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Investigation on adsorption of dye (Reactive Red 35) on Egg shell powder

A.Babuponnusami[1]*,S.Velmurugan[2]

[1]Department of Chemical Engineering, VIT University, Vellore, Tamilnadu,India.
[2]Department of Chemical Engineering, Adhiparasakthi Engineering College, Melmaruvathur,India.

Abstract: Inexpensive and eco-friendly biosorbent Egg Shell Powder (ESP) has been successfully utilized for the removal of dye from aqueous solution. ReactiveRed 35(RR 35)was used as model dye. The effects ofinitial dye concentration, adsorbent dose, adsorbent size and pH on adsorption capacity were investigated. The results indicate that the adsorption process is highly pH –dependant and the optimum pH for dye removal are3. The percentage removal of dye is inversely proportional to increase in initial dye concentration and directly proportional to adsorbent dosage. Smaller adsorbent particles add to increase the percentage removal of dye. The equilibrium data fitted well with the Langmuir model (R^2= 0.995) and adsorption kinetics followed the pseudo-second order equation (R^2= 0.99). The maximum adsorption capacity of RR 35 was calculated from Langmuir isotherm model and found to be 41.85 mg g^{-1}.From these results ESP can be employed as a low cost alternative adsorbent compared to other commercial adsorbents on the removal of dyes from wastewater.
Keywords: Adsorption,Reactive red 35,Dye,Egg Shell Powder, Adsorption Isotherm.

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