In-situ Scanning Micro-Electrochemical Characterization of Corrosion Inhibitors on Copper

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In-situ scanning vibrating electrode technique (SVET) combined with other techniques (such as electrochemical impedance spectroscopy (EIS), atomic force microscopy (AFM) and X-ray photoelectron spectroscopy (XPS)) was used to investigate the efficiency of the mixed compound of 3-amino-1, 2, 4-triazole (ATA) and sodium molybdate (SM) as a corrosion inhibitor for copper in 3.5% NaCl solution in comparison with benzotriazole (BTA). The results indicate that copper shows extremely higher corrosion resistance in 3.5% NaCl solution with the presence of ATA-SM inhibitor than BTA. This is due to the reaction of ATA with copper allowing the formation of a thin film incorporated with MoO_4^{2-} ion precipitates on the surface of copper, which provides strong cathodic efficiency and thus is considerably protective.

Keywords: In-situ, SVET, ATA-SM, inhibitor, copper

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