

Removal of Cr and Mn from wastewater using food wastes as low-cost biosorbents

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Abstract

This study investigated the ability of three common food wastes (eggshell, potato peel, and tea waste) as low cost and environmentally friendly bio sorbent for Chromium (Cr) and manganese (Mn). The effect of three parameters (wastewater pH biosorbent dose, and contact time on removal of heavy metal (HM) removal efficiency were studied, where heavy metal removal increased as each of these three parameters increased. Of the three wastes studied, tea waste was the most efficient biosorbent, with potato peel waste being less active in adsorption than tea waste, and eggshell having the least ability to adsorb HMs. Irrespective of the waste used Cr was adsorbed in higher amounts than Mn. The adsorption data were fit to both the Langmuir and Freundlich adsorption isotherms the data best fit the Langmuir model when tea waste adsorbed Cr and the results fits more suitable under freundlich when egg shell absorbed Mn