**ABSTRACT**

The influence of two benzofused heterocyclic compounds, namely 2-phenylquinazolin-4(3H)-one(PQO) and 2-phenyl-4H-benzo[d]oxazin-4-one(POO) in controlling mild steel corrosion in 1 M H2SO4 solution was investigated using gravimetric and electrochemical methods. The experimental results revealed that both the inhibitors inhibit corrosion and their inhibition efficiency follows the order PQO > POO. A mixed mode of inhibition from polarization and a charge transfer mechanism from impedance study in the absence and presence of inhibitors were found. The passive film formed on the mild steel surface was characterized using SEM-EDX. Quantum chemical parameters derived using DFT performed at B3LYP/6-31G(d, p) level were used to correlate the molecular structure.