Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Controlled Attachment of Gold Nanoparticles on Ordered Titania Nanotube Arrays MOHAMED ABDELMOULA, EUGEN PANAITESCU, Physics Department, Northeastern University, CHRISTIAAN RICHTER, Yale University, LAURA LEWIS, Department of Chemical Engineering, Northeastern University, LATIKA MENON, Physics Department, Northeastern University — Gold nanoparticles have been deposited on electrochemically synthesized high-aspect ratio Titania nanotubes. Titania nanotubes with very long aspect ratio as long as 50microns are synthesized by means of electrochemical anodization of titanium foils in chlorine containing electrolytes. The tube dimensions (diameter, wall thickness and length) of the tubes can be controlled in our fabrication approach. The gold particles are deposited on the tubes by means of a modified deposition-precipitation method in HAuCl4 solution under controlled concentration of the solution. We show that by adjusting the fabrication conditions, we can obtain a high deposition density of the gold particles over the nanotube surface (over 90% coverage percentage) and also have good control over the size of the gold nanoparticles (<5 nm). We show that there is an increase in particle size upon increasing the deposition period. The samples have been characterized by means of scanning and transmission electron microscopy. The optical and preliminary catalytic properties of such gold-supported Titania nanotubes will also be reported.

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Date submitted: 19 Nov 2008 Electronic form version 1.4