기능성 레진을 이용한 구조화된 나노 입자의 특성

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Alkali-soluble random copolymer (ASR) was used as a functional resin in the emulsion polymerization of styrene to prepare structured nanoparticles. The calorimetric technique was applied to study the kinetics of emulsion polymerization of styrene using ASR and conventional ionic emulsifier, sodium dodecyl benzene sulfonate (SDBS). ASR could form aggregates like micelles and the solubilization ability of the aggregates was dependent on the neutralization degree of ASR. The rate of polymerization in ASR system was lower than that in SDBS system. This result can be explained by the creation of a hairy ASR layer around the particle surface, which decreases the diffusion rate of free radicals through this region. Although a decrease in particle size was observed, the rate of polymerization decreased with increasing ASR concentration. The higher the concentration of ASR is, the thicker and denser ASR layer may be, and the more difficult it would therefore be for radicals to reach the particle through this layer of ASR. The rate of polymerization decreased with increasing the neutralization degree of ASR. The aggregates with high neutralization of ASR are less efficient in solubilizing the monomer and capturing initiator radicals than that of the lower neutralization degree, which leads to decrease in rate of polymerization.

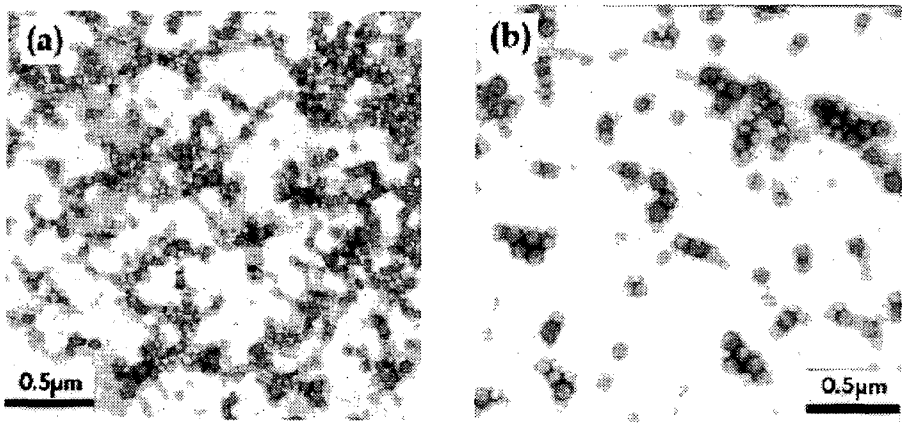

그림. 1. TEM photographs of PMMA latex prepared with 35 wt % of ASR: degree of neutralization of ASR; (a) 80 %, (b) 100 %.1

참고문헌

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