Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

"Gheorghe Asachi" Technical University of Iasi, Romania

ASSESSMENT OF THE CORROSION INHIBITION EFFECT OF FLAVONOID EXTRACTS OF RUTA CHALEPENSIS ON *API 5L X52* STEEL IN 1M HCl MEDIUM

Meryem Amal Benghalia[1,2], Chahinez Fares[2], Abdelkader Khadraoui[3], Mohammed Hadj Meliani[2,4], Rami K. Suleiman[5]*, Ahmad A. Sorour[5], Ihor M. Dmytrakh[6], Zitouni Azari[4]

[1]*Laboratory for Water & Environment, Faculty of Technology, Hassiba Benbouali University of Chlef, B.P. 151, 02000 Chlef, Algeria*
[2]*Laboratory for Theoretical Physics and Material Physics, Hassiba Benbouali University of Chlef, B.P. 151, 02000 Chlef, Algeria*
[3]*Laboratoire de la valorisation des substances naturelles, Université Djilali Bounaama, Khemis-miliana, Algérie*
[4]*Laboratory LEM3, UMR CNRS 7239, 1 road d'Ars Laquenexy, CS 65820, 57078 Metz, France*
[5]*Center of Research Excellence in Corrosion, King Fahd University of Petroleum & Minerals (KFUPM), Dhahran 31261, Saudi Arabia*
[6]*Karpenko Physico-Mechanical Institute of National Academy of Sciences of Ukraine, 5 Naukova Street, 79060 Lviv, Ukraine*

Abstract

The development of green eco-friendly inhibitors for the corrosion of metallic surfaces in acid media is still considered as a major challenge and target for corrosion-mitigation engineers. We have prepared in this work 4 different extracts from the plant *Ruta Chalepensis* using methanol, chloroform, ethyl acetate and aqueous ethyl acetate solvent systems. The flavonoids content, as well as the other oxygenated compounds, in the 4 extracts was carefully screened using the gas chromatographic – mass spectrometry (*GC-MS*) technique. The corrosion inhibition property of all extracts for *API 5L X52* steel in the hydrochloric acid medium has been carefully assessed using electrochemical techniques and surface-morphological characterizations. Our results revealed promising corrosion-inhibition properties for the methanol and chloroform extracts compared to other extracts and suggest a potential applicability for the flavonoids from the studied plant as green corrosion inhibitors for steel substrates in acid media.

Key words: Ruta Chalepensis, Corrosion inhibitors, flavonoids, *API 5L X52* steel

Received: February, 2017; Revised final: September, 2018; Accepted: October, 2018

* Author to whom all correspondence should be addressed: e-mail: ramismob@kfupm.edu.sa; Phone: +966-13-8607580; Fax: +966-13-8603996