

Geometric and Electronic Structure of CNTs

Masoud Nekoei *, Parisa ZangiAbadi

1. Robotic Engineering, Sirjan University of Technology, Kerman, Iran; Masoudnekoei@ymail.com
2. IT Engineering, Sirjan University of Technology, Kerman, Iran; Parisazangiabadi0@gmail.com

Abstract

The carbon atoms in a carbon nanotube (CNT) are bonded trigonally in a curved sheet (graphite layer) that forms a hollow cylinder in nanoscale, similar to that in other fullerenes. The length of CNTs may range from less than a micron to several millimeters or even centimeters. Their unique nanostructures result in many extraordinary properties such as high tensile strength, high electrical and thermal conductivities, high ductility, high thermal and chemical stability, making them suitable for various applications.

Key words: Structures of carbon nanotubes; Transport properties; Electronic properties; Geometric structure

1. Structures of Carbon Nanotubes

Until now, various CNTs are synthesized, such as single-walled CNTs (SWCNTs), double-walled CNTs (DWCNTs), multi-walled CNTs (MWCNTs), and coiled CNTs, etc. The chemical bonds in CNTs are all sp^2 bonds, similar to those of graphite. Below we introduce some of CNTs with different morphology. [3–11].

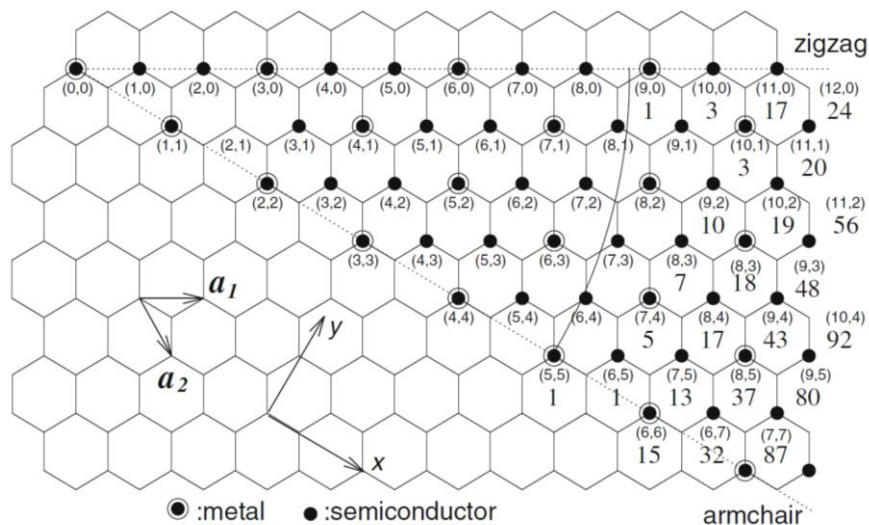


Fig.1: The hexagonal honeycomb lattice of the graphite layer. From Dresselhouse et al. [3]