

9th International Workshop on Electrodeposited Nanostructures

Fabrication of segmented Au-Ag nanowires and nanogaps by electrodeposition in etched ion-track membranes

I. Alber ¹, R. Neumann ¹, M.E. Toimil-Molaes ¹

¹ Materials Research Department, GSI Helmholtz Centre for Heavy Ion Research,
Planckstr. 1, 64291 Darmstadt, Germany

We report on the fabrication of segmented Au-Ag alloy nanowires with controlled dimensions in etched ion-track membranes by pulsed deposition, and their characterization. The deposition is performed at 60 °C in a three electrode set-up using a Ag/AgCl reference electrode, and a platinum wire as counter electrode. The electrolyte contained $\text{KAu}(\text{CN})_2$, $\text{KAg}(\text{CN})_2$, and sodium carbonate. We studied the influence of electrolyte composition, and pulse characteristics on the composition and length of the segments. By selective dissolution of the middle Ag-rich segment in between two Au-rich segments, nanowires separated by small gaps down to ~ 5nm are created.