

# Effect of Cyanide and Oxygen Concentrations on Leaching Jarosite-Bearing Bio-oxidised Flotation Gold Concentrates

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## ABSTRACT

Biological oxidation is a pre-treatment technique used to liberate gold from refractory auriferous sulphide minerals such as arsenopyrite and pyrite. During this pre-treatment process, secondary sulphate minerals (e.g., jarosite) may be formed which could render the liberated gold refractory and unavailable for leaching, and also attenuate the oxidation process. Our previous studies have shown that, the presence of secondary sulphate minerals, particularly jarosite encapsulation, led to poor gold extraction from the bio-oxidised concentrates obtained from the Ghanaian gold province. In this paper, therefore, we investigate the influence of cyanide and oxygen concentrations on the gold leaching efficacy of the jarosite-bearing bio-oxidised flotation gold concentrates. From the results, it was evident that increasing cyanide concentration from 1 kg/t to 5 kg/t led to about two times higher gold extraction (29 wt.% to 71 wt.%). Mineralogical studies of the leached feeds and solid residues using semi-quantitative X-ray diffraction in tandem with scanning electron microscope equipped with BSE and EDX detectors showed reduction in the jarosite content as higher cyanide concentrations were deployed for the leaching process. Corresponding influence of oxygen coupled with changes in the pulp chemistry and overall reagent consumption are shown and discussed.