

Faculty of Science

Department: Chemistry

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Title: Removal of phenolic compounds using (2-hydroxyethyl methacrylate/acrylamidopyridine) hydrogel prepared by gamma radiation.

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Abstract:

Hydrophilic copolymers of 2-acrylamidopyridine (AP) and 2-hydroxyethylmethacrylate (HEMA) with different molar ratios were prepared by gamma irradiation-induced copolymerization using ⁶⁰Co gamma rays of 20wt% aqueous solutions of monomer mixtures. The prepared polymers were characterized by FTMR, NMR and TGA analysis. The capacities for the adsorption of phenolic compounds onto the copolymers were found to be 26.7, 12.5 and 8.5 mg/g polymer for phenol, 2,6-dimethylphenol (DMP) and 2,6-di-1-butylphenol (DBP), respectively, using 20% AP copolymer, when the ratio of AP increased to 50% in the copolymer composition the amount of the above mention phenols retained increased significantly to be 35.1, 30.1 and 17.2 mg/g polymer for phenol, 2,6-dimethylphenol (DMP) and 2,6-di-1-butylphenol (DBP), respectively. Increasing the pH of the medium resulted in increasing of the amount of adsorbed phenols by the polymers. The kinetics of the adsorption at different concentration was also investigated.

Key words:

Radiation, poly(HEMA/AP), phenolic compounds, adsorption, copolymerization

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Name: Hany El Hamshary

Title: Synthesis and water sorption studies of pH sensitive poly (acrylamide-co-itaconic acid) hydrogels

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Abstract:

Superabsorbent copolymers of acrylamide (Am) and itaconic acid (ItA) were prepared by free radical solution polymerization using sodium persulfate and N,N,N',N' – tetramethylenediamine (TMEDA) as initiating system at 35 °C . Two series were prepared. The first series (SA series) used varied amount of itaconic acid and fixed amount of N,N' –methylenebis-acrylamide (MBAM) , while in the second series (SB series) the amount of {MBAM} changed and the amount of itaconic acid was fixed. The swelling behavior was studied at room temperature and the swelling percentage, swelling kinetics parameters such as initial swelling rate, swelling rate constant, and diffusion parameters were determined. The effect of pH and saline sensitivity on swelling behavior was also studied.

Keywords:

Superabsorbent copolymers; Itaconic acid; pH sensitivity; swelling kinetics, Diffusion