



Effect of incorporated Aluminium nanoparticles on the corrosion performance of epoxy/polyamidoamine coating by Salt Spray Technique

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Abstract

In this current investigation, aliphatic amine-cured diglycidyl ether of bisphenol-A (DGEBA) based epoxy coating was mixed with certain weight % hardener polyamidoamine (1:2) and was coated on carbon steel panels with and without 1% nano crystalline Al powder. The corrosion behavior of the coated samples were investigated by exposing them in the salt spray chamber, for 500 hours. According to ASTM-B-117, the bath was kept at 35 °C and 5% NaCl containing mist was sprayed at 1.3 bars pressure. Composition of coatings was confirmed using Fourier-transform infrared spectroscopy (FTIR). Electrochemical characterization of the coated samples was done using potentiodynamic polarization technique and electrochemical impedance spectroscopy (EIS) technique. All the experiments were done in 3.5% NaCl solution. The nano Al coated sample shows good corrosion resistance property compared to bare Al sample. In fact after salt spray exposure no pitting or local damage was observed for nano coated sample and the coating gloss was negligibly affected. The surface morphology of coated and corroded samples were studied using scanning electron microscopy (SEM).

Keywords: DGEBA, Salt spray, FTIR, Nano Aluminium, Potentiodynamic polarization, EIS, SEM

Biography

Dr Seikh has completed his/her PhD in Materials and Metallurgical Engineering from Jadavpur University, India. He is the Associate Professor of King Saud University, KSA. He has over 60 publications that have been cited over 400 times, and his/her publication H-index is 10 and has been serving as an editorial board member of reputed Journals.

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