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Adsorption of Pb(II) onto Modified Rice Bran

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Author(s)

Hengpeng Ye, Zhijuan Yu

ABSTRACT

In this study, the modified rice bran was tested to remove Pb(II) from water. Batch experiments were carried out to evaluate the adsorption characteristics of the modified rice bran for Pb(II) removal from aqueous solutions. The adsorption isotherms, thermodynamic parameters, kinetics, pH effect, and desorbability were examined. The results show that the maximum adsorption capacity of the modified rice bran was approximately 70.8 mg Pb(II)/g adsorbent at temperature of 25°C and at the initial Pb(II) concentration of 400 mg/L and pH 7.0. And the adsorption isotherm data could be well fitted by both Langmuir equation and Freundlich equation. Thermodynamic studies confirmed that the process was spontaneous and endothermic. The adsorbed amounts of Pb(II) tend to increase with the increase of pH. The adsorption kinetic data can be satisfactorily described by either of the power functions and simple Elovich equations. The desorbability of Pb(II) is about 15-20%, and it is relatively difficult for the adsorbed Pb(II) to be desorbed. The relatively low cost and high capabilities of the rice bran make it potentially attractive adsorbent for the removal of Pb(II) from wastewater.

KEYWORDS

Rice Bran, Pb(II) Removal, Adsorption Capacity, Adsorption Isotherm

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