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Ethanolamines as corrosion inhibitors for zinc in sulphuric acid

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ABSTRACT

The corrosion of zinc in sulphuric acid containing ethanolamines has been studied at different acid concentrations, inhibitor concentrations and temperatures. Corrosion rate increases with increase in acid concentrations. At constant acid concentration, the inhibition efficiency (I.E.) of ethanolamines increases with inhibitor concentration. Similarly at constant inhibitor concentration, the I.E. increases with the increase in acid concentration. At 60 mM inhibitor concentration in 0.1 M sulphuric acid at 301 K for 24 h immersion period, the I.E. decreases in the order: Ethanolamine (91%) > Diethanolamine (89 %) > Triethanolamine (86 %). As the temperature increases, corrosion rate increases while I.E. decreases. The mode of inhibition action appears to be chemisorptions since the plot of log (θ/1-θ) versus log C gives a straight line suggest that the inhibitors cover both the anodic and cathodic regions through general adsorption following Langmuir isotherm. Galvanostatic polarization curves showed significant anodic polarization.

Keywords: Corrosion, Zinc, Sulphuric acid, Ethanolamines.
