

**Site selective electrodeposition of Cd on Au(111) as template  
for nanoscale semiconductor structures**

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The initial stages of Cd-electrodeposition on a herringbone reconstructed Au(111) surface from sulfuric acid solution were investigated by means of an electrochemical scanning tunnelling microscope (EC-STM). A novel type of site-selective nucleation of Cd clusters was observed in the underpotential region starting around 300 mV positive to the Nernst potential for Cd bulk deposition. Distinct nanocrystals of monoatomic height are formed. In this underpotential regime nucleation proceeds exclusively based on the sites of the Au(111) herringbone reconstruction leading to a self organized surface patterning consisting of nanoscale Cd islands and lines. The site-selective underpotential-controlled electrodeposition of Cd can be used in a second step to chemically/electrochemically generate II-VI (e.g. CdS) semiconductor nanocrystals.