Abstract

In search of opto-electronic nano materials, we often come across Gallium Nitride nanotubes (GaN-NT) with excellent electrical and optical characteristics. Gallium Nitride nanotubes are predominantly semiconducting and have been less explored in its application as a transistor channel through Density Functional Theory (DFT). Comparing Gallium Nitride nanotubes with Boron Nitride nanotubes (BN-NT) and Carbon nanotubes (CNT), we have obtained distinguishing features of Gallium Nitride nanotubes. In this work, Transistor simulation with Gallium Nitride nanotubes has been reported with the nanotube as channel. Properties of various configurations of nanotubes are compared among Carbon, Boron Nitride and Gallium Nitride nanotubes.

References

- Aaron Franklin, Mathieu Luisier, Shu jen Han, George Tulevski, Chris Breslin, Lynne Gignac, Mark Lundstrom and Wilfried Haensch, "Sub-10 nm Carbon nanotube
- V. V. Pokropivnyi, &quot;Nanostructured Materials - Non-Carbon Nanotubes (Review): Types and Structure, &quot; Powder Metallurgy and Metal Ceramics, Vol. 40, Nos. 11-12, 2001


- Atomiztix tool kit – Virtual Nanolab software from Quantum wise.
- Richard Wilson, &quot;GaN market due for power boost, &quot; Electronics Weekly, March 2012.
- Shang Chao Hung, Yan Kuin Su, Te hua Fang, Shou jinn Chang and Liang Wen Ji, &quot;Buckling instabilities in GaN nanotubes under uniaxial compression, &quot; IOP Nanotechnology, pp 2203-2208, 2005.

Index Terms

Computer Science

Applied Sciences

Keywords

Gallium Nitride Nanotubes   Gan Nanotube Transistor   Density Functional Theory (dft)   Bond Rotation

Boron Nitride Nanotubes