**ABSTRACT**

The corrosion inhibition of mild steel in 0.5M H2SO4 by indoloimidazole derivative namely, (3,4-dihydro-2-(phenyl)imidazo[4,5-b]indole) (DPI) has been studied using weight loss, potentiodynamic polarization, electrochemical impedance and quantum chemicalstudies. Inhibition was found to increase with increasing concentration of the inhibitor. The effect of temperature on the corrosion behaviorof mild steel was studied in the range of 303 K-343 K. Potentiodynamic polarization results show that the inhibitors act as mixed type in0.5M H2SO4. The adsorption of the inhibitors on the mild steel surface follows Langmuir and Tempkin adsorption isotherms at 303K.Molecular modeling has been conducted to correlate the corrosion inhibition properties with the calculated quantum chemical parameters.