

Polyetherimide–graphene composite for corrosion protection of stainless steel 304. / H. Alhumade, A. Yu, A. Elkamel. / Nano Studies. – 2015. – # 12. – pp. 7-14. – eng.

Polyetherimide–graphene is investigated as corrosion protection coating on a Stainless Steel 304 substrate. Graphene is incorporated in the polymeric matrix using the in-situ polymerization approach. The dispersion of the filler is observed using Scanning Electron Microscopy and Transmission Electron Microscopy. The graphene based composite is cured by thermal imidization under vacuum to avoid degradation of the hosting polymer. The influences of incorporating graphene in the corrosion protection property of the hosting polymer in addition to the long-term performance of the protective coating are investigated. It was concluded that the addition of graphene may enhance the corrosion inhibition of stainless steel at a very low loading of the filler. This finding is supported by the observed results after conducting electrochemical techniques such as Tafel polarization and electrochemical impedance spectroscopy. Adhesion of the protective coating to the metal substrate is evaluated before and after 30 days of exposure to a 3.5 wt. % NaCl corrosive medium in order to confirm the long-time performance of the coating. Fig. 7, Tab. 1, Ref. 7.

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