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## Corrosion inhibition of mild steel in formic acid and citric acid using tamarind (*Tamarindus indica*) extract

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Organic and inorganic compounds have been widely used as corrosion inhibitors in metal or metallic-alloys. Research has shown that some of the compounds used are toxic and harmful to human health and the environment. Therefore, green chemicals are used as a substitute for the toxic chemicals. In this research, adsorption and thermodynamics of corrosion inhibition on mild steel has been carried out in Citric acid and Formic Acid solutions using *Tamarindus indica*. The inhibitive properties of ethanolic extracts of *Tamarindus indica* on mild steel in Formic and Citric acid solutions were investigated using the weight loss techniques. Mild steel was immersed in three different concentrations of the two acids (formic and citric acid) in blank, 0.1 g/100 ml and 0.3 g/100 ml concentrations of the extract. All these three different concentrations were studied within the temperatures of 30°C and 45°C. The results obtained illustrate that the inhibition efficiency increases with increase in concentration and temperature. Increase in inhibition efficiency with increase in temperature suggests the mechanism to be chemisorption. The optimum inhibition efficiency was 78.3 in 3 g/100 ml of citric acid at 45°C (318K). The heat of absorption was found to be positive, hence endothermic. Adsorption studies were carried out using Temkin, Flory- Huggins, and Langmuir isotherms. From the results obtained, the data fits the Langmuir adsorption isotherm.

### Biography

Linus N Okoro is lecturing at the American University of Nigeria as an Associate Professor and the chair of petroleum chemistry department. He obtained his PhD in Physical Chemistry from the Dortmund University of Technology, Germany. He has published more than 20 papers in reputed journals.

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