Ionic Liquid Based Nanoparticle Emulsions as a Corrosion Inhibitor

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In this contribution, we report the facile preparation of cross-linked polymerizable ionic liquid (PIL)-based nanoparticles via thiol–ene photopolymerization in aminiemulsion. The synthesized PIL nanoparticles with a diameter of about 200 nmwere fully characterized with regard to their chemical structures, morphologies, and properties using different techniques, such as Fourier transform infrared spectroscopy, thermogravimetric analysis, scanning electronmicroscopy, and transmission electron microscopy [1]. To gain an in-depth understanding of the physical and morphological structures of the PIL nanoparticles in an emulsion, small-angle neutron scattering and ultra-small-angle neutron scattering were used. Neutron scattering studies revealed valuable information regarding the formation of cylindrical ionic micelles in the spherical nanoparticles, which is a unique property of this system. Furthermore, the PIL nanoparticle emulsion was utilized as an inhibitorin a self-assembled nanophase particle (SNAP) coating. The corrosion protectionability of the resultant coating was examined using potentio dynamic polarization and electrochemical impedance spectroscopy. The results show that the PIL nanoparticle emulsion in the SNAP coating acts as an inhibitor of corrosion and is promising for fabricating advanced coatings with improved barrier function and corrosion protection [1].

[1] M.Taghavikish et al., ACS Omega 1 (2016) 29?40.