Elimination of a Basic Textile Dye by Adsorption on Natural Modénit

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Abstract:

The objective of this work is to reduce the environmental impact of a basic textile dye using a mordenite ore (zeolite) previously characterized. A series of tests was performed to demonstrate the influence of some parameters on the adsorption capacity of the natural mordenite. such that the contact time, the mass of the adsorbent, the pH and stirring speed Analysis of the X-ray diffraction ore showed a very strong peak of the mordenite followed by some low peak intensity relative the quartz, sanidine, muscovite and albite.Textual analysis by BET was used to determine the BET surface area (m^2/ g) = 21.78, the outer surface (m^2/g) = 12.85557 and conclude that the natural mordenite has pores slit, a mesoporous material which has both mesopores and micropores. The overall results show that the adsorption of red azucryl on natural mordenite is favorable, the equilibrium time is reached between 10 and 15 min, The amount adsorbed at equilibrium increases with increasing pH, it reaches the maximum at pH = 11, the variation in the stirring speed promotes the adsorption, this latter is maximum at 300 tr/min. The experimental results were analyzed by the Langmuir model, Freundlich and Elovich. adsorption of red azucryl on natural mordenite is best described by the Freundlich model with a correlation coefficient of 0.999. The thermodynamic study found that the adsorption process is spontaneous, endothermic ($\Delta Ho > 0$), the standard enthalpy of adsorption reaction (6.83 kJ / mol is less than 40kJ / mol) shows that the adsorption is physical type

Keywords:

Adsorption, basic textile dye, natural modénite.