

## Comparative studies of inhibitive properties of *Ficus polita* and *Ficus platyphylla* on corrosion inhibition of mild steel in acidic medium

Christiana Agbenu ADAH\*, Sylvester Obaike ADEJO, Joseph Aondoaver GBERTYO, and Andrew Adah OGWUCHE

*Department of Chemistry, Benue State University, Makurdi Nigeria*

**Abstract.** The menace of corrosion of steel in industries has been widely acknowledged. Analysis of oil pipeline failures in oil and gas industries in the Niger Delta area of Nigeria showed corrosion as one of the major causes of failure. Eco-friendly, cheap and renewable materials such as plant extracts have been investigated as alternative to the use of expensive synthetic chemicals which are often hazardous. In this study inhibitive properties of ethanol extracts of *Ficus polita* and *Ficus platyphylla* leaves as eco-friendly inhibitors of mild steel in 2 M sulfuric acid solution were investigated by weight loss method at temperatures of 301, 305, 309 and 313 K. The study has shown that both plant extracts inhibited the corrosion of mild steel in the acid medium. The inhibition efficiency (*IE*) and surface coverage ( $\theta$ ) for both extracts increased with increase in concentration and temperature. This trend is suggestive of chemical adsorption. However, the leaf extract of *Ficus polita* showed higher *IE* compared to *F. platyphylla*. Thermodynamic parameters and apparent activation energy obtained from the studies revealed the inhibition by both plant extracts to be spontaneous, exothermic and chemisorptive, while the adsorption mechanism of both plant extracts on the steel surface aligned with the Freundlich isotherm model, *F. polita* fits well to Temkin and Adejo-Ekwenchi isotherm models in addition.

**Keywords:** steel corrosion; weight loss; thermodynamics; *Ficus polita*; *Ficus platyphylla*; adsorption model.

\* Corresponding author. *E-mail address:* christieadah5@gmail.com (Christiana Agbenu Adah)