Int. J. Electrochem. Sci., 12 **(2017)** 4215 – 4237

International Journal of
ELECTROCHEMICAL
SCIENCE
www.electrochemsci.org

Anti-corrosive Properties of New Eco-friendly Dimethylamino Compounds on C- steel Corrosion in 2 M HCl

A.M. Eldesoky[1], *M.A. Diab*[2,*], *A.Z. El-Sonbati*[2] *and S.F.Salam*[2]

[1]Engineering Chemistry Department, High Institute of Engineering &Technology (New Damietta), Egypt and Al-Qunfudah Center for Scientific Research (QCSR), Chemistry Department, Al-Qunfudah University College, Umm Al-Qura University, KSA.
[2]Chemistry Department, Faculty of Science, Damietta University, Damietta 34517, Egypt.
[*]E-mail: m.adiab@yahoo.com

doi: 10.20964/2017.05.73

Received: 29 January 2017 / *Accepted:* 11 April 2017 / *Published:* 12 April 2017

The inhibitive effect of new eco-friendly dimethylamino compounds , named (2E,4E)-5-(4-(Dimethylamino)phenyl)-1-(pyridin-2-yl)penta-2,4-dien-1-one (Compound (I)) and (E)-1-(Anthracen-10-yl)-3-(4-(dimethylamino)phenyl)prop-2-en-1-one (Compound (II)) versus CS and its adsorption habit were obtain in 2 M HCl solution utilized Weight loss, TP, (EIS) and (EFM) techniques. The outcome obtain from IE improve with the raising the inhibitor dose. The %IE orders of organic compound are follow: Compound (II) > Compound (I). Kinetic activation parameters such as activation energy, entropy and enthalpy of activation were obtained from the influence of temperature on inhibition and corrosion. The types of new eco-friendly dimethylamino compounds are mixed kind inhibitor whose adsorption found by isotherm Temkin. EIS diagrams show that adsorption of new eco-friendly dimethylamino compounds increases the transfer resistance and decrease the capacitance of interface metal/solution. The morphology of inhibited CS was evaluated by SEM and EDX. Relation among calculations of quantum chemical and protection efficiency of the investigated assembled is confirmed by utilized the Density Functional Theory (DFT). Molecular docking was utilized to predict the binding among new eco-friendly dimethylamino compounds and the receptor of breast cancer mutant 3hb5-oxidoreductase.

Keywords: Eco-friendly, Adsorption, C-steel, SEM–EDX, Molecular docking.

FULL TEXT