

البحث الثاني

Understanding the adsorption performance of two glycine derivatives as novel and environmentally safe anti-corrosion agents for copper in chloride solutions: experimental, DFT, and MC studies.

The inhibition impacts of two non-toxic glycine derivatives, namely, bicine (N,N-bis(2-hydroxyethyl)glycine) and tricine (N-(tri(hydroxymethyl)methyl) glycine) on copper corrosion were investigated in 3.5% NaCl solutions. Surprisingly, there is no report on using bicine and/or tricine as corrosion inhibitors for Cu and its alloys in a seawater-like environment. The effects of bicine and tricine on the corrosion behavior of Cu in 3.5% NaCl were examined using the open circuit potential, Tafel polarization, and AC spectroscopy (EIS) techniques. The corrosion rate decreased as a function of the inhibitor dose. The Tafel and EIS parameters showed that the inhibitors decreased both the anodic and cathodic corrosion currents and inhibited the charge transfer process by adsorption on the Cu surface. The inhibition property as attributed to the adsorption of inhibitor molecules with the Langmuir model. Tricine showed a superior inhibition performance of more than 98% at a concentration of 5 mmol L⁻¹. The free energy of adsorption data revealed physical adsorption. The outcomes of Monte Carlo simulations and theoretical studies well supported the experimental data

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