

Recrystallization of Polystyrene by ASES Process in Supercritical CO₂

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The ASES (aerosol solvent extraction system) process, which is one of the SAS (supercritical antisolvent) processes, was select to recrystallize Polystyrene(PS) into submicrometer particles. In the ASES process, there are two key factors. One is atomization for fine droplets, and the other is mass transfer of droplets during precipitation in the vessel, which causes nucleation and growth of particles. They are affected by several elements such as temperature, pressure, concentration, injection rate of solution and feed rate of CO₂. In this work, we studied the effects of temperature, pressure, concentration, solution injection rate and CO₂ feed rate on atomization and mass transfer. From the variation of solution injection rate and feed rate of CO₂, we found out that the relative velocity difference between CO₂ and the PS/DCM solution was an important factor for fine PS particles.