

Thermodynamic Properties of 5-(4'-isopropylbenzylidene)-2,4-dioxotetrahydro-1,3-thiazole as a Corrosion Inhibitor for Copper in Acid Solution

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5-(4'-isopropylbenzylidene)-2,4-dioxotetrahydro-1,3-thiazole, (*IPBDT*) was tested as a potential copper corrosion inhibitor in 0.1 mol dm⁻³ Na₂SO₄ solution at pH=3. Using *dc* polarization measurements and electrochemical impedance spectroscopy (*EIS*) the influence of the inhibitor concentration and temperature on the inhibitor efficiency was investigated. The obtained results suggested that *IPBDT* is a very good copper corrosion inhibitor in given condition, whose efficiency increases with the increase of the thiazole concentration as well as with the increase of temperature. *EIS* results showed that the inhibition effect of the thiazole manifests through an increase of the total resistance and a decrease of the double layer capacitance compared to the blank solution. The kinetic and thermodynamic parameters obtained by the polarization measurements, indicated that the copper corrosion in acidic sulfate solution occurs as an endothermic reaction and that the inhibitor molecules protect the copper during their chemisorption on the metal surface following the Langmuir's adsorption isotherm.

Keywords: copper corrosion, thiazole derivative, electrochemical impedance spectroscopy (EIS), polarization measurements

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