**ABSTRACT**

The inhibitive performance of 2-[(5-phenyl-1,3,4-oxdiazol-2-yl)methyl]-2H-benzo[b] [1,4] thiazin-3-one (POBT) for low carbon steel corrosion in 1 M H2SO4 has been evaluated by non-electrochrmical, and electrochemical measurements. Efficiency of the inhibitor enhanced with inhibitor concentration and declined with rise in temperature. 92.39% inhibition efficiency was attained using 0.1mM of POBT. Anticorrosive effect of the inhibitor is owing to the adsorption of POBT molecules on the metal surface. Mono layer adsorption of inhibitor was favored by observing the best fit with Langmuir isotherm. Polarization measurements reveal that the inhibitor behaves as mixed type. Surface analysis by scanning electron microscopy (SEM) and energy dispersive X-ray spectrometry (EDX) confirm the existence of a protective film of POBT on low carbon steel surface. Quantum chemical parameters obtained using density functional theory (DFT) method complements the above results.