

## ABSTRACT

### PREPARATION, CHARACTERIZATION AND INVESTIGATION OF POTENTIAL SORPTION CAPABILITIES of NEW POLYMER/CLAY COMPOSITE HYDROGELS ALLOYED CARRAGEENAN

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In this study, acrylamide monomer and sodium methacrylate as a comonomer and in order to form a semi-IPN and composite structure with carrageenan as a naturel polymer and montmorillonite as a clay mineral have been synthesized for the production of chemically crosslinked copolymers. Hydrogel systems were prepared by free radical polymerization in aqueous solution using poly(ethylene glycol) diacrylate as a crosslinker. Structural characterization of prepared chemically crosslinked polymers were tried to determine by using Fourier Transform Infrared Spectroscopy (FT-IR). Scanning Electron Microscopy (SEM) micrographs were taken for determination of surface porosity of hydrogels. Dynamic swelling tests were applied at 25°C for the purpose of investigation of swelling properties of crosslinked copolymers. According to obtained data, parameters concerning swelling kinetics and diffusion mechanism were calculated. A cationic dye such as safranin T was selected as model molecule to investigate of adsorption properties of the hydrogels. It was determined that crosslinked copolymers adsorbed dye of safranin T from aqueous solutions in high level.

**Key words:** Acrylamide, carrageenan, clay, montmorillonite, hydrogel, composite, adsorption, safranin T.