

THE SUBSTITUTED *N*-NITROSO PIPERIDIN-4-ONES: A NEW CLASS OF INHIBITORS OF MILD STEEL IN ACID MEDIUM

A. ILAMPARITHI¹, A. SELVARAJ² & S. PONNUSWAMY³

^{1,3}PG and Research, Department of Chemistry, Government Arts College (Autonomous), Coimbatore, Tamil Nadu, India

¹Department of Chemistry, Gobi Arts and Science College (Autonomous), Gobichettipalayam, Tamil Nadu, India

²PG and Research, Department of Chemistry, CBM College, Coimbatore, Tamil Nadu, India

ABSTRACT

The *N*-nitroso piperidin-4-ones synthesized in the laboratory were used to study the effect of corrosion of mild steel in 1N H₂SO₄ and 1N HCl. Weight loss and electrochemical techniques were used to monitor the corrosion behaviour on mild steel. The results so obtained reveal that all the *N*-nitroso derivatives are excellent corrosion inhibitors for low carbon steel in 1N H₂SO₄ and 1N HCl. Potentiodynamic polarization studies have shown that all these compounds suppress both anodic and cathodic process and behave as mixed type inhibitors. The ac impedance studies indicate that the adsorption process is involved in corrosion inhibition. The adsorption of these compounds on mild steel surface is found to obey Langmuir adsorption isotherm and Tempkin adsorption isotherm. The adsorbed compounds were characterized by FT-IR spectra. The surface morphology was also studied by SEM as well as EDS analysis. The results were corroborated by measuring thermodynamic parameters.

KEYWORDS: FT-IR, Mild Steel (MS), *N*-nitroso Piperidones, Nyquist Plots, Polarization Curve, SEM/EDS, Tafel Plots