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POSTER

Modeling Studies on RAFT copolymerization of Styrene/Divinylbenzene in Aqueous Suspension

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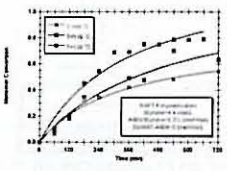
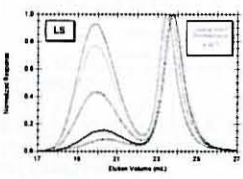
Experimental and theoretical studies concerning the RAFT copolymerization of styrene (S) and commercial divinylbenzene (DVB) were performed in order to assess the use of controlled radical polymerization (CRP) for the production of non-conventional polymer networks. Aqueous suspension polymerizations were carried out at a 1 L scale in a stirred batch reactor and changes of a few operation parameters were tried in order to assess their effect on key product properties. The reaction temperature was kept in the range 80 to 150 °C (pressurization used when needed) and different initial ratios RAFT agent/initiator were considered (2 to 10 mol/mol). Monomer dilution in the organic phase was changed between 20 and 50% (v/v) and crosslinker content in the monomer mixture between 0 and 100% (DVB homopolymerization). Polymerizations were extended beyond the gel point in order to synthesize gel beads. The effect of different commercially available RAFT agents (e.g. *S*-thiobenzoyl thioglycolic acid and different trithiocarbonates) on network process formation was also studied. Dynamics of gel formation was measured using size exclusion chromatography with refractive index and light scattering detection. Iodine chloride titration yielded pendant double bonds concentration. Network particles morphology was observed by SEM. A general kinetic aproach (*Chem. Eng. Sci. 2005, 60, 423*) was used for modeling studies, helping in the design of tailored networks. Some rules useful for production engineering could be established.





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