

The Effects of Reaction Temperature and Monomer Concentration on PMMA Particles Prepared by Dispersion Polymerization in Supercritical Carbon Dioxide

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Recently, supercritical CO₂(scCO₂) is used as a more environmentally friendly alternative to traditional solvents in polymerization. As a polymerization medium, the solvency of the supercritical fluid can be easily controlled by changing the density of the reaction medium through temperature and pressure profiling. So it is important to examine the effects of reaction temperature.

And the monomer itself behaves as a good solvent, its concentration is also significant on the reaction condition.

In this study, we report dispersion polymerization of methyl methacrylate(MMA) in scCO₂. It was performed using AIBN as the initiator and poly(perfluoroalkyl methacrylate) as the stabilizer at various temperature. The discrete spherical particles of PMMA were obtained and characterized by ¹H-NMR, GPC, SEM, and PSA. We focused on the effects of reaction temperature and concentration of monomer on the resulting PMMA particles.