

Abstract

Copolymerization of methacrylic acid (MAA) and Ethyl acrylate (EA) was performed by the emulsion polymerization technique in the presence of a mixture of ionic and nonionic emulsifiers, at 85°C, using potassium persulfate as initiator (0.16 wt % of monomer). The MAA:EA molar ratio was varied between 44:56 and 54:46 in the monomer feed. Copolymers of MAA and EA were synthesized by incorporating diallyl phthalate (DAP) with varying concentrations (0-1.7 mol % of total monomer) in the feed. A terpolymer latex of MAA, EA, and DAP was also prepared by the variable feed process. The intrinsic viscosity and gel content were determined. Copolymers were characterized by IR and NMR spectroscopic techniques. The composition of copolymers was determined by ¹H-NMR spectra and sequential distribution from ¹³C{¹H}-NMR spectra. The pH of the copolymer emulsion was varied between 3 and 10 and its effect on Brookfield viscosity was studied. The effects of copolymer composition, crosslinking agent concentration in the feed, monomer feed process, polymer solid contents, and shear rate on Brookfield viscosity were studied at pH approx. 8.