

In-situ Formation of Silver Nanoparticles Created in Amphiphilic Block Copolymer Film

박정태, 이경주, 이도경, 김종학*
연세대학교 화학공학과
(jonghak@yonsei.ac.kr*)

Microphase-separated, amphiphilic diblock copolymer, i.e. polystyrene-blockpoly(1-vinyl-2-pyrrolidone) (PS-b-PVP) at 70:30 wt% was synthesized through atom transfer radical polymerization (ATRP). The self-assembled block copolymer film was used to template the growth of silver nanoparticles by introducing a AgCF₃SO₃ precursor and a UV irradiation process. The in situ formation of silver nanoparticles with 2 – 8 nm in size within the block copolymer template film was confirmed by transmission electron microscopy (TEM), UV-visible spectroscopy and wide angle xray scattering (WAXS). FT-IR spectroscopy also demonstrated the selective incorporation and the in situ formation of silver nanoparticles within the hydrophilic PVP domains, mostly due to stronger interaction strength of the silver with the carbonyl oxygens of PVP in the block copolymer.