**ABSTRACT**

The Inhibition effect of corrosion of mild steel using Thiadiazolines in H2SO4 medium by weight loss, electrochemical methods was investigated. The corrosion inhibition was studied in H2SO 4 by weight loss method for about 3hrs at room temperature and It was found that the corrosion inhibition behaviour of Thiadiazolines is greater in sulphuric acid. Results were fitted into suitable adsorption isotherm. The Electrochemical parameters for mild steel in H2SO4 solution with and without inhibitor were calculated. The data revealed that Electrochemical polarization shows the Mixed Mode of inhibition and the results of Electrochemical impedance spectroscopy have shown that the change in the impedance parameters, charge transfer resistance and double layer capacitance with the change in concentration of the inhibitor is due to the adsorption of the molecules leading to the formation of a protective layer on the surface of mild steel. The Effect of Temperature on the corrosion rate, activation energy and free energy of adsorption were also calculated.