Etude de l'élimination des colorants en solution sur un charbon actif issu du broyage cryogénique des pneus usagés

OULD BRAHIM Insaf

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Abstract : The synthesis of an activated carbon by chemical activation with phosphoric acid from powder from the cryogenic grinding of a used tire confirmed by infrared analysis the introduction of surface functions, SEM analysis mesoporous nature of coal active prepared which has a specific surface area of 356 m² / g. The experimental approach is to conduct in aqueous solutions, adsorption experiments in batch system of two cationic dyes: Methylene blue and Methyl green is widely used in the textile industry of Algeria. For this, we conducted an experimental study of adsorption kinetics by examining the effect of some important operating parameters affecting the decolorizing power of charcoal used, in particular, the contact time, pH of the solution, the temperature , the initial concentration of dye and the mass of activated carbon. The study of the influence of contact time showed an equilibrium time of 114 min for MB and 80 minutes for the VM. The application of classical models of adsorption isotherms indicates a good description of experimental results by the Langmuir model for both dyes with maximum capacities of 28.87 mg / g for MB and 33.33 mg / g for the VM . Through the kinetic study conducted, it turned out that in the process of adsorption of two dyes on activated carbon prepared, several mass transfer mechanisms involved, namely the external mass transfer, surface reactions that are pseudo-first order for both systems, and internal diffusion. The study of the influence of temperature was used to estimate the thermodynamic quantities which have shown that the adsorption is spontaneous, exothermic and endothermic for MB for the VM

Keywords : adsorption, activated carbon, Langmuir, Freundlich