

Effect of Substrate Concentration and Pulp Density on Bioleaching of Metals from as Received Spent Refinery Catalyst

Authors : Haragobinda Srichandan, Ashish Pathak, Dong Jin Kim, Seoung-Won Lee

Abstract : The present investigation deals with bioleaching of spent refinery catalyst (as received) using At. thiooxidans. The effect of substrate concentration and pulp density was studied. XPS analysis concluded that the metals in spent catalyst were present as both sulfide and oxides. The dissolution behavior of metals during bioleaching was different. During bioleaching, higher dissolution of Ni and lower dissolution of Mo, V and Al was observed. An increase in pulp density from 1% to 10% led to a decrease in leaching yields of all the metals. This was due to the substantial increase in medium pH at higher pulp densities. The maximum negative impact of pulp density was observed on the leaching yield of V. An increase in sulfur concentration from 0.5% to 2.5% didn't bring positive impact on metal leaching yield. 0.5% sulfur was found to be the optimum above which no significant increase in leaching yields of metals was observed.

Keywords : At. thiooxidans, pulp density, spent catalyst, bioleaching

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