Evaluation of Some Organic Compounds Containing O, N and S Atoms as Corrosion Inhibitors for Stainless Steel 304 in Acid Solutions

A. S. Fouda^{1,*}, M. A. Diab², A.Z. El-Sonbati² and Sh. A. Hassan¹

¹ Department of Chemistry, Faculty of Science, El-Mansoura University, El-Mansoura, 35516, Egypt, Tel: +2050 2365730; Fax: +2 050 2202271,

² Department of Chemistry, Faculty of Science, Damietta University, Damietta, Egypt

*E-mail: asfouda@hotmail.com

doi: 10.20964/2017.06.66

Received: 25 February 2017 / Accepted: 23 April 2017 / Published: 12 May 2017

The corrosion protection of stainless steel 304 (SS 304) in molar HCl solutions utilized by some organic compounds has been investigated by (WR) weight reduction, (EFM) electrochemical frequency modulation, (EIS) electrochemical impedance spectroscopy, (PP) potentiodynamic polarization tests and (AFM) atomic force microscope. It was found that inhibition rise with improving inhibitor dose and break down with temperature rising. The adsorption of organic compounds on SS 304 surface follows the Temkin's isotherm. PP experiments were performed at different solutions showed that these compounds act as mixed-kind inhibitors. Further, calculations of theoretical tests were occurred and correlations among experimental protection efficiency (% ω) and computed parameters were illustrated.

Keywords: Stainless steel 304; Corrosion inhibition; Hydrochloric acid; Organic compounds

[FULL TEXT](#)

© 2017 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).