Effectiveness of Some Organic Compounds as Corrosion Inhibitors for Stainless Steel 201 in 1M HCl: Experimental and Theoretical Studies

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The corrosion inhibition of stainless steel 201 (SS 201) in 1M HCl in the existence of organic compounds (OC's) has been studied utilizing electrochemical tests (AC impedance (EIS), electrochemical frequency modulation (EFM), potentiodynamic polarization (PP)) and chemical tests (mass loss (ML)). The inhibition efficiency (IE) rises by increasing concentrations of testing compounds and lowered by raising the temperature. The obtained data exposed that this OC's adsorbed on the SS 201 surface following Langmuir isotherm. PP results showed that these organic compounds are mixed kind inhibitor. The surface analysis of the inhibited SS 201 was estimated by Fourier transform infrared spectroscopy (FTIR) and atomic force microscopy (AFM). The outcome data obtained from all tests are in best agreement.

Keywords: Corrosion inhibition, SS 201, HCl, PP, AFM, FTIR

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