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Modelling and Optimization of Copper Electroplating Adhesion Strength (Conference Paper)

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Abstract

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In this paper, Response surface methodology (RSM) was utilized to design the experiments at the settings of $CuSO_4$ and H_2SO_4 concentrations and current densities. It also used for modelling and optimize the parameters on the adhesion strength of austenitic stainless steel substrate. The adhesion strength was investigated by the Teer ST-30 tester, and the structure of the samples investigated by using scanning electron microscopy (SEM). The modelling approach adopted in the present investigation can be used to predict the adhesion strength of the copper coatings on stainless steel substrate of electroplating parameters in ranges of $CuSO_4$ 100 to 200 g / L, H_2SO_4 100 to 200 g / L and current density 40 to 80 mA / cm^2. The results showed that, operating condition should be controlled at 200 g/L CuSO4, 100 g/L H2SO4 and 80 mA/cm^2, to obtain the maximum adhesion strength 10N. © Published under licence by IOP Publishing Ltd.

Indexed keywords

Engineering controlled terms: Adhesion, Austenitic stainless steel, Bond strength (materials), Copper, Electroplating, Nanostructured materials, Scanning electron microscopy

Austenitic stainless
Copper coatings
Copper electroplating
Operating condition
Response surface methodology
Stainless steel substrates

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