

O 9. THE USAGE OF ACRYLAMIDE BASED HYDROGELS REINFORCED WITH POTASSIUM HUMATE FOR REMOVAL OF METHYLENE BLUE FROM AQUEOUS SOLUTIONS

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ABSTRACT: Developments in technology related with population growth cause a pollution resulted from discharging of waste water into the environment without any treatment. Waste water generated by different industries such as pharmaceutical, dye, textile and so on damages the environment. Aromatic and azo groups in dyes pose a danger due to their toxicity in water. Methylene blue is one of the most common used dyes which is toxic, resistant to breakdown with time, risk to human health and aquatic life. Adsorption process is generally preferred due to effective and low-cost method. Recently, different types of hydrogels have been applied as an adsorbent for removal of dyes in addition to clays, carbon based materials and natural compounds. In this study, the methylene blue adsorption performance of hydrogels which are three-dimensional networks of crosslinked hydrophilic materials with high absorption capacity of water was investigated.

In the synthesis of hydrogels, acrylamide and N-vinyl-2-pyrrolidone, N,N'-methylenebisacrylamide, potassium humate, ammonium persulfate and N,N,N',N'-tetra-methylethylenediamine were used as monomers, crosslinker, filler, initiator and accelerator, respectively. The structural and morphological characterization of the hydrogels was carried out by FTIR and SEM analyses. And also, swelling behavior of the hydrogels was determined. With the addition of potassium humate to the hydrogel that showed the highest swelling capacity, the swelling capacity increased up to maximum value as 1727%. In the last stage, the hydrogel including potassium humate was used as adsorbent for methylene blue adsorption studies.

Keywords: Hydrogel, Acrylamide, N-vinyl-2-pyrrolidone, Potassium humate, Methylene blue