Layer-by-Layer Self-assembled Graphene Oxide Nanocontainers for Active Anticorrosion Application

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This work presents the synthesis of a new type of graphene oxide nanocontainer and their application for developing active anticorrosion coatings. The graphene oxide nanocontainers encapsulated with polymeric ionic liquid, a corrosion inhibitor, were prepared through a facile procedure based on layer-by-layer assemble technology. The variations of zeta potential confirmed the construction process of nanocontainers. Electrochemical impedance spectroscopy was employed to investigate the anticorrosion performance of composite coatings. Results indicated that the introduction of nanocontainers significantly enhanced the corrosion resistance of polymer coatings. The embedded polymeric ionic liquid could exert its corrosion inhibition effect at defects interface, providing active anticorrosion ability for coating. Meanwhile, the durable passive anticorrosion property was also possessed, which attributed to the impermeable graphene oxide nanosheets. This novel nanocontainer endowed the coating system with superior barrier property and corrosive inhibitor function.

Keywords: nanocontainer, graphene, coating, active anticorrosion

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