

Comparative Kinetic Study for Adsorption of Heavy Metals with Low-Cost Adsorbents—Sugarcane Baggase and Eggshell

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Publisher: Springer International Publishing

Published in: Techno-Societal 2020

Abstract

Heavy metals present in wastewater are toxic and have an adverse effect not only on human health but the whole ecosystem. The removal of toxic heavy metals from wastewater is of great concern from the environmental point of view. Here, sugarcane bagasse is used as an adsorbent for the removal of heavy metals along with eggshell. The experimentation was carried out using the conventional batch process as well as with ultrasonication. The ultrasonication creates cavitation which results in breaking of bond and creating more area for adsorption. Various process parameters such as contact time, pH, particle size, etc. were investigated, optimized and studied to get maximum adsorption. It was found that Ultrasonication shows maximum %removal of Zinc than the batch process. Effects of %removal of zinc concerning time, uptake capacity concerning time were plotted. The isotherms were plotted for kinetic study shows that the Langmuir isotherm is best suitable.

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