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FORMULATION OF COMPOSITE BEADS ALGINATE/HYDROXIDE SLUDGE FOR THE REMOVAL OF DYES FROM AQUEOUS SOLUTIONS

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Abstract

To produce drinking water, the water treatment plants generate huge quantities of sludge, this sludge is a waste and they are evacuated to the dump. The valuation of these sludge will be benific This study focuses on the development of composite alginates beads and sludge activated chemically by sulphuric acid and thermally for the removal of dyes from aqueous solutions. Two dyes were studied; a basic cationic dye (methylene blue) and an acidic anionic dye (Congo red) to compare the adsorption mechanisms of the two dyes. This study proposes a combination of the adsorbent potency of alginates and water treatment sludge. The alginates /sludge ratio was studied to determine the best formulation. Subsequently the effect of the crosslinking agent, drying, thermal and chemical activation, contact time, mass of the composite beads and the effect of pH on the yield discoloration was studied. The results of adsorption kinetics of MB (methylene blue) and CR (Congo red) are better described by the pseudo second-order model. The adsorption isotherms of the two dyes are satisfactorily described by the Langmuir model. Activation of the sludge makes it possible to improve the adsorbent capacity of the beads.

Key words: activation, bead, drinking water, dye, sludge

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