NOVEL GRAFTED COPOLYMERS BASED ON CHITOSAN

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Graft polymerization of various monomers such as 2-hydroxyethyl acrylate (HEA), 2-hydroxyethylmeth acrylate (HEMA), N-vinyl pirrolidone (N-VP) onto chitosan (Cs, the weight-average molecular weight of the sample was 200,000 g/mol) was carried out in aqueous solutions using ammonium persulfate (APS). The deacetylation degrees of the chitosan were determined by FT-IR spectroscopy (Satellite 3000 spectrometer, Mattson, USA) and by $^1$H NMR spectroscopy (Brucker 300 NMR spectrometer, USA) were found to be 85% and 88%, respectively. Evidence of grafting and structure are discussed at comparing $^1$H NMR and FT-IR spectra and scanning electron microscopy images of chitosan and the grafted copolymer as well as solubility characteristics of the products. The effects of APS, monomer concentrations, reaction temperature and duration of graft polymerization on the grafting parameters, such as grafting percentage and grafting efficiency, were studied. It was shown that grafting percentage essentially depends on nature of the comonomers. At the same reaction condition it changes as Cs-HEMA > Cs-HEA > Cs-N-VP and in some cases reaches 450%

The modification performed results in an enhanced solubility in water of the products in a wider pH range, than the original unmodified chitosan.

Complexation of the grafted cationic copolymers of the chitosan with poly(acrylic acid) were studied by potentiometric and turbidimetric titration. The formation of interpolymer complexes was observed. It was shown that composition of the polycomplexes depends on the grafting percentage.