

*Chapter - 4*

**CARBON NANOTUBES**

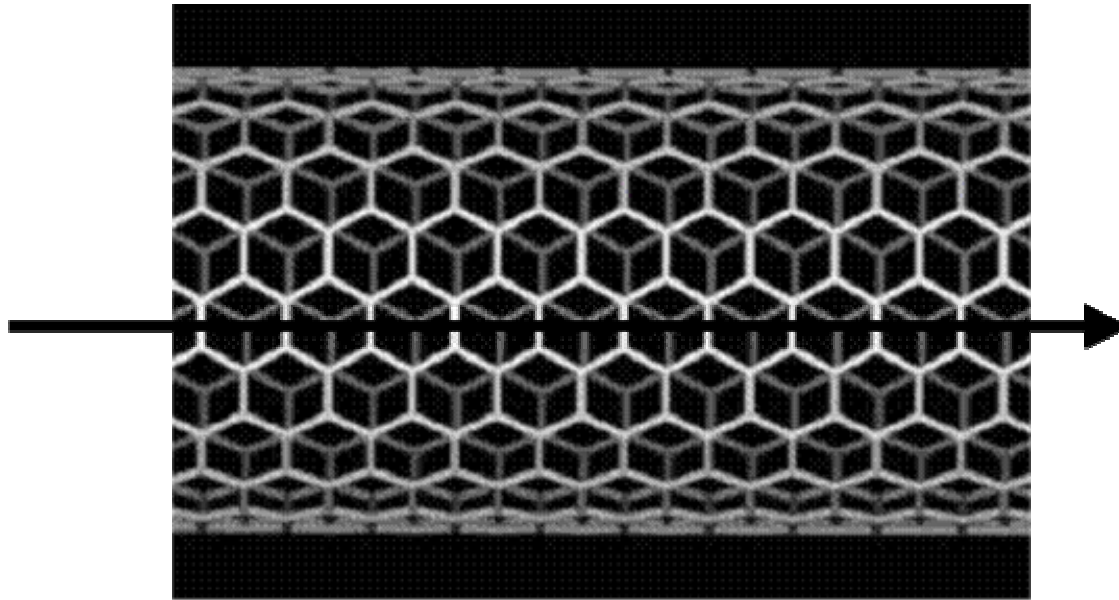


Figure 1. A part of the nanotube. The tube is highly symmetrical and is made from a grapheme sheet.

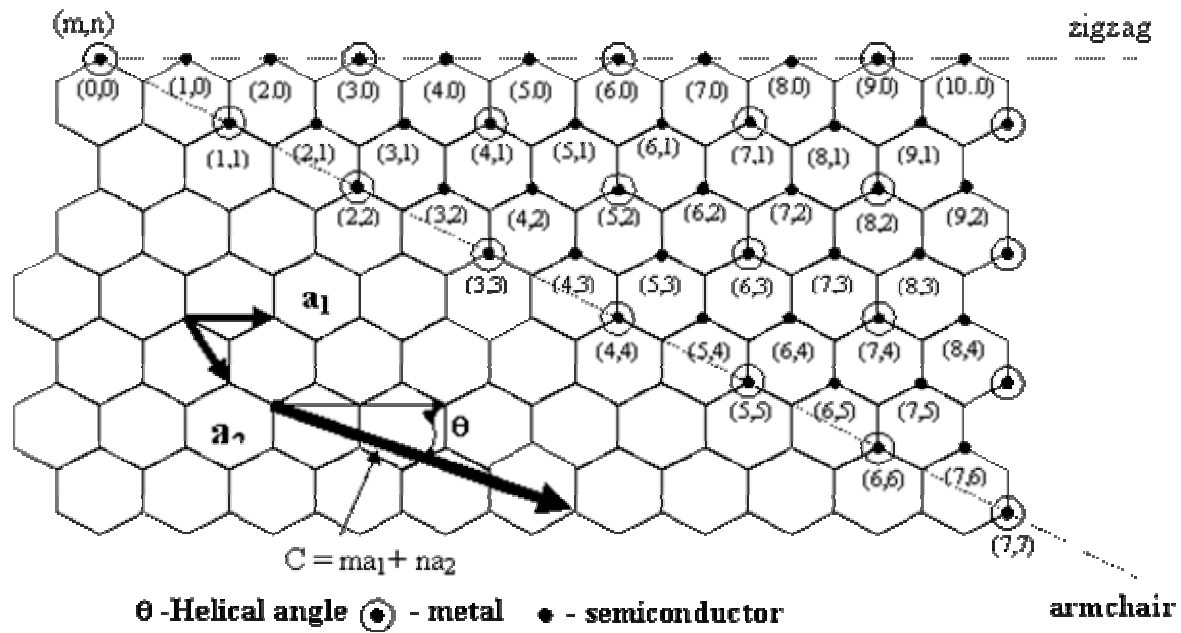


Figure 2. (a) illustration of the notations used in understanding carbon nanotubes. (b) Indexing scheme used in carbon nanotubes.

