Available online at www.joac.info

ISSN: 2278-1862

Journal of Applicable Chemistry

2017, 6 (5): 855-867

(International Peer Reviewed Journal)

Inhibition Action of Aprotic Solvents on the Electropolishing of Copper in Ortho Phosphoric Acid

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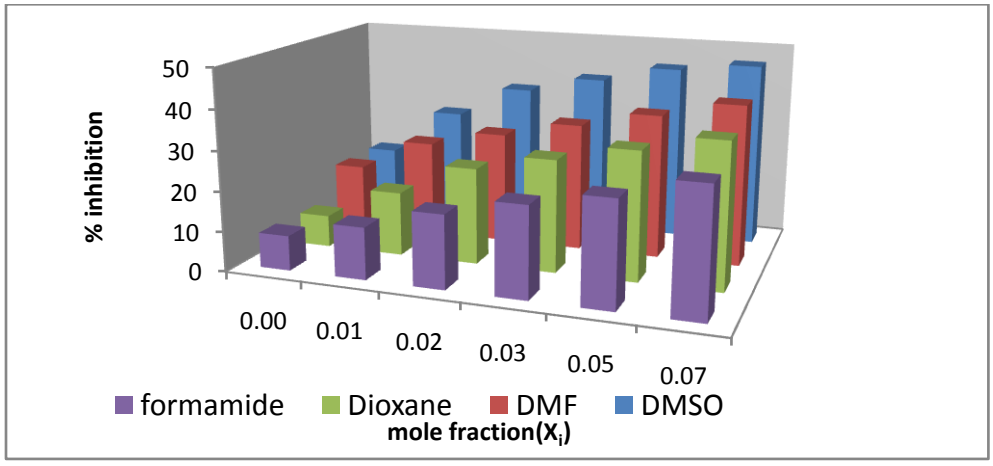
Accepted on 31st August 2017, Published online on 27th September 2017

ABSTRACT

The inhibition action of four aprotic solvents [Dimethyl sulphoxide (DMSO), Dimethyl formamide (DMF), Dioxane and Formamide] on the electropolishing of copper in H_3PO_4 acid has been investigated by Galvanostatic polarization measurements. Aprotic solvents have great dielectric constant and great dipole moment. These solvents not play as hydrogen donors. Then again the focus of negative charge density is typically on extremely basic atoms N or O, which is greatly showing for intermolecular interaction with acidic or positive site. The inhibitive effect was found to range from 8 to 46%. Thermodynamic parameters of adsorption were calculated using some adsorption isotherms. The activation energy and in addition parameters of thermodynamic for protection procedure was measured and discussed. The surface was analyzed after electropolishing (EP) treatment by AFM (Atomic force microscope) and SEM (Scanning electron microscope).

Graphical Abstract:



Keywords: Electropolishing of copper, Aprotic solvents, Galvanostatic