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Adsorption Behavior of 1H-benzotriazole Corrosion Inhibitor on Aluminum alloy 1050, Mild steel and Copper in Artificial Seawater

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Highlights

- Study adsorption behavior of benzotriazole on aluminum 1050, mild steel and copper.
- Study the effect of hydrodynamic flow and immersion time on persistence of adsorbed layer.
- The physisorption on mild steel and aluminum according to Langmuir and El-Awady isotherm.
- The dominant chemical nature of adsorption on copper according to Longmuir isotherm.

Abstract

The adsorption behavior of 1H-benzotriazole (BTA) corrosion inhibitor on aluminum alloy 1050, mild steel and copper in simulated sea water was investigated using weight loss, electrochemical impedance spectroscopy (EIS) and Tafel polarization measurements. Mixed mode of adsorption was proposed for corrosion inhibition of metals. The adsorption process for mild steel and aluminum followed the Langmuir and El-Awady kinetic-thermodynamic adsorption isotherm in which physisorption nature of adsorption was more dominant. The adsorption of BTA on copper surface obeyed Longmuir isotherm via a dominant chemisorption mechanism. The obtained results clearly revealed that the persistence of adsorbed and