

REMOVAL OF REACTIVE BLUE 7 DYE FROM AQUEOUS SOLUTION USING SOLID WASTE

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ABSTRACT

Cement kiln dust (CKD) is a waste residue composed of oxidized generated as a by-product of the manufacture of Portland cement. In this study the CKD was used as an unconventional and low-cost adsorbent for the reactive blue 7 dye. The effect of adsorbent dose, contact time and initial dye concentration on removal efficiency of dye were investigated. Equilibrium adsorption isotherms and kinetics were studied. Besides, the dye-loaded CKD was investigated with XRD and FT-IR techniques. The results were shown the removal efficiency increases as CKD dose increase and contact time. The adsorption isotherm data were correspondent well to the Langmuir isotherm and the monolayer adsorption capacity was found to be 100 mg/g at 25 °C. This study showed that CKD has the potential to be used as a low-cost adsorbent. The investigations of dye-loaded CKD were shown the dye molecule reacted with soluble fraction on CKD dust to form insoluble salt.

KEYWORDS: Cement Kiln Dust, Reactive Blue 7, Isotherm, Kinetic, XRD, FTIR