Corrosion Protection of Carbon Steel by *Pongamia glabra* Oil-Based Polyetheramide Coatings

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Application of electrochemical techniques for corrosion studies of polyetheramide (PEtA) coatings on carbon steel is considered using electrochemical impedance spectroscopy (EIS) and potentiodynamic polarization studies, which are powerful techniques to better, understand the fundamental process of corrosion. In this paper, these techniques are discussed in detail as complementary approaches to understand the complex nature of coating degradation. The PEtA coating was synthesized from a *Pongamia glabra* oil-based fatty amide diol and bisphenol A. The synthesis was confirmed by Fourier transform infrared spectroscopic techniques. The PEtA coatings were applied on carbon steel strips and their physico-mechanical properties, such as scratch hardness, impact, conical mandrel, and pencil hardness tests, were characterized by standard methods. The surface morphology of the coatings was observed by scanning electron microscopy, and their thermal stability was assessed by thermogravimetric analysis. The anticorrosion properties of PEtA were assessed in a 3.5 wt% NaCl solution at room temperature using potentiodynamic polarization and EIS techniques. The PEtA coatings exhibit good physico-mechanical and anticorrosive properties for applications up to 350 °C.

Keywords: polyetheramide; coatings; potentiodynamic; corrosion; EIS.

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