

Corrosion Inhibition of Sabic Iron in Different Media Using Synthesized Sodium N-dodecyl Arginine Surfactant

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Sodium N-dodecyl arginine surfactant (sodium 2-(dodecylamino)-5-guanidinopentanoate) was synthesized and examined as an inhibitor for the corrosion of Sabic iron in acidic (HCl), neutral (NaCl) and alkaline (NaOH) media using different techniques, namely, weight-loss (WL), potentiodynamic polarization (PP) and electrochemical impedance spectroscopy (EIS). Increasing the concentrations of the acidic, neutral and alkaline media increased the corrosion rates of Sabic iron and increased the corrosion rate in the order: HCl >> NaCl > NaOH. It was found that the inhibition efficiency of the inhibitor increased with the concentration of the inhibitor while decrease with raising temperature. The results indicate that the inhibition efficiency of the inhibitor increased in the studied media in the sequence: HCl > NaCl > NaOH. The high inhibition efficiency of arginine surfactant inhibitor was interpreted on the basis of strong adsorption of the inhibitor molecules on the surface of Sabic iron and forming a protective film. The adsorption was found to obey Langmuir adsorption isotherm. The evaluated thermodynamic and kinetic parameters support the mechanism of physical adsorption of the inhibitor. The results obtained from all used techniques are in a good agreement with each others.

Keywords: Sabic iron, corrosion, sodium N-dodecyl arginine surfactant, inhibitor, adsorption.

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