

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Growth of Electrodeposited Ag Nanowires in Anionic Surfactant Nanotemplates on Au(111)¹ ERIC BORGUET, Temple University, KYOUNGJA SEO, Temple University, TAO YE, Pennsylvania State University — Ordered molecular systems should provide templates of molecular dimensions as demonstrated by the growth of silver nanostructures in the potential induced nanotemplates of SDS (sodium dodecyl sulfate). Electrochemical STM (Scanning Tunneling Microscopy) results suggest that SDS molecules form hemicylinders on the Au(111) surface in 0.1M HClO₄ solution. The hydrophilic sulfate groups self-assemble to face to the aqueous interface while the hydrophobic backbone adopts a tail to tail configuration. The SDS hemicylinders structures are stable over the potential range of -0.1 V_{SCE} to 0.4 V_{SCE}. Silver electrodeposition takes place near the hydrophilic sulfate head, and leads to the formation of nanowires that grow in the same direction as the SDS hemicylinders. Ag nanowires are typically less than 2 nm wide.

¹This work was supported by the NSF (NER DMI 0508508)

Kyoungja Seo
Temple University

Date submitted: 02 Dec 2005

Electronic form version 1.4