Inhibitor Effect of N-(5-((4-chlorophenyl)diazenyl)-2-hydroxybenzylidene)-2-hydroxy benzohydrazide for Mild Steel Corrosion in chloride and sulphate acidic solutions

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Corrosion resistance of N-(5-((4-chlorophenyl)diazenyl)-2-hydroxybenzylidene)-2-hydroxybenzohydrazide (CDHBHZ) in reducing mild steel (MS) corrosion in 1M hydrochloric acid (HCl) and 0.5M sulphuric acid (H₂SO₄) were examined by Electrochemical and Chemical techniques. The results from mass loss analysis revealed that the corrosion rate of MS enhanced when the temperature was raised from 308K to 328K. It is noted that in the acidic solutions, the dissolution rate of MS reduced with raise in the concentration of CDHBHZ (0.01- 0.03M) and it resulted in higher inhibition rate in HCl than H₂SO₄ solution. The diameter of the semicircle increased as the amount of CDHBHZ increased, as shown by the Nyquist plots. The protection efficacy of CDHBHZ was 96.00 % (1M HCl) and 89.00% (0.5 H₂SO₄) at the ideal CDHBHZ concentrations. CDHBHZ functions as a comprehensive inhibitor that predominantly inhibit corrosion at anodic site, according to Polarization studies. The IR spectroscopic analysis confirms the functional groups in the CDHBHZ and the formation of inactive thin films on MS surface. The adsorption of CDHBHZ on the MS follows Langmuir model, according to Thermodynamic and adsorption studies.

Keywords: Alloys, Hydrazone, Corrosion reduction rate, Chemical analysis, Langmuir model.

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