ABSTRACT

M.Sc. Thesis

PREPARATION, CHARACTERIZATION AND INVESTIGATION OF ADSORPTION PROPERTIES OF CHEMICALLY CROSSLINKED ACRYLAMIDE/CITRACONIC ACID/SODIUM ACRYLATE TERPOLYMERS

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In this study, it was aimed that synthesis of chemically crosslinked terpolymers by using acrylamide as monomers with citraconic acid and sodium acrylate, characterization and the investigation of adsorption properties of synthesized polymers. Chemically crosslinked acrylamide/citraconic acid/sodium acrylate and acrylamide/sodium acrylate/citraconic acid polymers were prepared by free radical polymerization in aqueous solution using ethylene glycol dimethacrylate and 1,4-butanediol dimethacrylate as crosslinkers. Ammonium persulphate as initiator and *N,N,N′,N′*-tetramethylethylenediamine as accelerator were used in the reaction.

Structural characterization of chemically crosslinked polymers was made with Fourier Transform Infrared Spectroscopy (FT-IR) analysis. Dynamic swelling tests were applied to chemically crosslinked acrylamide/citraconic acid/sodium acrylate and acrylamide/sodium acrylate/citraconic acid polymers at 25^{o}C for swelling characterization. Parameters about swelling kinetics and diffusion mechanism were calculated by using of the results of swelling studies.

Basic Blue 12 (BB 12) and uranium acetate (for uranyl ions) were selected as model molecules to investigate adsorption properties of chemically crosslinked

acrylamide/citraconic acid/sodium acrylate and acrylamide/sodium acrylate/citraconic acid polymers. Adsorption properties were investigated by interacting of chemically crosslinked acrylamide/ citraconic acid/sodium acrylate and acrylamide/sodium acrylate/citraconic acid polymers samples with BB 12 and uranium acetate (for uranyl ions) until equilibrium at 25^{o}C. At the end of the experiments 21,70-78,91 % BB 12, and 18,46-40,72 % uranyl ions adsorptions were determined.

KEY WORDS: acrylamide/citraconic acid/sodium acrylate, acrylamide/sodium acrylate/citraconic acid, crosslinking, hydrogel, citraconic acid, sodium acrylate, swelling, adsorption.