

ABSTRACT

INVESTIGATION OF BIOPOTENTIAL USING CAPACITIES OF NEW POLYMERIC CARRIERS AND SORBENTS BASED GELATIN, ACRYLAMIDE, POLY(ETHYLENE GLYCOL) AND POLY(VINYL ALCOHOL)

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In this study, it was aimed that produce a new polymeric carrier/sorbent semi-IPNs and hydrogels by using acrylamide which is commonly used to produce crosslinked polymer and gelatin which is natural polymer as main components. Semi-IPNs and hydrogels were prepared by free radical polymerization in aqueous solution using of sodium acrylate and sodium styrene sulfonate as comonomers, poly(ethylene glycol) diacrylate as crosslinker. Gelatin as natural polymer, poly(vinyl alcohol) and poly(ethylene glycol) as synthetic polymers were used to prepare semi-IPN structure. Structural and thermal characterization of prepared chemically crosslinked polymers were tried to determine by using Fourier Transform Infrared Spectroscopy (FT-IR) and Thermogravimetric Analysis (TG)/Differential Thermogravimetry (DTG). Scanning Electron Microscopy (SEM) micrographs were taken for determination of surface porosity of semi-IPNs and 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 methyl violet was selected as model molecule to investigate of adsorption properties of semi-IPNs and hydrogels. It was determined that crosslinked copolymers adsorbed dye of methyl violet from aqueous solutions in high level. Resorcinol was selected as active substance for release study. Resorcinol was loaded into semi-IPNs and hydrogels during polymerization. Release of active substance from semi-IPNs and hydrogels carrying resorcinol was investigated at constant temperature.

Key words: Acrylamide, gelatin, interpenetrating polymer network, hydrogel, poly(vinyl alcohol), poly(ethylene glycol), sorption, methyl violet, release, resorcinol.