

PROCESS AND PRODUCT TECHNOLOGY

任意可调Zn-Co合金镀层的电沉积

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摘要 The effects of pulse parameters on the cobalt content, surface morphologies and grain size of Zn-Co alloy deposits were studied using a pulse plating technique with a square-wave current containing reverse pulse. Average current density and reverse anodic current density amongst the variables investigated have very strong effects on the cobalt content in the Zn-Co alloy deposits. Grain size, surface appearance and internal stress in the deposit were improved significantly by introducing the reverse current. Varieties of Zn-Co alloy compositionally modulated multilayer (CMM) coatings with large differences in cobalt contents for different sublayers were electrodeposited by designing corresponding waveforms using a computer-aided pulse plater and characterized in terms of surface morphologies. Cross-sectional morphologies of the Zn-Co alloy CMM coatings, examined using field emission gun scanning electron microscopy (FEGSEM), confirmed the layered structure.

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Electrodeposition of Compositionally Modulated Zinc-cobalt Alloy Multilayer Coatings

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Abstract The effects of pulse parameters on the cobalt content, surface morphologies and grain size of Zn-Co alloy deposits were studied using a pulse plating technique with a square-wave current containing reverse pulse. Average current density and reverse anodic current density amongst the variables investigated have very strong effects on the cobalt content in the Zn-Co alloy deposits. Grain size, surface appearance and internal stress in the deposit were improved significantly by introducing the reverse current. Varieties of Zn-Co alloy compositionally modulated multilayer (CMM) coatings with large differences in cobalt contents for different sublayers were electrodeposited by designing corresponding waveforms using a computer-aided pulse plater and characterized in terms of surface morphologies. Cross-sectional morphologies of the Zn-Co alloy CMM coatings, examined using field emission gun scanning electron microscopy (FEGSEM), confirmed the layered structure.

Key words [zinc-cobalt alloy](#); [electrodeposition](#); [compositionally modulated multilayer coating](#)

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