

Comparison of Bioleaching of Metals from Spent Petroleum Catalyst Using Acidithiobacillus Ferrooxidans and Acidithiobacillus Thiooxidans

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Abstract : The present investigation deals with bioleaching of spent petroleum catalyst using *At. ferrooxidans* and *At. thiooxidans*. The spent catalyst used in the present study was pretreated with acetone to remove the oily hydrocarbons. FESEM and XPS analysis indicated the presence of metals in sulfide and oxide forms in spent catalyst. Both *At. ferrooxidans* and *At. thiooxidans* were found to be highly effective in producing the acid. Bioleaching with *At. ferrooxidans* and *At. thiooxidans* led to higher recovery of metals compare to control. During bioleaching similar recoveries of metals were obtained using *At. ferrooxidans* and *At. thiooxidans*. This might be due to the presence of metals as soluble oxides and sulphides in the spent catalyst. At the end of bioleaching, about 87-90% Ni, 34% Al, 65-73% Mo and 92-97% V were leached using above bacteria. It is elucidated that bioleaching with *At. thiooxidans* is comparatively more advantageous due to lower cost of sulphur.

Keywords : *At. ferrooxidans*, bioleaching, metal recovery, spent catalyst

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