Adsorption properties of a thiazole-prymidine derivative on mild steel surface in 0.5M H₂SO₄

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Abstract
In the present work, adsorption properties of a thiazole-prymidine derivative on mild steel surface in 0.5 M H₂SO₄ solutions was investigated employing electrochemical impedance spectroscopy (EIS). The results indicate by increasing the inhibitor concentration from 50 to 200 ppm, charge transfer resistance increase from 10 to 127 ohms.cm²; i.e. 92% inhibition efficiency. Additionally double layer capacitance in the presence of 200 ppm inhibitor is 3.67 times lower than uninhibited condition. In other word by steady replacement of water molecules by inhibitor molecules, the double layer thickness increases 3.67 times. Isotherm adsorption model shows that this component obeys the Langmuir adsorption role and it shows ΔG value of 34.36 KJ/mol for adsorption process. This indicates that the adsorption mechanism is more likely chemical on mild steel surface for this component.

Keywords: EIS, adsorption, inhibitor, acidic corrosion

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