

Use of Curcuma and Curcumin as a Green Corrosion Inhibitors for carbon Steel in Sulfuric Acid

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The use of *Curcuma* (*Curcuma longa* L.) extract as a green corrosion inhibitor for 1018 carbon steel in 0.5 M H₂SO₄ solution has been evaluated by using weight loss tests, potentiodynamic polarization curves and electrochemical impedance spectroscopy measurements. Results have shown that *Curcuma longa* L. decreased the weight loss by one and the corrosion current density values by two orders of magnitudes. Results of free energy suggest physical adsorption on to the steel surface obeying a Langmuir type of adsorption isotherm. Polarization studies give evidence that *Curcuma longa* L. extract behaves as a predominantly cathodic type of inhibitor, and its efficiency increases with increasing its concentration, reaching a maximum value of 90%.

Keywords: Carbon steel, acid corrosion, green inhibitor.

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