Investigation of Inhibition Effect of Ketoconazole on Mild Steel Corrosion in Hydrochloric Acid

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Inhibition behavior of a common drug Ketoconazole with IUPAC name as (1-[4-(4-[(2*R*,4*S*)-2-(2,4-Dichlorophenyl)-2-(1*H*-imidazol-1-ylmethyl)-1,3-dioxolan-4-yl]methoxy}phenyl)piperazin-1-yl]ethan-1-one) was investigated for mild steel corrosion using weight loss, electrochemical impedance spectroscopy (EIS), potentiodynamic polarization and theoretical methods. The surface was observed through scanning kelvin probe (SKP), atomic force microscopy (AFM), and scanning electron microscopy (SEM). The drug showed the maximum efficiency of 97% at 100 ppm through weight loss method, 93% through polarization method and 94% through EIS method. The equal relocation of the anodic and cathodic regions indicated that the drug belong to mixed type inhibitor category. Theoretical computations in addition to the experimental results supported the protective action of inhibitor on the mild steel surface due to adsorption.

Keywords: Ketoconazole, SKP, DFT, EIS, Polarization, AFM, Inhibitor

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