

Effect of adaptation of acidithiobacillus ferrooxidans on ferrous oxidation and nickel leaching efficiency

Abstract

Studies were carried out on ferrous oxidation and bacterial leaching of copper flotation concentrate to selectively leach nickel by two strains of *Acidithiobacillus ferrooxidans*. However, slower growth rates of these strains have led to prolonged lag periods during leaching process with low nickel recovery. Hence, attempts were made to adapt these strains to high concentrations of copper salt, nickel salt, mixture of copper and nickel salts and flotation concentrate which would facilitate the preferential leaching of Ni containing pentlandite phase from a floatation concentrate with chalcopyrite phase in predominance. When unadapted strains of Tf were replaced with adapted strains, the lag period during leaching process was drastically declined with immediate resurgence of pH fall indicating biologically produced acid. Cells adapted to metals and concentrate has shown positive effect on oxidizing ability of pyrite and nickel leaching efficiency. Unadapted Tf-44 and Tf-231 strains have shown selective leaching of nickel (55% and 49.7%) while the leachabilities obtained with adapted strains were 80% and 83.5% respectively.