The Effect of Sodium Chloride on the Leaching of Chalcopyrite in Low Grade Ore

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ABSTRACT

The addition of sodium chloride to sulfuric acid leach liquor containing ferric sulfate has been found to accelerate the dissolution of chalcopyrite $CuFS_2$ in low grade leach ore. Small additions of sodium chloride significantly increase the rate of copper recovery.

Increased conductivity of the leach liquor brought about by the addition of NaCl does not explain the increase in dissolution rate observed. It is postulated the Cl ions form a Fe-Cl complex which is stable enough to carry away the iron from the anodic surface of dissolving chalcopyrite. Chloride ions would be expected to accelerate the dissolution of chalcopyrite when the anodic reaction contributes significantly to the process. Recent work indicates that the rate increase observed by adding NaCl to the leach liquor occurs at temperatures above 50°C. While this rules out the use of sodium chloride for many dump leaching operations, the process remains attractive for the in situ leaching of many deep primary ore bodies.