonged exposure to the atmosphere resulted in the partial oxidation of the copper sulphide concentrates. Hydrometallurgical testwork conducted show that approximately 30% of the copper in the concentrate is readily acid soluble.

Traditionally, the leached copper is recovered by cementation, a method which is relatively cheap and simple. However, the cement copper produced would need further smelting to produce copper plates. By itself, the cement copper powder is not readily marketable.

With the recent advancement of the technology in treating the copper leach solution by SX-EW (solvent extraction - electrowinning), readily salable copper cathode plates can be produced at the mine-site.

The SX-EW method thus represents an attractive, albeit expensive, alternative copper recovery method for small mines far removed from the traditional smelters.
