Keynote Speaker

Preparation of Complex of Polyaniline and Acrylic Ester Grafting Epoxy for Anticorrosion and Intrinsically Antistatic Coatings

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Abstract

In this paper, acrylic ester grafting epoxy with carboxyl groups (A-g-EP) was firstly prepared using solution polymerization. A complex of polyaniline (PANI) and A-g-EP (PANI-A-g-EP) was then prepared by in-situ chemical oxidation polymerization of aniline, which pre-reacted with the carboxyl groups of A-g-EP. FT-IR spectra confirmed the formation of the PANI-A-g-EP complex, and it has a unique self-crosslinking structure, which comes from ester formation between epoxy and carboxyl groups on the A-g-EP chain. Effects of PANI content on the glass transition temperature (T_g) and the thermal decomposition temperature (T_d) of A-g-EP were investigated. The partially oxidized emeraldine salt state of PANI in the complex was revealed by UV-Vis, FT-IR and cyclic voltammetry (CV). The antistatic property was investigated with a surface resistance measurement. Anticorrosion performances of PANI-A-g-EP complex coating on mild steel in 0.1M of H₂SO₄ solutions were investigated by electrochemical impedance spectroscopy (EIS). The anticorrosion and antistatic mechanisms were discussed.