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Corrosion Inhibition of Mild Steel in HCl Medium by 2-(3, 4, 5-Trimethoxybenzylidene) Hydrazinecarbothioamide

Preethi Kumari P¹, Prakash Shetty^{2*}, Suma A Rao¹

1. Department of Chemistry, Manipal Institute of Technology, Manipal University, Manipal, 576104, **INDIA**
2. Department of Printing and Media Engineering, Manipal Institute of Technology, Manipal University, Manipal, 576104, **INDIA**

Email: prakash.shetty@manipal.edu

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ABSTRACT

The inhibitive effect and adsorption behavior of 2-(3, 4, 5-trimethoxybenzylidene) hydrazine carbothioamide (TMBHC) on the corrosion behaviour of mild steel in 0.5 M hydrochloric acid solution has been studied by potentiodynamic polarization, electrochemical impedance spectroscopy (EIS) in the temperature range 30° C – 60° C. The study reveals that the inhibition efficiency increases with increase in inhibitor concentration and with increase in temperature. TMBHC showed maximum inhibition efficiency in the range 90-95 % at optimum concentration of TMBHC at all the studied temperatures. The Tafel polarization results indicate that TMBHC acted as a mixed type of inhibitor. The adsorption of TMBHC on the metal surface takes place predominantly through Chemisorption and follows Langmuir's adsorption isotherm. The thermodynamic parameters and activation parameters were evaluated and discussed. The surface morphology was studied by Scanning electron microscopy (SEM).

Keywords: Mild steel, corrosion, Tafel polarization, Electrochemical impedance, Chemisorption.
