Electrochemical corrosion of low carbon steel in a hydrochloric acid medium

S. Divakara Shetty, author

Abstrak

Inhibition is one of the mechanisms used for mitigating the metallic corrosion, particularly in an acid environment. The present work aims to investigate the inhibiting effect of N-benzyl-N/-phenyl thiourea (BPTU) on the corrosion of low carbon steel in a 0.1 M hydrochloric acid (HCl) solution using a Tafel extrapolation and linear polarization techniques. The study reveals that BPTU acts as an excellent anodic inhibitor for low carbon steel in a HCl solution. The protective efficiency of the compound was found to be more than 97% even at higher temperatures. The study demonstrated that BPTU gets adsorbed on the steel surface, following Temkin’s adsorption isotherm and the inhibition is controlled by a chemisorption mechanism. The investigation shows that the results obtained from the Tafel extrapolation and linear polarization techniques for the corrosion of mild steel in HCl medium were in good agreement. The influence of temperatures and concentrations of BPTU on the corrosion of low carbon steel are also examined in the present work.