

عنوان مقاله:

Comparison of three culture media for one-step and two-step bioleaching of nickel and cadmium from spent Ni-Cd batteries by *Aspergillus niger*

محل انتشار:

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خلاصه مقاله:

Among the biological processes, bioleaching is the most widely employed method for metal extraction from electronic waste (e-waste). The purpose of this research was to evaluate the ability of one-step and two-step bioleaching under different culture media for nickel (Ni) and cadmium (Cd) removed from spent Ni-Cd batteries by the fungus *Aspergillus niger*. In this result, the concentrations of Ni and Cd in battery scraps from e-waste recycling shops were respectively 578.13 ± 7.02 mg Ni g⁻¹ and 128.35 ± 11.42 mg Cd g⁻¹. During the bioleaching process, both heavy metal removals were higher in Richards's Broth (RB) followed by the Potato Dextrose Broth (PDB) and Malt Extract Broth (MEB), respectively. The maximum citric acid production (96.99 ± 3.05 mM) and lower pH values were obtained in the RB medium. The bioleaching experiment showed that the recovery for the two-step leaching method was higher than the one-step bioleaching method. Following an incubation period of 21 days between the spent Ni-Cd batteries and RB medium, the two-step bioleaching experiment suggested that the citric acid products of *A. niger* were the best leaching agent for Ni and Cd bioleaching.

کلمات کلیدی:

Nickel, Cadmium, Bioleaching, *Aspergillus niger*, Ni-Cd battery

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