عنوان مقاله:

Smart Self-Healing Nanostructured Multilayered Coatings Containing Graphene Oxide and Inhibitor for Corrosion Protection of ۲۰۲۴ Aluminum Alloy

محل انتشار:

تعداد صفحات اصل مقاله: 12

نویسنده:

خلاصه مقاله:

In self-healing coatings, corrosion inhibitors should be properly incorporated into the coating so that smart release of the inhibitor can occur in case of corrosion process. In this work, for the first time, multi-layered nanostructured self-healing coatings including sol-gel/ PEI-PAA polyelectrolyte pair / benzotriazole corrosion inhibitor / graphene oxide have been prepared to protect the surface of ۲۰۲۴ aluminum alloy. Local pH changes due to corrosion trigger the smart release of corrosion inhibitors, thus protecting the substrate surface. The presence of graphene oxide layer also prevents the penetration of water and corrosive agents to the substrate surface. SEM and EDS tests were used to study the morphology, chemical composition and distribution of constituent elements. The release of corrosion inhibitor in response to local pH changes was studied by UV-vis spectroscopy. FTIR and RAMAN tests were used to ensure the formation of a graphene oxide layer. Self-healing ability and corrosion protection of the coatings was studied by electrochemical impedance spectroscopy (EIS). The results showed that the smart multilayered coatings have superior corrosion protection performance compared to hybrid sol-gel monolayer

کلمات کلیدی:

Self-healing, corrosion, encapsulation, layer by layer, graphene oxide,
پوشش خود ترمیم شونده, رهایش هوشمند, نانو ساختار, لایه به لایه, بازدارنده خوردگی, خوردگی, پلی الکترولیت

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