Corrosion Inhibition Efficiency of Expired Nitazoxanide Drug on Carbon Steel in Hydrochloric Acid Solution

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The corrosion inhibition of the expired Nitazoxanide drug was investigated in inhibiting the carbon steel (CS) corrosion in 1M HCl using chemical method (weight loss (WL)), two electrochemical test (potentiodynamic polarization (PP) and electrochemical impedance spectroscopy (EIS) techniques) combined with surface analysis. The results show that the expired Nitazoxanide drug are effective and attain their action as mixed type corrosion inhibitors, and their corrosion inhibition affinities were increase with the rising of their concentration and lower temperature. The adsorption of the expired Nitazoxanide drug on the CS surface was obeyed Langmuir isotherm. The adsorption thermodynamic parameters calculated show that the adsorption was a spontaneous, endothermic process accompanied by an increase in the entropy. The maximum data of the inhibition approached to 90% within the presence of 300 ppm expired Nitazoxanide drug using potentiodynamic polarization process. The results of surface analysis and the electrochemical technique were in a great agreement

Keywords: Acid corrosion, C-steel, SEM, AFM, FTIR, Adsorption, Nitazoxanide drug

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