**ABSTRACT**

Lanthanides have been evaluated as new corrosion inhibitors for the corrosion of iron in 3.5% NaCl solutions using electrochemical techniques [potentiodynamic polarization, electrochemical impedance spectroscopy, and electrochemical frequency modulation]. The adsorption of lanthanides on iron surface was found to be of neither a typical physisorption nor a typical chemisorption mode. Increase in temperature increases corrosion rate but decreases inhibition efficiency. The thermodynamic functions of activation have been evaluated. The polarization measurements indicated that the inhibitors are of mixed type. The adsorption of these compounds was found to obey Langmuir’s adsorption isotherm. The analysis of scanning electron microscopy and electron dispersion X-Ray confirmed the formation of precipitates of lanthanides on iron surface, which reduced the overall corrosion reaction.

**Keywords:** Corrosion; Inhibition; Iron; NaCl; Lanthanides; EIS; EFM