

Green Electrodeposition Trends in Semiconductor Industry

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Semiconductor industry historically favored vapor techniques for metallization. Over recent years, electrodeposition established itself as a viable technological step due to advances in Cu damascene interconnect, 3D Wafer Level Packaging using TSV and other advanced metallization packaging technologies. Green initiatives strongly affected the trends in these technological processes.

Presentation will describe different approaches to reduce environmental impact of electrodeposition and how they were applied in real life situations. It will focus on importance of process control especially for unstable electroless solutions. Each bath disposal has much larger environmental impact than accumulated impact during the normal operation of bath during bath lifetime period. Express analyses can significantly extend lifetime through characterization of main component and bath stability.

Process control itself has to adhere to green initiatives and favor sensor technology over methods employing highly toxic chemical. Presentation will describe evolution of metrology for electrodeposition including examples for lead-free solder processes.

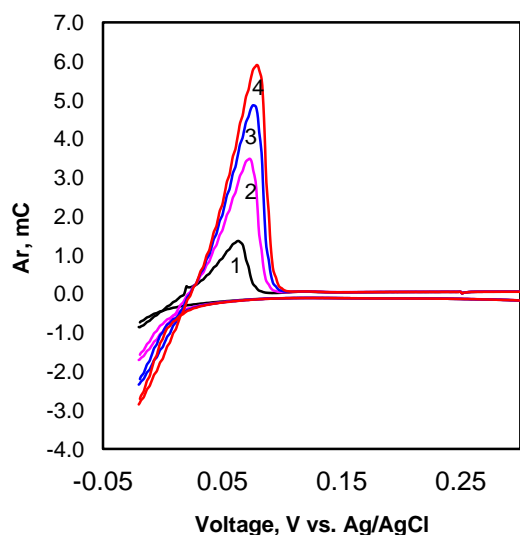


Figure 1. Express Monitoring of Hypophosphite in Electroless Solutions by Voltammetry (1-0 ppm, 2 – 0.3 ppm, 3- 0.6 ppm, 4 – 0.9 ppm)

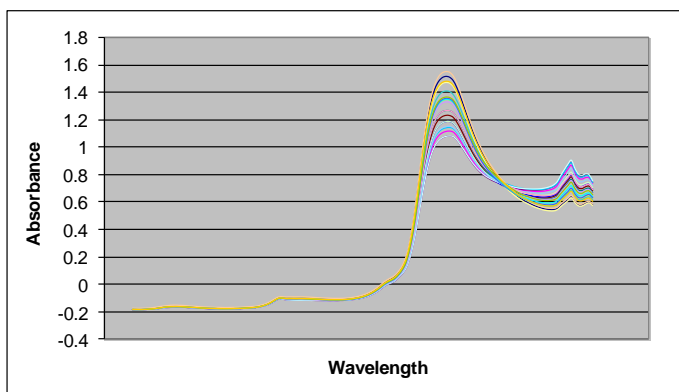


Figure 2.. Express Monitoring of Complexer in SnAg Electrodeposition Solution by Near Infrared Spectroscopy