



Journal of Applicable Chemistry

2021, 10 (6): 838-852
(International Peer Reviewed Journal)



Review

A Review of *Gloriosa Superba* Linn Corrosion Prevention of Mild Steel in HCl Media

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Accepted on 16th November, 2021

ABSTRACT

The corrosion inhibition and adsorption behaviour of alcoholic extracts of plants, namely Gloriosa Superba Linn on mild steel surfaces in 1N HCl solution were explored by mass loss with varying contact times, different temperatures, and electrochemical impedance and Tafel tests. According to the polarisation technique, the plant extract acted as a mixed type inhibitor, primarily controlling the anodic reaction. The adsorption of inhibitor caused a structural change at the electrode solution interface, resulting in mild steel dissolving being controlled by the C_{dl} mechanism, according to the EIS analysis. SEM investigation has established the nature of the protective coating produced on the MS surface. The surface coverage numbers were graphed in order to find an adsorption isotherm that suited the data. In the acid media, the plant extract proved to be an effective natural corrosion inhibitor.

Highlights

- The GSL medicinal plants extract acts as an inhibitor for corrosion of mild steel in 1N HCl solution.
- A good agreement was observed between the results of weight loss and electrochemical methods.
- The GSL plants extracts act as a mixed type inhibitor on the metal surface.
- The plant materials contain proteins, tannin, alkaloids, and terpenoids and so forth.
- These compounds are potential acid corrosion inhibitor for many metals.
- The nature of the protective layer formed on the metal surface has been characterized by Scanning Electron Microscopy (SEM).
- The plant extract obey Temkin adsorption isotherm.
- The temperature studies revealed decrease inhibition efficiency with increase temperature which suggests physisorption.

Keywords: Metals, Corrosion test, EIS, SEM.
