Electrodeposition of PANI/MWCNT Coatings on Stainless Steel and Their Corrosion Protection Performances

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When used under corrosive conditions as a coating material, nanostructured composites demonstrated higher sensitivity and better performance. In this work, mild steel (MS) structures were effectively protected through enhancement of the mechanical and corrosive performances of polyaniline (PANI) coatings using functionalized carbon nanotubes (CNTs). Fourier transform infrared (FTIR) spectroscopy and cyclic voltammetry (CV) were used to measure the coatings. Electrochemical impedance spectroscopy (EIS) and the Tafel test were used to study the corrosion performance of polymer-coated MS configurations in a highly corrosive 0.5 M HCl solution. For all immersion times, the corrosion resistance of the PANI/MWCNT was found to be higher than that of other coatings.

Keywords: Carbon nanotubes; Polyaniline; Electrodeposition; Corrosion protection; Nanocomposite

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