

***Lepidagathis alopecuroides* methanol extract as corrosion inhibitor for mild steel in HCl**

Gloria I. NDUKWE,¹ Habibat F. CHAHUL*,² and Godwin OODO²

¹*Department of Chemistry, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Rivers State, Nigeria*

²*Department of Chemistry, Federal University of Agriculture, Makurdi, Nigeria*

Abstract. We report on the preliminary phytochemical screening of the methanolic extract of the aerial parts of *Lepidagathis alopecuroides* and its evaluation as a potential corrosion inhibitor for mild steel in aerated 1.0 M HCl by weight loss and linear polarization measurements. Weight loss measurements were conducted at 303, 313, 323 and 333 K. The results showed that *L. alopecuroides* inhibited the corrosion of mild steel in the acid solution with inhibition efficiency increasing with increase in the concentrations of the plant extract but decreased with increase in temperature. Linear polarization plots showed the plant extract to inhibit both the dissolution of the steel at the anode and the hydrogen evolution reaction (HER) at the cathode making it a mixed inhibitor. Temkin adsorption isotherms best modeled the adsorption of *L. alopecuroides* extract on the steel surface. From the values of the evaluated kinetic activation parameters in the study, the mechanism of physisorption is proposed for the adsorption of the plant extract on the steel surface.

Keywords: mild steel; corrosion inhibitor; linear polarization; activation energy; adsorption isotherm.

*Corresponding author. *E-mail addresses:* momohbat2007@gmail.com; chahul.hf@uam.edu.ng (H.F. Chahul)