عنوان مقاله:

Study of Ni ion biosorption process from the mineral wastewaters using Aspergillus. niger on the alginate bed with the fixed bed reactor performance

محل انتشار:

اولین کنفرانس بین المللی منابع آب با رویکرد منطقه ای (سال: 1388)

تعداد صفحات اصل مقاله: 7

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خلاصه مقاله:

Ni containing wastewaters are among the most important sources which transfer heavy metal contaminants to the environment; therefore mixing the Ni containing wastewater with human wastewater especially in high concentrations is an unmethodical action. Biological methods, particularly biosorption, are of high desirability with respect to economics and performance compared to physical-chemical methods (ion exchange, reverse osmosis…).In the present work, real wastewater sample from one of the industrial units was studied and the biosorption of Ni ion was performed through Aspergillus.niger microorganism dead bulk with batch and fixed bed process.First the absorption process was studied under floating flask (batch) condition and in the pH range of 6-9 and concentrations between 0.5-1.5 g/100mole, and then pH parameter and gram of absorbent were optimized to 8 and 1, respectively. The absorption rate obtained from this process is equal to 60% the results were adjusted to Longmuir and Frendlish absorption models and it was found that the results follow Longmuir absorption model. Then the Ni containing wastewater was studied in the fixed bed process. In this study in order to easy usage, fungous biomass powder was stabilized in the polymeric matrix and converted into granules. pH of wastewater is equal to the optimized pH obtained from the batch process. Use of fixed bed reactor is very convenient for the experiments and it works with stream like flow. The amount of volume occupied by granules is 147.2 ml and amount of biomass is about 16 g.The rate of absorption resulted from the fixed bed process is equal to 75.19% with inlet velocity of 4 ml/min , and this value is approximately two times greater than the amount of absorption obtained from batch process. Then the results were studied and adjusted Yun absorption model. Based on the resulted plot model, the breakthrough of the plot is at 60 .min

کلمات کلیدی:

Mineral processing, Biosorption, Fixed bed reactor, Yun model, Aspergillus Niger