Hull Cell Study of Electrodeposited NiAgW Alloys

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NiAgW alloys have been of interest in the electronic industry as an alternative for interconnects and electronic packaging. In order to address a cost-effective way to fabricate them as thin films and as nanowires, this work explores the electrodeposition technique. It is the first report of electrodeposited NiAgW alloys. The influence of three variables: pH, electrolyte agitation, and current density on the deposit quality, composition and morphology are considered. A Hull cell is used to quickly survey the variable effects in a combinatorial approach. The electrolyte agitation of the Hull cell is first characterized, and the composition and morphology analyzed by XRF, SEM, TEM. Results indicate the importance of agitation in obtaining Ag-rich deposits, while pH plays a key role towards stability of the electrolyte.