

### Enhanced dispersion of carbon nanotubes using amphiphilic PVC-g-POEM graft copolymer

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Multi-walled carbon nanotubes (MWCNTs) draw attention as promising materials because of their excellent electrical and mechanical properties. Nevertheless, irregular aggregations of MWCNTs resulted from intrinsic attractive interaction between MWCNTs offers a challenge to their use in various applications. Here, we present a facile method to disperse MWCNTs in a polar solution using a graft copolymer, poly(vinyl chloride)-graft-poly(oxyethylene methacrylate), PVC-g-POEM. The graft copolymer was synthesized via atom transfer radical polymerization (ATRP), as confirmed by gel permeation chromatography (GPC) and <sup>1</sup>H NMR spectroscopy. The MWCNTs were uniformly dispersed in a polar solvent such as dimethyl sulfoxide (DMSO) by the help of PVC-g-POEM as a dispersant, owing to interaction between MWCNT and the graft copolymer, as revealed by transmission electron microscopy (TEM) analysis. Upon removal of the solvent, free standing nano-composite membranes with good homogeneity were obtained.