

INVESTIGATING THE IMPACT OF HIGH TEMPERATURE AGITATION LEACHING ON THE RATE OF OXIME DEGRADATION

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ABSTRACT

Agitation tank leaching is a widely used method in the African Copper Belt to facilitate the rapid dissolution of copper from mid to high grade copper ores. As ore grade has begun to decline and the relative abundance of secondary sulfide mineralization is increasing, many plants are now beginning to treat calcined ore from a roaster to increase the rate of recovery of copper. This process is causing an increase in the temperature of the pregnant leach solution (PLS) produced.

The extraction step occurs in relatively mild acid conditions of 1-10g/L sulfuric acid, which is significantly lower than the 150-200g/L sulfuric acid level that copper solvent extraction (SX) reagents are contacted with in the stripping stage of most processes. However, the higher temperature range of 40-60°C is thought to be linked to an observable increase in the acid-catalyzed hydrolysis rate of the oxime reagents commonly used to selectively extract the copper from the PLS after agitation leaching.

This study shows the results of an experiment conducted to investigate the rate of hydrolysis observed from sustained contact with the PLS produced from these leaching conditions and temperatures. The results will be contrasted for the most common types of extractants currently used in the market and discuss the potential implications of those results.

Keywords: Copper SX, Oxime reagents, Hydrolysis, Agitation Leaching, Calcined ore, Degradation,