Impact of *Conyza bonariensis* extract on the corrosion protection of carbon steel in 2 M HCl solution

K.J. Al-Sallami^{1,2}, K. Shalabi¹, A.S. Fouda^{1,*}

¹ Chemistry Department, Faculty of Science, Mansoura University, Mansoura, Egypt

² Chemistry Department, Faculty of Science, Mustansiriyah University, Baghdad, Iraq

*E-mail: asfouda@hotmail.com

Received: 25 xMay 2021 / Accepted: 1 July 2021 / Published: 10 August 2021

Herein, we study the use of *Conyza bonariensis* extract as eco-friendly corrosion inhibitor for carbon steel (CS) in 2 M HCl. This study was evaluated by weight loss (WL), electrochemical frequency modulation (EFM), potentiodynamic polarization (PP), and electrochemical impedance spectroscopy (EIS). The morphology of inhibited carbon steel was analyzed by scanning electron microscope (SEM), energy-dispersive X-ray spectroscopy (EDX) and Atomic Force Microscopy (AFM). Results obtained indicated that the inhibition efficiency was improved by increasing the concentration of *C. bonariensis* and decreased by raising the temperature. PP curves showed the ability of *C. bonariensis* plant to serve as a mixed-type inhibitor. Moreover, the EIS results confirmed that the adsorption of *C. bonariensis* on CS surface by lowering the values of double layer capacitance (C_{dl}) and increasing the values of charge transfer resistance (R_{ct}) with increasing of the concentration. All tests gave almost similar results.

Keywords: Corrosion inhibition; Carbon steel; HCl; *Conyza bonariensis*; EIS; SEM; AFM

[FULL TEXT](#)

© 2021 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/>).