Corrosion Protection of Water-borne Epoxy Coatings Incorporated with Graphene

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In present study, phenosafranin (PSF) was employed to achieve the dispersion of graphene in water owing to the presence of π - π interaction which was also confirmed from the absorption free energy calculated by first principles based on density functional theory. In addition, water-borne epoxy (WEP) coatings containing graphene, PSF and PSF@G were prepared and fabricated on the electrodes. Meanwhile, the corrosion protection performance of different coatings during the immersion in 3.5 wt% NaCl solution was investigated and compared. It could be concluded from the results that PSF@G/WEP coating presented better protective performance than other coatings since the well dispersed graphene in WEP provided superior impermeability to corrosive medium. Besides, the PSF surfactant used to disperse graphene was also beneficial to improve the protective performance of the WEP coating.

Keywords: Graphene, Phenosafranin, π - π interaction, Water-borne epoxy, Corrosion protection

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