

Accepted Manuscript

Synthesis, characterization and corrosion inhibition studies of N-phenyl-benzamides on the acidic corrosion of mild steel: Experimental and computational studies

Ankush Mishra, Chandrabhan Verma, H. Lgaz, Vandana Srivastava, M.A. Quraishi, Eno E. Ebenso



PII: S0167-7322(17)35189-9
DOI: doi:[10.1016/j.molliq.2017.12.011](https://doi.org/10.1016/j.molliq.2017.12.011)
Reference: MOLLIQ 8307
To appear in: *Journal of Molecular Liquids*
Received date: 31 October 2017
Revised date: 1 December 2017
Accepted date: 4 December 2017

Please cite this article as: Ankush Mishra, Chandrabhan Verma, H. Lgaz, Vandana Srivastava, M.A. Quraishi, Eno E. Ebenso , Synthesis, characterization and corrosion inhibition studies of N-phenyl-benzamides on the acidic corrosion of mild steel: Experimental and computational studies. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi:[10.1016/j.molliq.2017.12.011](https://doi.org/10.1016/j.molliq.2017.12.011)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Synthesis, characterization and corrosion inhibition studies of N-Phenylbenzamides on the acidic corrosion of mild steel: Experimental and computational studies

Ankush Mishra^a, Chandrabhan Verma^{b,c*}, H. Lgaz,^{d,e} Vandana Srivastava^a, M. A. Quraishi^{a,f}, and Eno E Ebenso^{b,c**}

^aDepartment of Chemistry, Indian Institute of Technology (Banaras Hindu University), Varanasi-221005,

^bDepartment of Chemistry, School of Chemical and Physical Sciences, Faculty of Natural and Agricultural Sciences, North-West University, Private Bag X2046, Mmabatho 2735, South Africa

^cMaterial Science Innovation & Modelling (MaSIM) Research Focus Area, Faculty of Natural and Agricultural Sciences, North-West University, Private Bag X2046, Mmabatho 2735, South Africa

^dLaboratory of Applied Chemistry and Environment, ENSA, Universite Ibn Zohr, PO Box 1136, 80000 Agadir, Morocco.

^eLaboratory of separation methods, Faculty of Science, Ibn Tofail University PO Box 242, Kenitra, Morocco

^fCenter of Research Excellence in Corrosion, Research Institute, King Fahd University of Petroleum & Minerals, Dhahran 31261, Saudi Arabia.

Corresponding Author's Emails: C. Verma (chandraverma.rs.apc@itbhu.ac.in);

Eno. Ebenso (Eno.Ebenso@nwu.ac.za)

Abstract:

Present study aims to demonstrate the effect of electron withdrawing nitro (-NO₂) and electron releasing methoxy (-OCH₃) substituents on the inhibition behavior of N-Phenylbenzamide derivatives (BNAs), namely N-(4-nitrophenyl) benzamide (BNA-1; -NO₂), N-phenylbenzamide (BNA-2; -H) and N-(4-methoxyphenyl)benzamide (BNA-3; -OCH₃) for mild steel acidic (1M HCl) corrosion. Results of the computational and experimental studies showed that methoxy (-OCH₃) substituent enhances the inhibition efficiency whereas nitro (-NO₂) decreases the inhibition efficiency. Electrochemical impedance spectroscopy (EIS) study showed that BNAs acted as interface corrosion inhibitors and polarization study shows they acted as cathodic type corrosion inhibitors. They showed maximum efficiencies of 89.56%, 93.91% and 96.52% for BNA-1, BNA-2 and BNA-3, respectively. The BNAs strongly (high K_{ads} values) and

Download English Version:

<https://daneshyari.com/en/article/7843404>

Download Persian Version:

<https://daneshyari.com/article/7843404>

[Daneshyari.com](https://daneshyari.com)