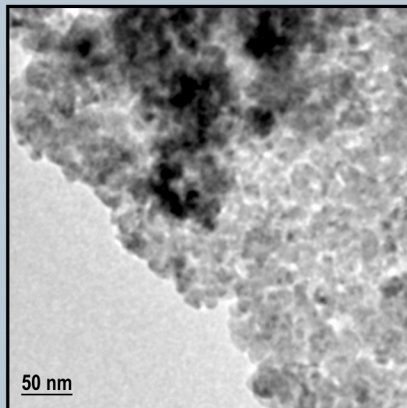
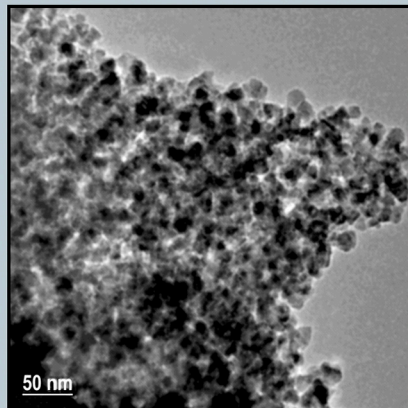


Microbially Mediated Method for Making Semiconductor Nanoparticles

UT-B ID 200701968

CdS Nanoparticles



Technology Summary

To address the commercial need for bulk production at a reasonable cost, ORNL researchers developed a microbially mediated method for the production of semiconductor nanoparticles. This invention also offers a means of microbial synthesis that yields a purer and more uniform product.

Nanoparticles with metal non-oxide compositions, also known as semiconductor or quantum dot nanoparticles, are increasingly used in a wide range of electronics, including LED displays, solar cells, and medical imaging. Yet the energy requirements of current production methods are too costly for commercial applications.

The invention facilitates economical output of tailored nanoparticles via a scalable production scheme. In addition, the invention has the capability of defining the size, shape, composition, and/or crystalline structure of the nanoparticles. The location or width of the photoluminescent peak can also be controlled. Through the process of bacterial metabolism, the desired non-oxide compound is produced and may be collected as nanometer-sized particles.

Advantages

- <1% cost of traditional production methods
- Scalable production scenario
- Structure and size can be tailored

Potential Applications

- LED displays
- Solid state lighting
- Photovoltaic solar cells
- Biomedical treatments
- Fluorescent dyes
- Light-to-energy production
- Friend/foe battlefield tagging

Patent

Tommy J. Phelps and Robert J. Lauf, *Microbially-Mediated Method for Synthesis of Non-Oxide Semiconductor Nanoparticles*, U.S. Patent Application 12/364,638, filed February 3, 2009.

Inventors

Tommy J. Phelps¹ and Robert J. Lauf²
¹Biosciences Division
²Environmental Sciences Division
Oak Ridge National Laboratory

Licensing Contact

Renae Speck
Technology Commercialization Manager,
Biological and Environmental Sciences
UT-Battelle, LLC
Oak Ridge National Laboratory
Office Phone: 865.576.4680
E-mail: speckrr@ornl.gov

