

Synthesis and Characterization of Ag-Au Bimetal Nanoparticles by Templated Method on Amphiphilic PVC-g-PSSA Graft Copolymer Film

서진아, 박정태, 고종관, 김종학*
연세대학교 화공생명공학과
(jonghak@yonsei.ac.kr*)

Amphiphilic comb-like copolymer consisting of a poly(vinyl chloride) (PVC) backbone and poly(styrene sulfonic acid) (PSSA) side chains, i.e. PVC-g-PSSA at 68:32 wt% was synthesized via atom transfer radical polymerization (ATRP). This self-assembled graft copolymer film was used to template the growth of Ag-Au bimetallic nanoparticles in the solid state by introducing NaBH₄ as a reducing agent. The in situ formation of Ag-Au bimetallic nanoparticles in the graft copolymer film was confirmed by UV-visible spectroscopy, X-ray diffraction (XRD) and transmission electron microscopy (TEM). High resolution TEM picture showed the formation of spherical Au-Ag core-shell nanoparticles. To the best of our knowledge, this is the first report on the solid-state synthesis of Ag-Au bimetallic core-shell nanoparticles using amphiphilic comb-like copolymer film.

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