Electrochemical and Theoretical Study of Imidazole Derivative as Effective Corrosion Inhibitor for Aluminium

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The corrosion inhibition performance of 2-styryl-1,8-dihydro-1,3,8-triaza-cyclopentaindene (IIZ) on Aluminium in 1M HCl was investigated by electrochemical impedance spectroscopy (EIS), Potentiodynamic polarization, scanning electron microscopy (SEM), atomic force microscopy (AFM), and quantum chemical techniques. Potentiodynamic polarization study confirmed that IIZ is mixed type inhibitor with cathodic predominance. SEM and AFM confirm the formation of an adsorption film on the aluminium surface. Quantum chemical study reveals that protonated IIZ interacts more than neutral IIZ. The theoretical data obtained are in agreement with experimental results.

Keywords: Aluminium; Imidazole derivative, Corrosion; Electrochemical; AFM

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