

Formation of Ag Nanoparticles with Various Morphology Using Amphiphilic Graft Copolymer Membranes

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Silver ions of poly(vinyl chloride)-g-poly(styrene sulfonic acid) (PVC-g-PSSA) graft copolymer were reduced to form silver nanoparticles under thermal condition (80°C). We were successful in synthesizing silver nanoparticles with various size and morphologies by changing reaction time. At short reaction times (~1 h), silver nanoparticles with 5 nm in size were formed without changing of microphase-separated structure of graft copolymer. At medium reaction times (~5 h), silver nanoparticles were aggregated to form large clusters ranging 30~50 nm in size. At much longer reaction times (~18 h), hurricane-like silver clusters were observed because of the strong particle aggregation.