



Corrosion Protection of C-Steel in Hydrochloric Acid Solutions Using Flaxedil (Gallamine Triethiodide) Drug

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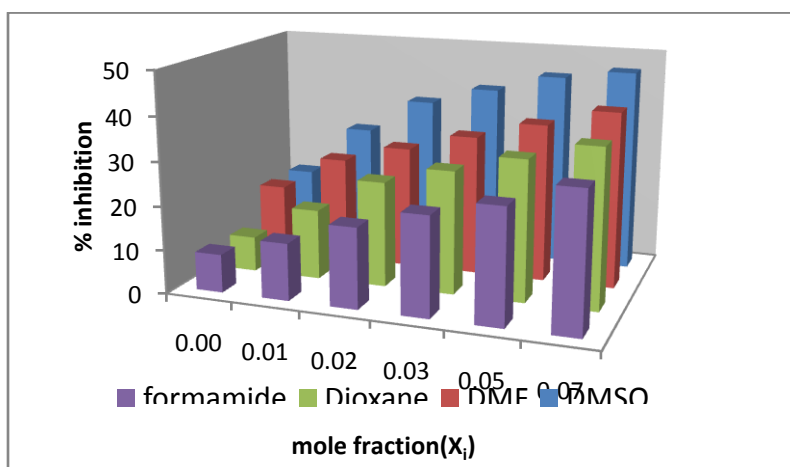
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Accepted on 15th September 2017, Published online on 27th September 2017

ABSTRACT

The inhibiting effect of Flaxedil (FD) as corrosion inhibitor of carbon steel (CS) in 1 M HCl was studied by gravimetric technique (GT), potentiodynamic polarization (PP), electrochemical frequency modulation (EFM) and electrochemical impedance spectroscopy (EIS) measurements. Polarization curves showed that Flaxedil behaved as mixed-type inhibitor. The adsorption isotherm of Flaxedil on the CS surface follows Temkin adsorption isotherm. Some thermodynamic parameters were calculated and discussed. The results indicated that the inhibition efficiency increases with increasing the dose of the drug, while decreases with increasing the temperature. Some quantum chemical parameters and the Mulliken charge densities for Flaxedil were calculated by the semi-empirical AM1 method to provide further insight into the mechanism of inhibition of the corrosion process. The results obtained from chemical and electrochemical techniques are in good agreement.

Graphical Abstract



Keywords: Carbon steel, Corrosion inhibition, EIS, SEM, EFM, Flaxedil, HCl .