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Polypyrrole as a Perfect Corrosion Inhibitor for Mild Steel in Hydrochloric Acid Solution

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Abstract : Polymer is a suitable coating material on plain carbon (mild) steel to prevent corrosion in acidic media such as hydrochloric acid. In this study, polymerization of the coating agent at high current density forms large and round micro particles with a rough surface. Alternatively, polymerization of the polymer coating at low current density forms a smooth and homogenous polymer surface. From the electrochemical impedance measurement studies, the performance of polypyrrole as corrosion inhibitor was evaluated to be 82.40% efficient, while the potentiodynamic polarization studies show the effectiveness of polypyrrole was 60.72%. The polypyrrole works as a corrosion inhibitor to prevent corrosion of carbon steel in 1.0M hydrochloric acid. The approach to increase the performance and effectiveness of polypyrrole was carried out to ensure the performance and film stability of the polypyrrole.

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