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Adsorption of Crystal Violet onto PVA-Carrageenan/MMt Nanocomposite

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Currently, wastewater treatment due to loss of water resources, increasing waste and other hazardous materials has become a serious problem. The ultimate goal of environmental protection, the wastewater treatment by methods appropriate to the health of humans, animals and the environment has been evaluated. Different methods have been used for industrial wastewater treatment. Recently, due to the complexity of these industries and economical purpose, the adsorption method with low cost and ease of utilization has been studied. Introduction of new technologies to increase the availability of clean water is almost fifty years ago. Nanofiltration membranes were developed during the 1970s and 1980s. In the membrane process, using different types of membranes for drinking water production from seawater, brackish and saline water, wastewater, surface water and groundwater has expanded rapidly.The interaction of mineral powders with reactive site of natural polymers and monomers result in a superabsorbent composite. Superabsorbent composites based on synthetic polymers or natural polymers have been reported.
In this paper, we investigated the synthesis of nanocomposites based on poly (vinyl alcohol) in the presence of montmorillonite powder using carrageenan. The nanocomposite structure was confirmed using FTIR spectroscopy and the morphology of the samples was examined by scanning electron microscopy (SEM). The influence of the parameters, which can be altered gelation time as a parameter for assessing the optimal level of the resultant nanocomposites was investigated in details. The resulting nanocomposite was examined to remove cationic crystal violet dye from water. It was revealed that the by inclusion of montmorillonite nanoclay, the dye adsorption content of nanocomposite hydrogel (NH) was similar as clay-free hydrogel (H). But the rate of dye adsorption was increased.

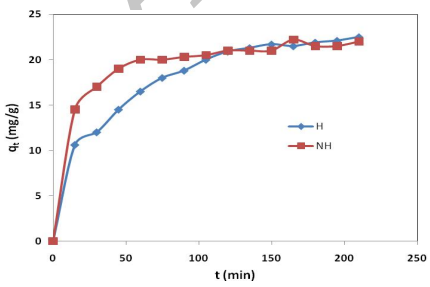

Figure 1 Effect of contact time on the dye adsorption of hydrogel and nanocomposite hydrogel (adsorbent dose: 50 mg; volume of dye solution: 50 mL; Dye concentration: 25 mg/L).

References:
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