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Physical and electrochemical properties of Ni/Mo thin film deposited at different electroplating current density

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Abstract

In this work, electrodeposition technique has been used to codeposit molybdenum particles in nickel matrix as protective film against corrosion attacks, in addition the effect of electroplating current density on different properties of Ni/Mo thin films has studied. The numerous technique used to study the differents properities of Ni/Mo thin films showed that, this films were observed to be fissured and porous in morphology. The main phases identified in different exposed films are MoNi_4 , Ni_3Mo and $\text{Mo}_{1,24}\text{Ni}_{0,76}$. The effect of applied current density on electrochemical properties was studied. Inhibitory efficiency of gum arabic was controlled by the electroplating current density by testing the intensification of hydrogen reaction of this thin films using EIS technique. Moreover, this work gives a solution to the corrosion of crude oil desalter by electroplating Ni-Mo films and then injecting a small amount of gum arabic in the oil pipeline before disasement, which gives long life to the reactor.

Keywords

Nickel

Arabic gum

Co-deposition

EIS

Molybdenum