

Jordan University of Science and Technology

Synthesis of Cross-Linked, Partially Neutralized Poly(Acrylic Acid) by Suspension Polymerization in Supercritical Carbon Dioxide

Authors: Yazan Ahed Hussain, Tao Liu, George W Roberts

Abstract: Particles of cross-linked, partially-neutralized poly(acrylic acid) (PAA) were synthesized in high yield via suspension polymerization of an aqueous solution of acrylic acid and sodium acrylate in supercritical carbon dioxide (scCO₂). Siloxane-based surfactants were used to produce particles with an acceptable size range for superabsorbent polymer applications. Several different surfactants were tested and the particle yield was used to compare their performance. The effects of surfactant concentration, degree of neutralization, and agitation rate on the yield and morphology are discussed.