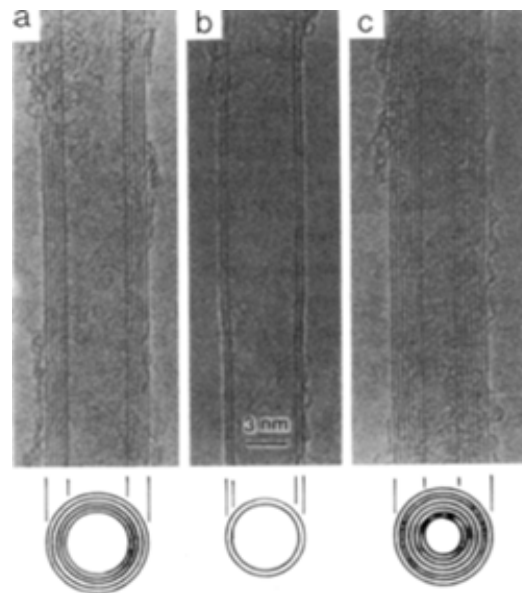


Figure 3. Multiwalled carbon nanotubes of various diameters observed by Ijima ( S. Ijima, Nature, 354 (1991) 56). Cross sectional view of the tube is also shown.

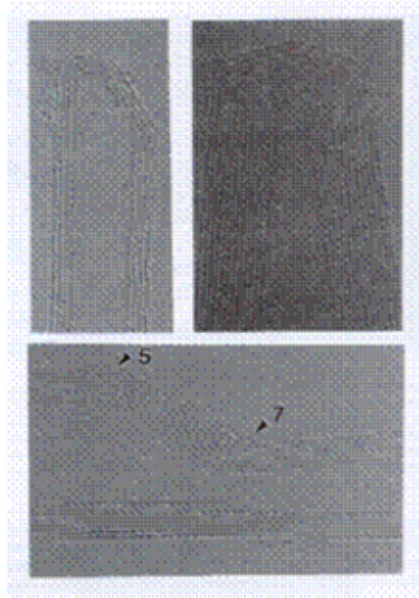


Figure 4. Transmission electron microscopic images of multiwalled tubes showing the various tip morphologies.( P. M. Ajayan and T. W. Ebessen, Rep. Prog. Phys. 60 (1997) 1025) Defects incorporating pentagons (marked 5) and heptagons (marked 7) are shown. While pentagon gives positive curvature, heptagon gives negative curvature. Reprinted with permission from IOP publishing.

