

عنوان مقاله:

Adsorptive removal of acid blue 15 dye (AB15) from aqueous solutions by red mud: characteristics, isotherm and kinetic studies

محل انتشار:

مجله علمی علوم محیط زیست, دوره 4, شماره 5 (سال: 1394)

تعداد صفحات اصل مقاله: 11

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خلاصه مقاله:

The dyes are one of the main environmental pollutants in various industrial wastewaters. In the present study, the adsorption potential of Red mud in a batch system for the removal of Acid blue 15 dye from aqueous solutions was investigated. Batch kinetics and isotherm studies were carried out to evaluate the effect of contact time (10-150 min), initial pH of solution (3-11), initial phenol concentration (25-200 mg L⁻¹) and adsorbent dose (0.5-8 g L⁻¹) on sorption efficiency. Adsorption capacities (q_e) increased with increasing of initial dye concentration and decreased with increasing adsorbent dose and pH. Maximum adsorption capacity of the red mud was 29.44 mg g⁻¹ when 73.6% of the AB15 dye was removed. The adsorption equilibriums were analyzed by Langmuir, Freundlich, Temkin and BET isotherm models. It was found that the data fitted to Langmuir ($R^2=0.997$) better than isotherm other models. Batch kinetic experiments showed that the adsorption followed pseudo-second-order kinetic model with correlation coefficients greater than 0.995. According to achieved results, it was defined that Red mud not only was an inexpensive absorbent, but also a quite effective factor in removal of Dyes from water and wastewater.

کلمات کلیدی:

Adsorption , Aqueous solution , Red mud , Acid blue 15 dye

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