

Corrosion Inhibition of Low Carbon Steel by *Strychnos nux-vomica* Extract as Green Corrosion Inhibitor in Hydrochloric Acid Solution

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In this study, the inhibition action of *Strychnos nux-vomica* extract on the corrosion of carbon steel in 4 % and 8 % HCl solution has been investigated in different temperatures. For this purpose, the methods of weight loss, electrochemical impedance spectroscopy (EIS) and potentiodynamic polarization were used for investigation of performance of *Strychnos nux-vomica* extract in ambient temperature, while potentiodynamic polarization method was also used at different temperatures to define the effect of temperature on the inhibition efficiency of *Strychnos nux-vomica* extract. The obtained results demonstrate that inhibition efficiency in both media increased with increasing concentrations and decreases with increasing temperature. The polarization curves revealed that *Strychnos nux-vomica* extract represent mixed-type behavior in both 4 % and 8 % HCl solution. At all temperatures, the adsorption of the extract components onto the steel surface was followed Langmuir adsorption isotherm. Quantum chemical calculations were done to predict the adsorption of main components of *Strychnos nux-vomica* extract on the metal surface.

Keywords: Carbon steel; Weight loss; EIS; Polarization; Acid corrosion; *Strychnos nux-vomica* extract.

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