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Original Research Article

Kinetic Study of the Adsorption of Zinc and Copper Ions on to Activated Carbon Prepared from Date Pits

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ABSTRACT

In the present work, an activated carbon material has been prepared from date pits to remove zinc (Zn^{2+}) and copper (Cu^{2+}) from a wastewater. The effect of some parameters on adsorption performance has been investigated. The optimization of operational conditions allowed increasing the adsorption of Zn^{2+} ions from 33% to 85% and the adsorption of Cu^{2+} from 23% to 70%. The optimum conditions found are a mass of adsorbent of 4g, a stirring speed of 500 rpm and a ratio of 15 for volume of liquid / mass of solid. It has been shown that the adsorbent has more affinity to the copper ions than zinc ions and the modeling results gave adsorption isotherms type "C". The results also showed that the kinetics of zinc and copper ions adsorption were described by a pseudo second-order rate model and controlled by the internal diffusion which can be considered as limiting step that controls the rate transfer of these ions to the solid surface.

Keywords: Activation, Adsorption, Modeling, Date pits, Heavy metals, Kinetics