

Accepted Manuscript

Title: Exopolysaccharide produced by *Vibrio neocaledonicus* sp. as a green corrosion inhibitor: production and structural characterization

Authors: Masoumeh Moradi, Zhenlun Song, Tao Xiao

PII: S1005-0302(18)30138-5
DOI: <https://doi.org/10.1016/j.jmst.2018.05.019>
Reference: JMST 1270

To appear in:

Received date: 17-11-2017
Revised date: 19-2-2018
Accepted date: 30-3-2018

Please cite this article as: Moradi M, Song Z, Xiao T, Exopolysaccharide produced by *Vibrio neocaledonicus* sp. as a green corrosion inhibitor: production and structural characterization, *Journal of Materials Science and Technology* (2018), <https://doi.org/10.1016/j.jmst.2018.05.019>

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.



Exopolysaccharide produced by *Vibrio neocaledonicus* sp. as a green corrosion inhibitor: production and structural characterization

Masoumeh Moradi¹, Zhenlun Song^{1*}, Tao Xiao^{1,2}

¹Key Laboratory of Marine Materials and Related Technologies, Zhejiang Key Laboratory of Marine Materials and Protective Technologies, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo 315201, China

² College of Materials Science and Engineering, Taiyuan University of Technology, Taiyuan 030024, China

[Received 17 November 2017; Received in revised form 19 February 2018; Accepted 30 March 2018]

***Corresponding author.** Tel: +86 574 87911131; Fax: +86 574 86685159.

E-mail address: songzhenlun@nimte.ac.cn (Z. Song).

Abstract:

An exopolysaccharide substances produced by *Vibrio neocaledonicus* sp. was introduced as a novel green inhibitor against the corrosion of carbon steel in artificial seawater and acidic media. The produced extracellular polymeric substance (EPS) is heterogeneous with composition of polysaccharides, nucleic acids and protein and average molecular weight of 29,572 Da. Adsorption of EPS on the metal surfaces and formation of Fe-EPS complexes acted as a barrier to prevent the oxygen penetration and hindered anodic and cathodic reactions. The inhibitory effect increases with increasing EPS concentration and exposure time. The highest corrosion inhibitory effect (95.1%) was observed for 10 g/L of EPS after 5 days of exposure in seawater. This is the highest inhibitory effect ever been reported by EPSs. While, the optimum concentration of EPS with the highest inhibition efficiency in 1 N H₂SO₄ was 1000 ppm. The influence of different parameters, such as initial pH, growth phase, various nitrogen and carbon sources on the production of EPS and its corrosion inhibitory effect were also investigated.

Download English Version:

<https://daneshyari.com/en/article/8955416>

Download Persian Version:

<https://daneshyari.com/article/8955416>

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