

ADSORPTIVE REMOVAL OF CONGO RED (CR) USING THERMALLY TREATED BRICK CLAY PARTICLES

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Textile dyes, among many waste materials of manufacturing processes, shows significant effect on water pollution. Many dyes are toxic in nature with suspected carcinogenic and mutagenic effects that affect aquatic biota and human. Congo red (CR) is a benzidine based anionic disazo dye. This dye is known to metabolize to benzidine, a known human carcinogen.

Among various adsorbents, natural availability, low cost, and high potential of sorption are increasing the commercial value of brick clay particles. This investigation was deal with the brick clay particles as the adsorbent for the removal of CR from aqueous solution. Batch studies were conducted to evaluate the adsorption capacity of brick clay particles and the effect of amount of brick clay, stirring time, settling time temperature of firing and initial concentration on it.

The results of the experiment showed that from 7.0 mg dm^{-3} CR of 50.0 cm^3 , the adsorption of CR was optimum with 5.0 g of brick clay. Variation of stirring time and settling time on the extent of adsorption reveals that 10 min stirring and 2 h settling would be optimum. Among various firing temperatures, brick clay fired at the temperature range of $300 \text{ }^\circ\text{C} - 500 \text{ }^\circ\text{C}$ provide the optimum sorption of CR. It is expected that this temperature would not combusted organic matters, hence organic matters also provides sites for adsorption.

Both Langmuir and Freundlich models were satisfied with the results of concentration dependent studies obtained. Satisfactory of both Langmuir and Freundlich models, reveals that CR-brick clay system obeyed initial monolayer adsorption and further multilayer adsorption.