

**Amphiphilic Graft Copolymer :Poly(epichlorohydrine-g-styrene): Synthesis and Use
as Template Film for
in-situ Formation of Silver Nanocomposites**

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This work has demonstrated that a novel amphiphilic poly(epichlorohydrine)-graft-polystyrene (PECH-g-PS) copolymer at 34:66 wt% was synthesized via atom transfer radical polymerization (ATRP) of styrene using PECH as a macroinitiator. The structure of the graft copolymer was characterized by nuclear magnetic resonance (^1H NMR) and FT-IR spectroscopy, demonstrating that the “grafting from” method using ATRP was successful. The self-assembled graft copolymer was used as a template film for the in-situ growth of silver nanoparticles from AgCF_3SO_3 precursor under UV irradiation. The in situ formation of silver nanoparticles with 6 – 8 nm in average size in the solid state template film was confirmed by transmission electron microscopy (TEM), UV-visible spectroscopy and wide angle X-ray scattering (WAXS). Differential scanning calorimetry (DSC) also displayed the selective incorporation and the in situ formation of silver nanoparticles within the hydrophilic PECH domains, probably due to stronger interaction of the silvers with the ether oxygens of PECH backbone than that with hydrophobic PS side chains.