Green coffee bean extract as a green corrosion inhibitor for aluminium in artificial acid rain medium

ABSTRACT

The work investigates the extract of the green coffee bean as a green corrosion inhibitor for aluminum in the artificial acid rain at different temperatures. Corrosion rate, degree of surface coverage, and inhibition efficiency were determined using electrochemical measurement (Tafel polarization). The results revealed that the green coffee bean extract served as a good inhibitor for reducing corrosion attack of aluminum in the tested medium. In addition, the inhibition efficiency reached maximum level at 8.0 g/L of 84.4, 97.4 & 98.1% for 300, 313, & 323 K, respectively. The findings proved that the Langmuir isotherm was the best model for the adsorption on the tested metal. ANOVA test demonstrated that concentration of the green coffee extract plays significant role in corrosion inhibition of aluminum, while there is no significant differences of temperature changes.

Keyword: Green coffee; Eco-friendly; Metal; Acid rain; Adsorption; Polarization