Corrosion inhibition and adsorption characteristics of camel foot leaves extracts on mild steel in hydrochloric acid solution

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Abstract.
Inhibitive performance of Camel foot (Piliostigma thonningii) leave extract was investigated on corrosion of mild steel in 1.5M hydrochloric at different temperature (25^{o}C to 60^{o}C) using weight loss and hydrogen evolution measurement. Phytochemical screening was carried out on the extract and characterized with Gas Chromatography Mass Spectrometer (GCMS) and Fourier Transformation Infrared (FTIR) analyses. The results obtained showed Camel foot leaf extract (CFLE) contained phytochemical compounds with an important functional groups that inhibit corrosion. It was found that the study plant extract exhibit an excellent inhibitive abilities on corrosion of mild steel in acidic medium. The inhibition efficiency obtained from weight loss and hydrogen evolution measurement at 60^{o}C with addition of 0.5 g/l concentration of CFLE was 64.08% and 62.12% respectively. This shows there was good agreement between the results obtained for both methods adopted. At all investigated temperature, the adsorption of the studied inhibitor obeys' Langmuir adsorption isotherm. The results of thermodynamic adsorption parameters ($\Delta H_{ads}, \Delta S_{ads}, \Delta G_{ads}$) showed that the studied inhibitor is adsorbed on mild steel surface by physical adsorption mechanism, accompanied with an exothermic reaction and spontaneous process.

Keywords: Camel foot; Mild steel; Phytochemical compounds; Inhibition performance.

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