Saccharum Officinarum Leaf Extract as Corrosion Inhibitor of Copper Corrosion in Sulphuric Acid Solution: Experiments and Theoretical Calculations

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Received: 11 July 2021 / Accepted: 30 August 2021 / Published: 10 October 2021

Saccharum officinarum leaf extract was obtained by the ethanol soaking method in this study. Fourier infrared spectroscopy experiments show that Saccharum officinarum leaf extract contains a mass of oxygen or nitrogen-containing functional groups. Electrochemical experiments show that Saccharum officinarum leaf extract can efficaciously suppression the corrosion of Cu at H₂SO₄. Polarization curve test shows that the η of Saccharum officinarum leaf extract can reach more than 93%, and it is a mixed-type corrosion inhibitor. The morphology test indicates that after Saccharum officinarum leaf extract is adsorbed onto the Cu interface, the corrosion rate of the corrosive medium on the copper surface is significantly reduced. Quantum chemical (QC) calculations and molecular dynamics (MD) simulations have shown that Saccharum officinarum leaf extract can efficaciously control the corrosion of Cu at sulfuric acid solution.

Keywords: Saccharum officinarum leaf extract; Corrosion inhibitor; H₂SO₄; Copper; Quantum chemical calculations

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