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Corrosion Inhibition of Cu in Nitric Acid Solution using Asafoetida Extract (ASFE) as Green Inhibitor

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ABSTRACT

Asafoetida extract (ASF) was investigated as a green corrosion inhibitor for Cu in 1 M HNO_3 solution using weight loss (WL), potentiodynamic polarization (PP), electrochemical impedance spectroscopy (EIS) and electrochemical frequency modulation (EFM) techniques. Surface morphology was tested using scanning electron microscope (SEM). The effect of the temperature on corrosion behavior with addition of different doses was studied in the temperature range of 25-45 ºC by WL. Polarization curves reveal that the investigated extract is a cathodic behavior. The inhibition efficiency (IE) was found to increase with increase in the investigated extract dose and decrease with increase in solution temperature. The adsorption of the inhibitor on Cu surface was found to obey the Langmuir's adsorption isotherm. The activation and adsorption parameters were calculated and discussed. The results obtained from chemical and electrochemical techniques are in good agreement.

Keywords: Acidic inhibition, Cu, Asafoetida extract (ASF), Green inhibitor, SEM.