

## **Corrosion inhibition of mild steel in hydrochloric acid solution using fatty acid derivatives**

### **ABSTRACT**

The inhibitive actions of fatty acid derivatives namely palmitate hydrazide (PH), N-ethylidene palmitate hydrazide (EPH) and N-phenylmethylidene palmitate hydrazide (PPH) on mild steel in 1 M hydrochloric acid were investigated using open circuit potential, linear polarisation and electrochemical impedance spectroscopy techniques. It was observed that the percentage of inhibition efficiency ( $\eta\%$ ) increased with increasing concentrations of inhibitor and temperature of test medium. The maximum  $\eta\%$  approaches 85% in the presence of 200 mg litre<sup>-1</sup> of inhibitors EPH and PPH at  $308 \pm 1\text{K}$ . The inhibitor efficiencies were found to be in the following order: PPH>EPH>PH. The adsorption of these inhibitors on mild steel surface obeys Langmuir adsorption isotherm. They act as mixed-type inhibitors. Scanning electron microscopy-energy dispersive X-ray (SEM-EDX) was also carried out on polished mild steel coupons and those immersed in the test medium with the absence and presence of 200 mg litre<sup>-1</sup> of the inhibitors studied.

**Keyword:** Corrosion inhibition; Fatty acid derivatives; Mild steel; Schiff base