

## Nickel Corrosion Inhibition in Sulfuric Acid-Electrochemical Studies, Morphologies, and Theoretical Approach

derivatives, namely, malonic acid (MAD), succinic acid (SAD), and adipic acid (AAD) dihydrazide, was tested in relation to nickel corrosion in 1.0 M sulfuric acid ( $\text{H}_2\text{SO}_4$ ) solution. Electrochemical methods (Tafel polarization, linear polarization resistance [LPR], and electrochemical impedance spectroscopy [EIS]) were used, complemented with scanning electron microscopy/energy-dispersive x-ray (SEM/EDX) examinations. Computational studies were also used to confirm experimental findings and to optimize the adsorption structures of dihydrazide derivatives. Results showed that the three tested dihydrazides inhibited Ni corrosion (mixed-type inhibitors) to an extent, depending on the type and concentration of the introduced inhibitor. SEM studies revealed that the corroded areas on the surface were decreased in the presence of additives to an extent, depending on the type and concentration of the tested inhibitor. Results obtained from electrochemical measurements are in good agreement with theoretical studies