Corrosion Inhibition of Copper and α -Brass in 1 M HNO₃ Solution using New arylpyrimido [5, 4-c] quinoline-2,4-dione derivative

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The efficiency of 5-(3,4-dimethoxyphenyl)-8,10-dimethoxy-1,3-dimethylpyrimido-[5,4-c]quinoline-2,4-dione(PQD) as corrosion inhibitor for Cu and α -brass in 1 M HNO₃ has been tested by weight loss (WL) and electrochemical techniques such as potentiodynamic polarization (PP), electrochemical impedance spectroscopy (EIS) and electrochemical frequency modulation (EFM) techniques. The calculated adsorption thermodynamic parameters indicated that the adsorption was a spontaneous, exothermic process accompanied by a decrease in entropy. The protection efficiency (PE) increases with increasing the dose of the tested organic compound in HNO₃ solution and decreases with increasing the temperature. The adsorption of the PQD on the Cu and α -brass surfaces in the acid solution was found to obey Langmuir's adsorption isotherm. Scanning electron microscope (SEM) results showed the formation of a protective film on the Cu and α -brass surfaces in the presence of PQD. The results obtained from different techniques were in good agreement

Keywords: Copper, α -Brass, Corrosion inhibition, PQD, HNO₃, EIS, EFM, SEM-EDX

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