Short Communication

Anticorrosion Performance of Epoxy-Resin Coating Incorporating Talcum Powder Loaded with Sodium Tungstate

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A self-healing coating is a smart anticorrosive coating that integrates the inhibitor-loaded talcum powder into the coating to enable long-term protection for metallic materials. In the present work, sodium tungstate was used as the corrosion inhibitor and embedded into the layered channels of talcum powder. The resulting mixture was added to an epoxy-resin coating to create a new anticorrosive and self-healing coating. The self-healing ability of the prepared coating was investigated using electrochemical impedance spectroscopy and salt spray tests. The results revealed that the arc radius increased by one order of magnitude compared to the blank samples and the impedance remained greater than $10^9 \Omega \text{ cm}^2$ after 25 days of soaking. Meanwhile, after 90 h of salt spraying, only slight corrosion appeared at the cross-cut of the composite coating, which contained talcum powder loaded with sodium tungstate, whereas the blank samples, suffered significant corrosion. In addition, infrared analysis, XRD and scanning electron microscopy were used to study the composition and morphology of the coating.

Keywords: self-healing; epoxy-resin; sodium tungstate; inhibitor;

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