Accepted Manuscript

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K.K. Anupama, K. Ramya, Abraham Joseph

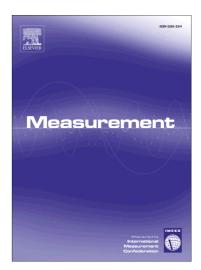
PII: S0263-2241(16)30578-4

DOI: http://dx.doi.org/10.1016/j.measurement.2016.10.030

Reference: MEASUR 4392

To appear in: *Measurement*

Received Date: 13 October 2015 Revised Date: 6 September 2016 Accepted Date: 11 October 2016



Please cite this article as: K.K. Anupama, K. Ramya, A. Joseph, Electrochemical measurements and theoretical calculations on the inhibitive interaction of *Plectranthus amboinicus* leaf extract with mild steel in hydrochloric acid, *Measurement* (2016), doi: http://dx.doi.org/10.1016/j.measurement.2016.10.030

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CCEPTED MANUSCRIPT

Electrochemical measurements and theoretical calculations on the inhibitive interaction of

Plectranthus amboinicus leaf extract with mild steel in hydrochloric acid.

Anupama K K, Ramya K and Abraham Joseph*

Department of Chemistry, University of Calicut, Calicut University PO, Kerala, India.

Email drabrahamj@gmail.com

Abstract

The corrosion inhibition property of *Plectranthus amboinicus* leaves extracts for mild steel in HCl has

been studied using EIS and potentiodynamic polarization techniques. Two main constituents of the

leaf thymol and 1, 8-cineole were also monitored for their inhibition behaviour, both in the individual

form and in combination with each other. EIS studies revealed that the dried and fresh leaf extracts of

PA (PADE and PAFE) show fairly good inhibition efficiencies (upto 98 % for PADE and 93 % for

PAFE) in the studied system. Potentiodynamic polarization studies revealed the mixed type inhibition

behaviour of the extracts. The synergism studies and theoretical calculations done using Gaussian 03

program revealed that the combination of thymol and cineole exhibited enhanced inhibition efficiency

compared to the individual forms. The weight loss measurements also revealed the inhibition potential

of the extracts. The mode of adsorption of the extracts was found obeying Langmuir isotherm.

Key words: Acid solutions; EIS; Acid corrosion; Acid inhibition; Polarization

*For correspondence

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