



**Thiophene Derivatives as Corrosion Inhibitors
for CS in 0.5 M H₂SO₄ Solutions**

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ABSTRACT

Some thiophene derivatives were tested as corrosion inhibitors for CS (CS) in 0.5 M H₂SO₄ at room and higher temperatures. Different methods were used to determine the protection efficiency (PE), such as weight loss (WL), potentiodynamic polarization (PP), electrochemical impedance spectroscopy (EIS) and electrochemical frequency modulation (EFM). The results showed the variation in inhibition performance of the inhibitors with varying doses and temperatures. The maximum efficiency was found to be 91 % at 2x10⁻⁴ M of the inhibitors for the immersion period of 3 hours. Langmuir was tested to describe the adsorption behavior of inhibitor on CS surface. PP study clearly revealed that these compounds act as mixed type inhibitors. The results of the EIS study showed a decrease in double layer capacitance (C_{dl}) and increase in charge transfer resistance (R_{ct}). The results of various electrochemical techniques show good agreements with each other and with WL method.

Keywords: Thiophene derivatives, Corrosion inhibition, H₂SO₄, CS, PP, WL, EIS, EFM.
