

عنوان مقاله:

Synthesis of High Solid-Content Anisotropic Nanoparticles by Cosurfactant Free Microemulsion Polymerization

محل انتشار:

ششمین کنگره بین المللی مهندسی شیمی (سال: 1388)

تعداد صفحات اصل مقاله: 4

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خلاصه مقاله:

The objective of this study was to produce the finest anisotropic nano-particles through microemulsion polymerization. For this purpose we tried to develop a process, which yields a high solid content (HSC) and properly stable latex, despite the absence of co-surfactant. It is also considered that for being functional in the further applications, the resulting seed particles must be less than 50 nm in diameter. To achieve this goal, effect of variables such as surfactant and monomer concentrations and temperature on number average particle diameter was investigated. The HSC seed latex showed 32.3 nm of average particle diameter with the solid content of 25%, although other experiments with lower solid contents yielded smaller particles. These particles were later swelled by MMA monomer to form polystyrene/poly methyl methacrylate (PS/PMMA) interpenetrating polymer networks (IPNs). The consequent anisotropy was denoted to phase separation of second stage monomer from seed particle during the swelling and polymerization period. Other than chemical anisotropy of immiscible polymer pairs, reaction temperature and crosslink density are the most influential parameters on the final particle morphology. The average diameters of anisotropic particles were always smaller than 100 nm.

کلمات کلیدی:

Microemulsion- HSC latex- Nanoparticle- Anisotropic particle- Seed polymerization

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