

Synthesis of poly(acrylic acid) spherical particle by dispersion and cross-linking polymerization in compressed liquid dimethyl ether

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In this study, the dispersion polymerization of acrylic acid in compressed liquid dimethyl ether is performed. The chemical materials used in this study are acrylic acid as a monomer, dimethyl ether as a solvent, 2,2'-azobisisobutyronitrile (AIBN) as an initiator, Ethylene glycol dimethacrylate and N,N-methylene bisacrylamide (MBAm) as cross-linking agent, and five kinds of surfactants: PDMS-g-pyrrolidonecarboxylic acid (Monasil PCATM), PDMS modified surfactants, SS-5050KTM, KF-6017TM, poly(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl acrylate), and poly(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl methacrylate). The spherical and uniform particles are generated when using Monasil PCA without cross-linking agent. However, using cross-linking agent and Monasil PCA as surfactant, the generated particle are spherical, but more wider particle distribution than without crosslinkg agent.