Int. J. New. Chem., 2022, Vol. 9, Issue 3, pp. 409-421.

International Journal of New Chemistry

Published online in http://www.ijnc.ir/

Open Access

Print ISSN: 2645-7237

Online ISSN: 2383-188x

Original Research Article

Analysis of Corrosion Inhibiton Potential of Acacia nilotica Fruits on Aluminium Corrosion in Acidic and Alkaline Media

Abdul Sani Usman*, Ibrahim Muhammad Bashir, Ibrahim Muhammad Adamu.

Department of Pure and Industrial Chemistry, Bayero University, Kano

Received: 2021-01-01 *Accepted: 2021-11-19* *Published: 2022-01-15*

ABSTRACT

In this study, the inhibitive action of *Acacia nilotica* fruits powder towards the corrosion behavior of aluminium in 1.0M HCl and 1.0M NaOH solutions has been studied without carrying out any solvent extraction of the fruits powder using weight loss method. *Acacia nilotica* showed corrosion inhibition efficiency of 98.83 and 71.64% in HCl and NaOH respectively in the presence of 0.5% w/v inhibitor concentration at 318K. The activation energy increases from that of the blanks (23.84 and 49.25 kJmol^{-1}) to the inhibited (55.92 and 65.92 kJ mol^{-1}) in HCl and NaOH respectively. The adsorption process was spontaneous as indicated by the large negative values of ΔG and ΔS. The values of enthalpy were positive indicating endothermic process of adsorption. The adsorption of *Acacia nilotica* on aluminium was best fitted to Langmuir adsorption model in both media. The result of FTIR Spectra also indicated physisorption mechanism as proposed by the thermodynamic data.

Keywords: Corrosion Inhibition, Acacia Nilotica, Solvent Extraction, Activation Energy, Enthalpy, Thermodynamics

***Corresponding Author: Tel.: 07061547007**
E-mail: sanidanmaraya@gmail.com