The Inhibition Effect of Some Organic Compounds on Corrosion of Brass and Carbon Steel in Aggressive Medium

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The surfactants Triton X100 and Triton A20 were studied as corrosion inhibitors for brass and carbon steel type OL37 in sulfuric acid medium using potentiodynamic polarization measurements, electrochemical impedance spectroscopy (EIS), FT-IR spectroscopy and metallurgical microscopy methods. We suppose that, these surfactants inhibit corrosion of metal electrodes by a protective mechanism can be owed to either the adsorption of inhibitor molecules forming a protective film or obtaining a insoluble compound and repairing the porous oxide layers. Experimental data showed that these surfactants achieved a significant inhibiting effect on brass and carbon steel corrosion and act that a mixed inhibitor. The adsorption of the non-ionic surfactants on the electrodes surface obeys to the Langmuir isotherm model. The temperature influence on the corrosion behaviour of the metal electrode in 0.5M H₂SO₄ with and without the inhibitor at 100 ppm and 800ppm was analyzed in the temperature domain from 293 to 313 K. The negative value of thermodynamic parameter like Gibbs free energy of adsorption shows the spontaneity of adsorption process. The experimental results indicate that these inhibitors established its corrosion protection ability. The best effectiveness is achieved at the inhibitor concentration of 100ppm for the system Triton X100/OL 37 and 800ppm for Triton A20/brass.

Keywords: organic inhibitor, brass, carbon steel, electrochemical methods, FT-IR spectroscopy

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