Removal of Basic Blue 3 and Reactive Orange 16 by adsorption onto quartenized sugar cane bagasse

Abstract

The effectiveness of using sugar cane bagasse, an agricultural by-product, as a sorbent to remove basic and reactive dyes from aqueous solution was studied. The quartenized sugar cane bagasse (QSB) is capable in removing both Basic Blue 3(BB3) and Reactive Orange 16 (RO16). The sorption of dye solutions was strongly affected by pH, where the optimum pH is 6-8. The kinetics of the dye sorption processes fitted a pseudo-second order kinetic model. Results indicated that the adsorption isotherms fitted well into both the Langmuir and Freundlich isotherms. The removal of BB3 was favourable at higher temperature, indicating that the sorption process was endothermic. On the other hand, sorption of RO16 on QSB was more favourable at low temperature.

Keyword: Sugar cane bagasse; Quartenization; Sorption; Reactive dyes; Basic dyes