Electrodeposition Studies of AgNiW Alloys

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Abstract

The electrodeposition of AgNiW alloys is explored. These alloys are of interest as a potential alternative contact material for semiconductor fabrication and MEMS devices. The proposed material combines the high conductivity of Ag with the high hardness of NiW. Electrodeposited alloys of AgNiW have not yet been reported. Key challenges to address are: designing an electrolyte that is environmentally friendly, and controlling the deposit composition. Experiments are performed using a rotating Hull cell as a tool to survey the deposition conditions. Two electrolytes are studied, one with ammonia and the other with thiourea/EDTA as complexing agents. The deposit composition is characterized by x-ray fluorescence. All three elements were found to be present in deposits from the ammonia electrolyte. Only Ni-rich, NiAg deposits were observed from the thiourea/EDTA electrolyte. Future studies will examine the coupled reaction kinetics.