

Magnetic Films of Cobalt/Zinc Electrodeposited from Ternary Zinc Chloride-Dimethylsulfone-Cobalt Chloride Molten Salt

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Abstract

The electrodeposition of magnetic films of Co/Zn in the $\text{ZnCl}_2\text{-DMSO}_2$ solvents have been studied with added CoCl_2 as the molten salt electrolytes. The phase diagram of binary $\text{ZnCl}_2\text{-DMSO}_2$ melts was determined by DSC and TGA analysis. The phase diagram of this system can be used as the reference data for the determining conductivities and densities. The various composition of alloys with different deposition potentials on electrode surface has been studied by cyclic voltammetry. Pulse potential plating were used to electrodeposited Co/Zn thin films and the surface morphologies and magnetic properties have been studied with the SEM, AFM, MFM and VSM. It was shown that the compact and needle Co/Zn thin films are obtained at constant potential -0.1V . The compact and uniform Co/Zn thin films are obtained by pulse electrodeposition and higher coercive force and smooth domains of Co/Zn magnetic films were obtained.

