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Anti-corrosion performance of an epoxy ester coating filled with a new generation of hybrid green organic/inorganic inhibitive pigment; Electrochemical and surface characterizations

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Abstract: In this study the effect of a hybrid organic/inorganic pigment based on zinc acetate-Cichorium intybus L leaf extract on the corrosion protection properties of an epoxy ester coating were studied. Results of electrochemical impedance spectroscopy (EIS) revealed that the mild steel corrosion was significantly inhibited in the chloride solution in the presence of hybrid pigment extract. Results exhibited that with the increase in immersion time up to 24 h the corrosion inhibition efficiency significantly increased and reached the maximum value of 94%. Results obtained from the scanning electron microscopy (SEM), X-ray photoelectron spectroscopy (XPS) and energy dispersive spectroscopy (EDS) techniques confirmed the deposition of inhibitive films on the mild steel surface. Results showed that in the presence of hybrid pigment not only the barrier but also the active inhibition properties of the epoxy ester coating were effectively enhanced. The low frequency impedance value of the epoxy ester coating was increased in the presence of hybrid pigment, indicating the role of pigment on the

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