# Electrochemical Preparation of Tin-Silver Alloy to Be Used as Solder

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Nowadays lead poisoning is the most common type of heavy metal poisoning. Children are even more at risk as they absorb a greater proportion of lead at a faster rate compared to adults. Children may be poisoned after they only have been close to adults soldering some components to a circuit board. This is what happened to our friend, so we have long been familiar with the problem. Why do not people use lead-free solders? Because, it turns out, their production is very complicated. We took a solution for electrochemical deposition of the Sn-Ag alloy described in an article by L.X.Wei [Wei L. X., Haseeb A., Yingxin G. Effects of thiourea and gelatin on the electrodeposition of Sn-Ag solder alloy //Quality Electronic Design (ASQED), 2012 4th Asia Symposium on. – IEEE, 2012. – ?. 291-296] which was not introduced into the industry because of instability of its composition. We added an antioxidant, a brightener and a ligand ion to make the solution stable, and we could obtain the alloy that is close to eutectic, of the best quality. Throughout the research process, we analyzed alloys obtained from five solutions of different composition and at different current densities. We employed gravimetric and elemental analysis, studied their microstructures and melting temperatures, and tested their solderability. By electrochemical precipitation of a solution containing a brightener of 7.5 · 10-4 mol/dm3, we obtained the Sn-Ag alloy with a composition close to eutectic, high solderability, and a sufficiently low melting point. In the future, we can try to introduce our solution into the industry as there are no expensive components in its composition, and it has been stable in our laboratory for more than 6 months.

**Awards Won:**