Studies on Caladium Tricolor Stem and Leaf Biomass extract as corrosion inhibitor for mild steel in acidic media

ABSTRACT

Biomass extract from the stem (CSE) and the leaves (CLE) of caladium tricolor were characterized by Fourier transform infrared spectroscopy and Gas chromatography-mass spectrometry. The CSE and CLE extracts were investigated for their corrosion inhibition efficacy and surface protection capability for mild steel under acidic conditions. The influence of corrosion inhibitor concentration, temperature, and immersion time, on inhibition efficiency was evaluated using the gravimetric methods and potentiodynamic polarization methods. Inhibition efficacy for both inhibitors was dependent on concentration, temperature, and time, increasing with increase in concentration and decreasing with increase in time of immersion and temperature of the system. Maximum inhibition efficiency of 98.92 % was obtained for CSE and 88.92 % for CLE at a concentration of 20 ml respectively after 24 hours of immersion. The activation energy associated with this process indicated surface interaction as the main mechanism and positive values of enthalpy change confirmed the endothermic nature. The electrochemical parameters were calculated, and the inhibitor was found to be mixed type. The adsorption of CSE and CLE on the metals was established by Fourier transform infrared spectroscopy and atomic force microscopy.