



Experimental and Analytical Investigation of Electrodeposited Ni-Al₂O₃ Composite Coatings

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Abstract: Electrodeposited composites are gaining importance for their advantages including low cost, ease and simplicity of operation. Composite electroplating is a method of co-depositing fine particles of metallic, nonmetallic compounds or polymers in the plated layer to improve material properties such as wear resistance, hardness, lubrication, or corrosion resistance. Electrodeposition has been identified to be a technologically feasible and for many applications, economically superior technique for the production of nanocrystalline materials. With increasing availability of micron-sized particles of Al₂O₃, there is growing interest in the electrolytic and electro less co-deposition of these particles. In this research work an attempt is made to produce electrodeposited Ni – Al₂O₃ coating on a mild steel substrate by electroplating process. By adjusting the plating parameters such as current density, pH value of the electrolyte bath, amount of Al₂O₃ particles in bath, agitation speed and temperature of the bath, electroplating is carried out for the investigation. The mass of deposit for various Ni- Al₂O₃ composite coated specimens at different plating parameters are measured experimentally. The plating parameters and their mass of the effects on the deposited coatings were investigated by using neural networks technique.

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