Synthesis and solution properties of a new ionic polymer and its behavior in aqueous two-phase polymer systems. Al-Muallem, Hasan A.; Wazeer, Mohamed I. M.; Ali, Sk. Asrof. Department of Chemistry, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia. Polymer (2001), Volume Date 2002, 43(4), 1041-1050.

Abstract

The amine salt, N,N-diallyl-N-carboethoxymethylammonium chloride, was copolymd. with SO2 in DMSO using ammonium persulfate or azobisisobutyronitrile (AIBN) to afford a cationic polyelectrolyte (CPE) having a five-membered cyclic structure on the polymeric backbone. The CPE on acidic (HCl) hydrolysis of the pendent ester groups gave the corresponding cationic acid salt (CAS) having the equiv. of the chloride salt of N,N-diallylammonio ethanoic acid as the monomeric unit. The CAS was converted into an anionic polyelectrolyte (APE) and polybetaine (PB) (having the monomeric unit equiv. of sodium N,N-diallylaminoethanoate and N,N-diallylammonioethanoate) by treatment with two and one equiv. of base, resp. The soln. properties of APE were investigated by potentiometric and viscometric techniques. The basicity const. of the amine functionality in APE is found to be 'apparent' and as such follow the modified Henderson-Hasselbalch equation; the protonation of the APE becomes more and more difficult as the degree of protonation (α) of the whole macromol. increases. The compn. and phase diagram of the aq. two-phase systems of APE and polyethylene glycol (PEG) was studied for the first time for this class of ionic polymers. The CAS and PB were virtually insol. in water.