Monotriazoles Derived from Uracil and Thymine as Corrosion Inhibitor for API 5L X52 Steel in 1 M H₂SO₄

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In this study, the corrosion inhibition of monotriazoles derived from uracil and thymine was studied with electrochemical impedance spectroscopy (EIS) on API 5L X52 steel in 1 M H₂SO₄. The addition of compounds diminished the corrosion process of the steel, with MTBU-I and MTBT-Br being the best corrosion inhibition compounds with an η of 91% at 15 ppm. Furthermore, the persistence of the film showed that both compounds are effective up to 48 hours with an η above 90%, and at higher temperatures, the MTBT-Br provides a resistant film over the metallic surface up to 50 °C. Hydrodynamic conditions demonstrated that the MTBT-Br afforded good protection against corrosion up to 100 rpm. According to their Langmuir isotherms, the adsorption process for these molecules is a combination of physisorption and chemisorption. Finally, SEM images show a decrease in the corrosion rate on the metallic surface in the presence of the MTBU-I or MTBT-Br.

Keywords: monotriazoles, API 5L X52, EIS, inhibitor, uracil, thymine

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