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Codeposition of electroless Ni-P/ZnO nano composites and evaluation of corrosion resistance of the coatings

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Abstract

Codeposition of nano ZnO with Ni-P coatings was carried out on 99% pure copper substrates. The ZnO nano particles were prepared by simple Sol-Gel method using Zinc acetate dihydrate as precursor. The particle size of the same was found to be <100 nm. The process optimization for codeposition of nano ZnO with Ni-P coatings was carried out by varying the composition of nano ZnO particles using ultrasonicator. An adherent and uniform coating of Ni-P/ZnO was obtained. Presence of ZnO in the coatings was confirmed by EDAX. Surface morphology of the coatings was studied by SEM which shows the smooth homogenous surface in Ni-P/ZnO composite coating. Corrosion resistance of the coatings was evaluated by Salt spray test and Galvanostatic Polarization method using 5% NaCl solution. Corrosion resistance of the Ni-P and Ni-P/ZnO nano composite coatings were compared. Incorporation of nano ZnO in the coatings found to enhance the corrosion resistance and microhardness of the coatings.

Keywords:

Codeposition, Sol-gel process, Electroless, TGA, Polarization, Salt spray test

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