

Batch Adsorption Studies for the Removal of Textile Dyes from Aqueous Solution on Three Different Pine Bark

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Abstract : The main objective of the present study is the valorization of natural raw materials of plant origin for the treatment of textile industry wastewater. Selected bark was: maritime (MP), pinyon (PP) and Aleppo pine (AP) bark. The efficiency of these barks were tested for the removal of three dye; rhodamine B (RhB), Green Malachite (GM) and X Methyl Orange (MO). At the first time we focus to study the different parameters which can influence the adsorption processes such as: nature of the adsorbents, nature of the pollutants (dyes) and the effect of pH. Obtained results reveals that the speed adsorption is strongly influencing by the pH medium and the comparative study show that adsorption is favorable in the acidic medium with amount adsorbed of (Q=40mg/g) for rhodamine B and (Q=46mg/g) for orange methyl. Results of adsorption kinetics reveals that the molecules of GM are adsorbed better (Q=48mg/g) than the molecules of RhB (Q=46mg/g) and methyl orange (Q=18mg/g), with equilibrium time of 6 hours. The results of adsorption isotherms show clearly that the maritime pine bark is the most effective adsorbents with adsorbed amount of (QRhB=200mg/g) and (QMO=88mg/g) followed by pinyon pine (PP) with (QRhB=184mg/g) and (QMO=56mg/g) and finally Aleppo pine (AP) bark with (QRhB=131mg/g) and (QMO= 46mg/g). The different obtained isotherms were modeled using the Langmuir and Freundlich models and according to the adjustment coefficient values R², the obtained isotherms are well represented by Freundlich model.

Keywords : maritime pine bark (MP), pinyon pine bark (PP), Aleppo pine (AP) bark, adsorption, dyes

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