

Accepted Manuscript

Comparative studies of two benzaldehyde thiosemicarbazone derivatives as corrosion inhibitors for mild steel in 1.0 M HCl

H.H. Zhang, Y. Chen, Z. Zhang

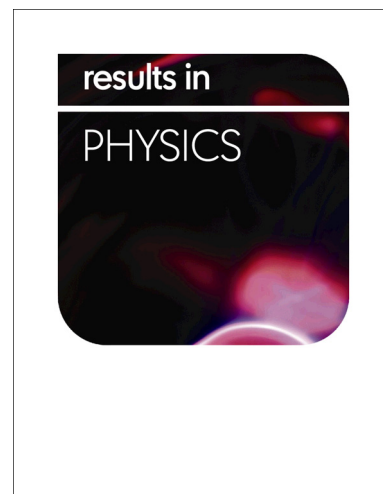
PII: S2211-3797(18)31978-8
DOI: <https://doi.org/10.1016/j.rinp.2018.09.038>
Reference: RINP 1683

To appear in: *Results in Physics*

Received Date: 20 August 2018
Revised Date: 17 September 2018
Accepted Date: 17 September 2018

Please cite this article as: Zhang, H.H., Chen, Y., Zhang, Z., Comparative studies of two benzaldehyde thiosemicarbazone derivatives as corrosion inhibitors for mild steel in 1.0 M HCl, *Results in Physics* (2018), doi: <https://doi.org/10.1016/j.rinp.2018.09.038>

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.



Comparative studies of two benzaldehyde thiosemicarbazone derivatives as corrosion inhibitors for mild steel in 1.0 M HCl

H.H. Zhang ^{a,b*}, Y. Chen ^{a*}, Z. Zhang ^b

^a Department of Chemical Engineering and Safety, Binzhou University, Binzhou, Shandong 256600, China

^b Department of Chemistry, Zhejiang University, Hangzhou, Zhejiang 310027, China

Abstract

Two benzaldehyde thiosemicarbazone derivatives namely 3-methoxy,4-hydroxyl-benzaldehyde thiosemicarbazone (MHBT) and 2-hydroxyl,3-methoxy-benzaldehyde thiosemicarbazone (HMBT) were synthesized and their inhibition behavior for mild steel in 1.0 M HCl solution was investigated using gravimetric measurements and electrochemical tests. Weight loss measurements suggested that these two compounds acted as efficient inhibitors for mild steel in 1.0 M HCl solution and the inhibition efficiency reached a maximum value of 96.1% and 95.7% for HMBT and MHBT, respectively. Potentiodynamic polarization results revealed that both of these two compounds were mixed-type inhibitors. Scanning electron microscopy and energy dispersive spectrum were performed to confirm the presence of benzaldehyde thiosemicarbazone derivatives on mild steel surface. The adsorption of these two inhibitors on mild steel surface in 1.0 M HCl solution follows the Langmuir adsorption isotherm. Correlation between the molecular structure and inhibition property were also discussed using quantum chemical calculations.

Keywords: mild steel; acid corrosion; inhibitor; EIS; quantum chemical calculation

* Corresponding author. Tel: 86-13857182346, E-mail: chen123yu123@163.com (Y. Chen); bzuzhanghong@163.com (H.H. Zhang)

Download English Version:

<https://daneshyari.com/en/article/11032080>

Download Persian Version:

<https://daneshyari.com/article/11032080>

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