

INVESTIGATION ON *N*-FORMYL PIPERIDIN-4-ONES AS CORROSION INHIBITORS FOR CARBON STEEL IN ACID MEDIUM

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ABSTRACT

The corrosion inhibition of mild steel in 1N H₂SO₄ and 1N HCl in the presence of *N*-formyl piperidin-4-ones was studied using gravimetric and electrochemical techniques. Results obtained show that these compounds are excellent inhibitors and inhibit better in HCl than in H₂SO₄. The potentiodynamic polarisation studies clearly reveal that they are mixed type inhibitors. The impedance parameters (R_{ct} and C_{dl}) clearly indicate the adsorption of *N*-formyl piperidin-4-ones on the metal surface leading to the formation of a protective layer which grows with increasing exposure time. The adsorption of *N*-formyl derivatives on mild steel surface in both the acid media follows a Langmuir adsorption isotherm and Tempkin adsorption isotherm. The mild steel-FP complex layer formed at the metal surface was identified by infrared spectral analysis and SEM/EDS.

KEYWORDS: 1. Corrosion Inhibitors, 2. Mild Steel, 3. Electrochemical Impedance Spectroscopy, 4. Polarisation Curves, 5. Adsorption Isotherm, 6. *N*-Formyl Piperidin-4-One, 7. FT-IR , 8. SEM/EDS