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Inhibition Efficiency of Cinnamon Oil as a Green Corrosion Inhibitor

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Abstract: The corrosion inhibition efficiency of cinnamon oil for stainless steel 304 L in 0.1 and 1.0 M HCl solutions was investigatedusing electrochemical study and surface electronic observation. The potentiodynamic polarization curves showed that, independentlyof the time of immersion in 1.0% HCl, a reaction to the anode occurred, which was explained by the dissolutionof the metal due to the strong aggressiveness of the medium; the addition of 1% cinnamon oil led to a corrosion efficiencyof 84%. Furthermore, in 0.1 M aggressive medium the tests with addition of inhibitor showed that the inhibition efficiencyincreases (86.6–96.0%) with an increase in the cinnamon oil concentration from 0.5 to 5%. Scanning electron microscopeobservations of metal surface confirmed the existence of a protective adsorbed film of the inhibitor on the steel surface. Cinnamonoil can be proposed as an efficient green inhibitor of corrosion of stainless steel exposed to hydrochloric acid mediums.

Keywords : Aggressive medium · Cinnamon oil · Corrosion inhibitor · Stainless steel