

Experimental Investigation on the Effects of Electroless Nickel Phosphorus Deposition, pH and Temperature with the Varying Coating Bath Parameters on Impact Energy by Taguchi Method

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Abstract : This paper discusses the effects of sodium hypophosphite concentration, pH, and temperature on deposition rate. This paper also discusses the evaluation of coating strength, surface, and subsurface by varying the bath parameters, percentage of phosphate, plating temperature, and pH of the plating solution. Taguchi technique has been used for the analysis. In the experiment, nickel chloride which is a source of nickel when mixed with sodium hypophosphite has been used as the reducing agent and the source of phosphate and sodium hydroxide has been used to vary the pH of the coating bath. The coated samples are tested for impact energy by conducting impact test. Finally, the effects of coating bath parameters on the impact energy absorbed have been plotted, and analysis has been carried out. Further, percentage contribution of coating bath parameters using Design of Experiments approach (DOE) has been analysed. Finally, it can be concluded that the bath parameters of the Ni-P coating will certainly influence on the strength of the specimen.

Keywords : bath parameters, coatings, design of experiment, fracture toughness, impact strength

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