J Material Sci Eng 2015, 4:3
http://dx.doi.org/10.4172/2169-0022.C1.032

OMICS International
conferenceseries.com

Adiabatic description of electronic states and the size-quantized stark effect in the semi-ellipsoidal quantum dots

A A Tshantshapanyan, K G Dvoyan and B Vlahovic
North Carolina Central University, USA

The electronic states in strongly elongated semi-ellipsoidal GaAs quantum dot (QD) in the presence of external electrical field are theoretically investigated within the framework of the geometrical adiabatic approximation. An atypical linear term in the effective confining potential forms a family of non-equidistant sublevels in the electron energy spectrum as a consequence of the specific symmetry of the QD. The possibility of implementation of the electron quasi-continuous spectrum over the lower energy levels through size-quantized Stark effect is also shown.

atshants@nccu.edu`

Synthesis and characterization of semiconductor nanomaterials

Latika Menon
Northeastern University, USA

Semiconductor nanostructured materials are expected to have tremendous impact in future applications related to electronics and energy. Our laboratory has carried out extensive work on synthesis and characterization of one-dimensional nanostructures of the type GaN nanowires and titania nanotube arrays. In the case of GaN nanowires, we have used a simple, scalable chemical vapor deposition process to demonstrate GaN nanowires in unique morphologies such as epitaxial nanowires in the cubic zinc blende structure with superior optical properties and serrated nanowires in wurtzite structure with enhanced effective surface area. While the epitaxial nanowires have direct application in nanoelectronic and optical devices, the serrated nanowires with their unique morphology and large effective surface area will have tremendous applications in sensors and lighting devices and p-n junction solar cells. Extensive research has also been carried out in our lab on the inexpensive and large-scale electrochemical synthesis of titania nantoube arrays. The nanotubes may be produced in the form of arrays (either free-standing or attached to Ti) or bundles or even single nanotubes. The nanotubes have numerous applications in energy: Photoanodes for cost-effective, third generation photovoltaic systems such as sensitized solar cells, portable photovoltaic devices, automobile/building integrated photovoltaics; photoanodes for photocatalytic applications such as in the production of hydrogen; and as robust supports for catalysts.

Biography

Latika Menon received her PhD in Physics from the Tata Institute of Fundamental Research, Mumbai, India in 1997. Since then she has held a Post-doctoral research associate position at the University of Nebraska-Lincoln followed by Assistant Professor in the Department of Physics at Texas Tech University. Currently, she is an Associate Professor of Physics at Northeastern University, Boston, MA. Her research interest is in the area of nanomaterials, particularly in the area of nanoporous templates, nanotubes, nanowires, etc., for applications in the area of energy, medicine, optics, electronics, etc. She has co-authored more than 80 publications in peer-reviewed research journals. She is also the Founder of a recently-incorporated start-up, Menon Laboratories, Inc., based in Massachusetts, USA.

l.menon@neu.edu