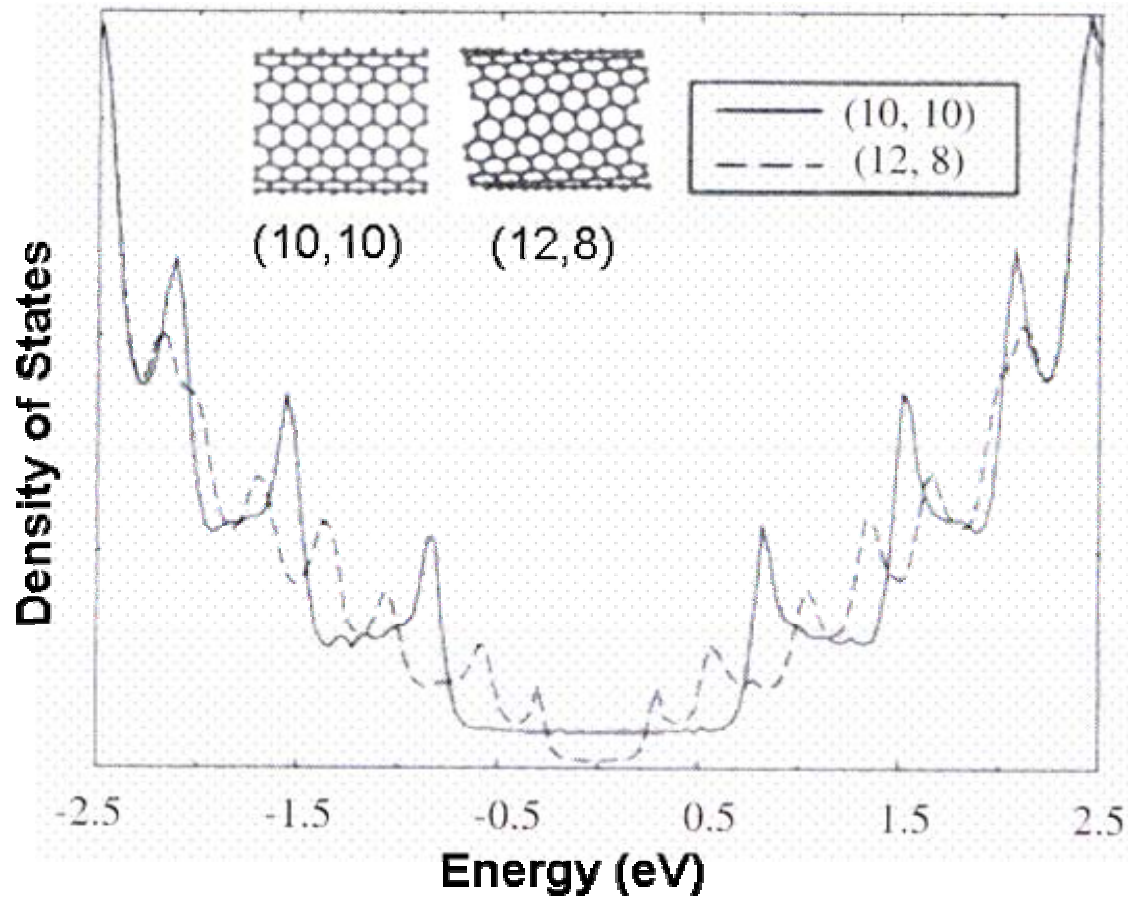


Figure 5. Calculated electronic density of states for two SWNTs ( P. M. Ajayan, in Nanostructured Materials and Nanotechnology, Ed. Haro Singh Nalwa, Academic Press, San Diego, 2002.)The tubes corresponding to the indices (10,10) and (12,8) are shown.



6. Picture of a 5" diagonal active display developed by Samsung Corporation (D. -S. Chung, S. H. Park, H. Choi, S. N. Cha, J. W. Kim, J. E. Jang, K. W. Min, S. H. Cho, M. J. Yoon, J. S. Lee, C. K. Lee, J. H. Kim, J. E. Jung, Y. W. Jin, Y. J. Park and J. B. You, Appl. Phys. Lett., 80 (2002) 4045). Copyright-Arte of Physics.

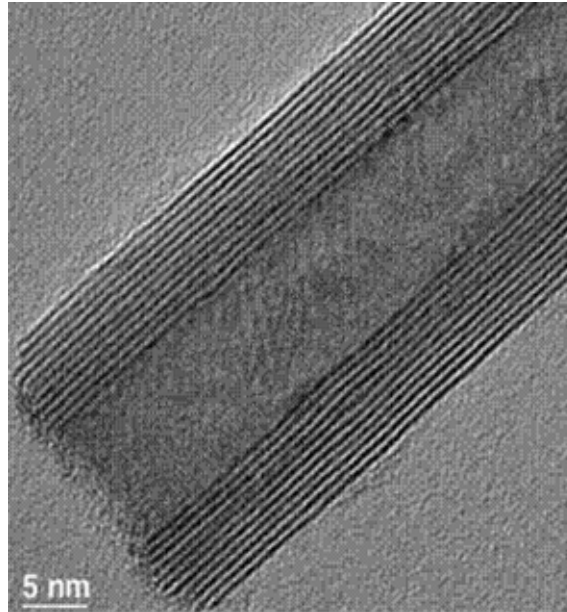


Figure 7. [Electron micrograph of part of a WS<sub>2</sub> based nanotube.](#) ( R. Tenne, L. Margulis, M. Genut and G. Hodes, Nature 360 (1992) 444). The tube is assumed to be hollow. The contrast within the tube is attributed to the outer wall, perpendicular to the tube. [Used with permission from the author.](#)