Enhanced Dispersion of Graphene in Epoxy-Acrylic Waterborne Anticorrosion Coating: Bifunctional Ligands Linking Graphene to SiO₂

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The dispersion of graphene was improved by using a bifunctional ligand *p*-aminobenzoic acid (PABC) to anchor graphene (Gr) to SiO₂ particles (marked as SiO₂-PABC-Gr). This can avoid the phase separation and improve the dispersion of graphene in coatings. The materials were characterized by Fourier transform infrared spectroscopy (FT-IR), scanning electron microscope (SEM), X-ray diffraction (XRD) and Raman spectra to prove the linking structure. An epoxy-acrylic (EA) resin was used as the binder, which contained COOH groups to connect with SiO₂ particles. The synthesized SiO₂-PABC-Gr (1 wt%) was dispersed in EA resin and used as anticorrosion protection composite coating of low carbon steel, and the corrosion resistance was investigated by potentiodynamic polarization curve and electrochemical impedance spectroscopy (EIS). The results indicated that graphene was successfully linked to SiO₂ by PABC, and the application in EA resin can significantly improve the anticorrosion ability of the coating, which can be attributed to the high dispersion of graphene.

Keywords: Anticorrosion; graphene dispersion; composite; epoxy-acrylic resin; waterborne coating; bifunctional ligand

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