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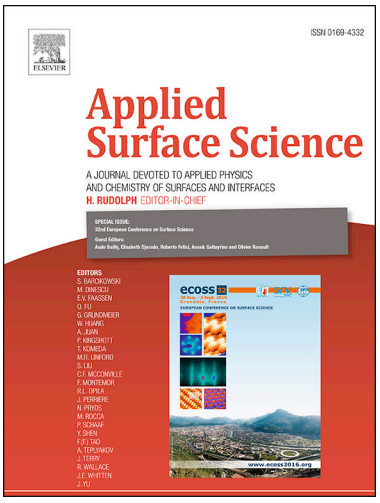

Full Length Article

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Effect of oxygen-containing functional groups in epoxy/reduced graphene oxide composite coatings on corrosion protection and antimicrobial properties

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Abstract

In this work, reduced graphene oxides (RGO) with different contents of oxygen-containing functional groups are filled into epoxy matrix for corrosion protection and antimicrobial investigation. Results show that the structure, dispersion, and surface properties of RGO sheets in epoxy matrix are controlled by the content of oxygen-containing functional groups. The epoxy-based composite coating that involves 0.25 wt % graphene sheets (reduced by hydrazine hydrate for 1 h) exhibits excellent corrosion protection behaviors owing to synergism of the barrier effect, impenetrability, and hydrophobicity. Meanwhile, the epoxy/RGO coating shows the antimicrobial potentiality due to oxidative stress in the composite.

Keywords: reduced graphene oxide; epoxy; coatings; corrosion protection; antimicrobial properties