Yang Han, J Nanomed Nanotechnol 2018, Volume 9
DOI: 10.4172/2157-7439-C10-094

Mechanical, electronic, magnetic and thermal transport properties in two dimensional materials

Yang Han
Harbin Engineering University, China

Novel nanostructures have been fabricated continuously with the help of the development of nanotechnology. These structures have a series of greatly different physical properties from their bulk counterparts, making them to have a great potential application in the physics, chemistry, materials science, biology and life science, nanoelectronics and nanotechnology. Research on two-dimensional (2D) materials such as graphene and graphene-like group-IV materials is of fundamental scientific interest from the view of the variety of applications. For example, graphene possesses extreme mechanical strength, exceptionally high electrical and thermal conductivities, as well as many other supreme properties, all of which make it highly attractive for numerous applications. Inspired by the prospective properties of graphene, there has been increasing interest in its "cousins", i.e., two-dimensional honeycomb lattices composed of other group-IV elements, e.g. Si and Ge, which naturally have been considered to have a graphene-like hexagonal structure with similar exceptional properties. Layered silicon oxide is also an important building block that provides insulating barriers in electronic devices, e.g. as a gate oxide in field effect transistors. Moreover, thin silica films grown on metal single crystal substrates can be used as model systems for studying the structure-property relationships of silica and related materials using surface science techniques. This talk mainly focuses on the mechanical, electronic, magnetic and thermal transport properties of the two dimensional (2D) graphene-like materials.

Recent Publications

1. Cmiel V, Skopalik J and Polakova K (2017) Rhodamine bound maghemite as a long-term dual imaging nanoprobe of adipose tissue-derived mesenchymal stromal cells. Eur Biophys J. 46:433–444.
2. Kalytchuk S, Polakova K and Wang Y (2017) Carbon dot nanothermometry: intracellular photoluminiscence lifetime thermal sensing. ACS Nano 11: 1432–14442.
3. Polakova K, Mocikova I and Purova D (2016) Magnetic resonance cholangiopancreatography (MRCP) using new negative per-oral contrast agent based on superparamagnetic iron oxide nanoparticles for extrahepatic biliary duct visualization in liver cirrhosis. Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub. 160:512–517

Biography

Yang Han has completed her PhD from Nanjing University (NJU), China and postdoctoral studies at GHI, RWTH Aachen University, Germany and LEMTA-CNRS/ Université de Lorraine. Currently, she is an Associate Professor in Harbin Engineering University, China. She has more than eight years of experience in studying mechanical, thermal, electronic, magnetic and thermoelectric properties of materials by using DFT and MD methods. She has published 18 SCI papers in reputed journals, with two of them as First Author. Besides, she has attended European and many international conferences as a Keynote Speaker and Organizing Committee Member.

yhan.nju@gmail.com

Notes: