

## Preparation of poly (styrene-co-acrylonitrile) grafted multi wall carbon nanotube by surface initiated atom transfer radical polymerization

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Copolymer brushes with multi wall carbon nanotube as backbones were synthesized by grafting styrene and acrylonitrile to the side walls via atom transfer radical polymerization (ATRP). Carboxylic acid groups on MWNT were first introduced by chromic acid treatment. The ATRP initiator (2-hydroxyethyl 2-bromobutyrate) was covalently attached to the surface of MWNT by esterification reaction with carboxylic acid groups. Polymer brushes formed on the surface of carbon nanotubes were characterized with FT-IR, scanning electron microscopy, thermogravimetric analysis and proton NMR. The molecular weight of the brushes was determined using gel permeation chromatography. Near Infrared and Raman spectra reveal that the degree of functionalization did not change significantly due to grafting of initiator or during the polymerization.