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A comperative study for adsorption of methylene blue from aqueous solutions by two kinds of amberlite resin materials

Özge Kerkez*, Şahika Sena Bayazit, Hasan Uslu

Engineering and Architecture Faculty, Chemical Engineering Department, Beykent University, Ayazağa, İstanbul, Turkey
Tel. +90 212 444 19 97 / 5294; email: ozgekerkez@beykent.edu.tr

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ABSTRACT

An organic dye, methylene blue (MB), was separated from a model aqueous solution by using adsorption method with low cost resin adsorbents. The adsorption of MB was studied with Amberlite XAD-16 and Amberlite XAD-7 HP. The aim of the study is to achieve a high removal value of the dye and comparing these two adsorbents for MB adsorption. Adsorption of MB was investigated in terms of equilibrium and kinetics conditions. Adsorption isotherms were determined and correlated with equations such as Freundlich, Langmuir and Temkin isotherm models. Langmuir isotherm has good agreement with R^2 value over 0.99. Pseudo second order model was fitted for this adsorption system. Here we showed that 99% removal of MB can be achieved with Amberlite XAD-16. SEM studies revealed the morphological observations of the unloaded adsorbent and the changes in the adsorbed polymeric resin. FTIR spectrums of adsorbents before and after the adsorption supported the SEM results.

Keywords: Methylene blue adsorption; Amberlite XAD-16; Amberlite XAD-7 HP; Freundlich; Langmuir; Temkin

*Corresponding author.