

## Templated synthesis of Ag loaded TiO<sub>2</sub> nanostructures using amphiphilic polyelectrolyte

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A graft-type amphiphilic polyelectrolyte, i.e. poly(vinylidene fluoride-co-chlorotrifluoroethylene)-g-poly(styrene sulfonic acid) (P(VDF-co-CTFE)-g-PSSA) with 47 wt.% of PSSA was synthesized via atom transfer radical polymerization (ATRP) and used as a template film for the in-situ formation of Ag nanoparticles. This nanocomposite material was further combined with titanium(IV) isopropoxide (TTIP) to form Ag loaded TiO<sub>2</sub> nanostructural hybrid materials. UV-visible spectroscopy, X-ray diffraction (XRD) and transmission electron microscope (TEM) revealed successful synthesis of Ag-TiO<sub>2</sub> nanostructures templated in the P(VDF-co-CTFE)-g-PSSA graft copolymer film. It was also found that the d-spacing of the graft copolymer in XRD patterns was increased from 4.1 to 4.4 Å, presumably due to the chain expansion resulting from the incorporation of nanoparticles in highly entangled polymeric chains.