



Cinética da eletrodeposição simultânea de ZnCo

Kinetics of the simultaneous ZnCo electrodeposition

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Abstract: In order to be adopted by the industrial field, the alloys electrodeposition process must produce electrodeposits with the same composition and properties in as wide as possible electrodeposition parameters region. This implies the need to know not only the metals' electrodeposition kinetics in aqueous electrolytes containing both metals but also how that kinetics is affected by the metals relative concentration. Electrodeposition of zinc + cobalt alloys is classified as anomalous co-deposition due to the preferential deposition of the less noble metal [1], although preferential deposition of zinc occurs under certain experimental conditions [2-4]. Various explanations for anomalous co-deposition are given in the literature. As a result, the existing interpretations of the mechanism are ambiguous and need to be supported by additional arguments. In this report, voltammeteries in the deposition solution are analyzed for several relative concentrations of metal ions in solution and the composition of the deposits is determined as a function of the deposition current density. The morphology, composition and phases of the deposits were observed by SEM, ICP and XRD, respectively. The results showed that the presence of zinc in the bath inhibited the cobalt deposition. In underpotential depositions, the electrode potential determines the deposition of various phases with different composition.

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