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Tilia Leaves as Eco-Friendly Corrosion Extract for MS in Aqueous Solutions

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ABSTRACT

Tilia Leaves extract investigated as a green corrosion extract for MS (MS) in 1M HCl using mass loss (ML), Tafel polarization (TP), electrochemical impedance spectroscopy (EIS) and electrochemical frequency modulation (EFM) methods. The obtained results showed that Tilia Leaves extract is an excellent corrosion extract. The inhibition efficiency (ω) increases with increasing the temperature from 25 to 45°C, reaching a maximum value of 79 % at 300 ppm at the temperature of 45°C. Polarization measurements demonstrate that the Tilia Leaves extract acts as a mixed type extract. Nyquist plot illustrates that on increasing Tilia Leaves extract dose, the charge transfer increases (R_{ct}) and the double layer capacitance (C_{dl}) decreases. The adsorption of Tilia Leaves extract on MS obeys Temkin adsorption isotherm.

Keywords: MS, HCl, Corrosion inhibition, Tilia Leaves extract, EIS, EFM.