OAK RIDGE NATIONAL LABORATORY
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Nanotextured, non-plating electrode for low temperature electrochemical nanoparticle synthesis and other particulate electrochemical reactions

Disclosure Number

201303002

Technology Summary

This invention disclosure describes a new electrochemical approach for conducting nanoscale redox reactions including the synthesis of crystalline nanostructured particles and rods with controlled particle size. These particles and rods have application in low-cost solid state lighting, photovoltaic, electronic and energy-related applications. The approach relies on electrochemical reduction of inexpensive precursors using a novel electrode, combined with mild surfactants to aid in size control. By making tailored nanoparticles (NPs) with novel properties and functionalities in economic quantities, the process opens potentially new nanotechnology applications. The method is demonstrated with cadmium sulfide and tin oxide and should be readily applicable to other metal sulfides and oxides such as ZnS, CuS, SnS as well as with the similar series of tellurides or selenides as well as other metal complexes.

Inventor

RONDINONE, ADAM J

Center for Nanophase Matls Sciences Div

Licensing Contact

SPECK, ROBERTA R
UT-Battelle, LLC
Oak Ridge National Laboratory
Rm 141, Bldg 4500N, MS: 6196
1 Bethel Valley Road
Oak Ridge, TN 37831

Office Phone: (865) 576-4680
E-mail: SPECKRR@ORNL.GOV