



# Nanomaterials

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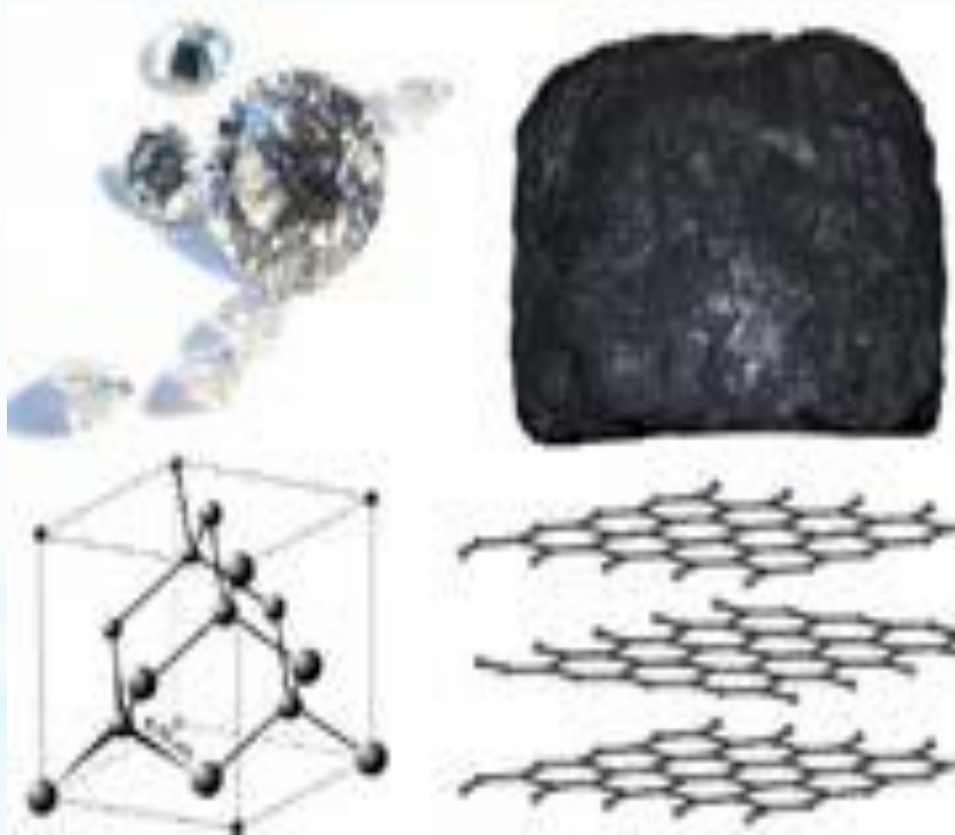
**Materials Engineering Department/ University of Technology**

**General Materials Branch**

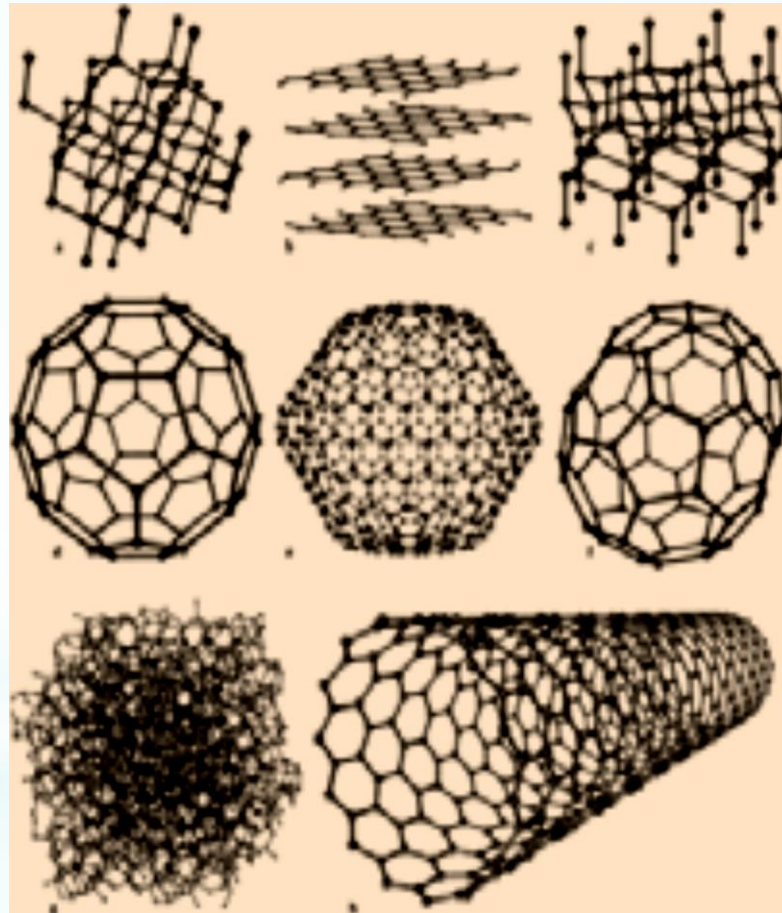
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**2018-2019**

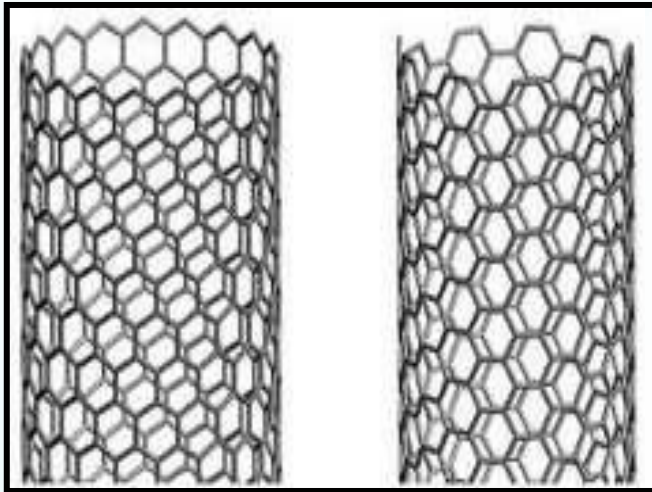
# Carbon based materials



# Carbon based materials



# Carbon nanotubes



Carbon Nanotubes.



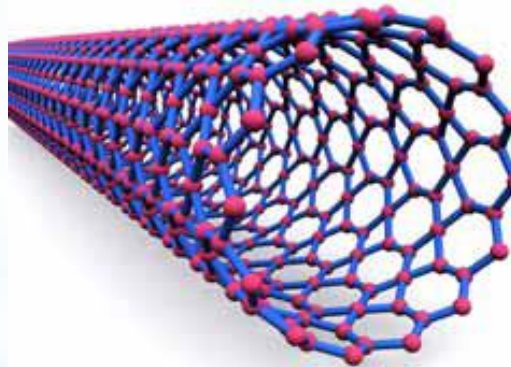
Buckyball.

Fullerene structures.

# Types of carbon nanotubes

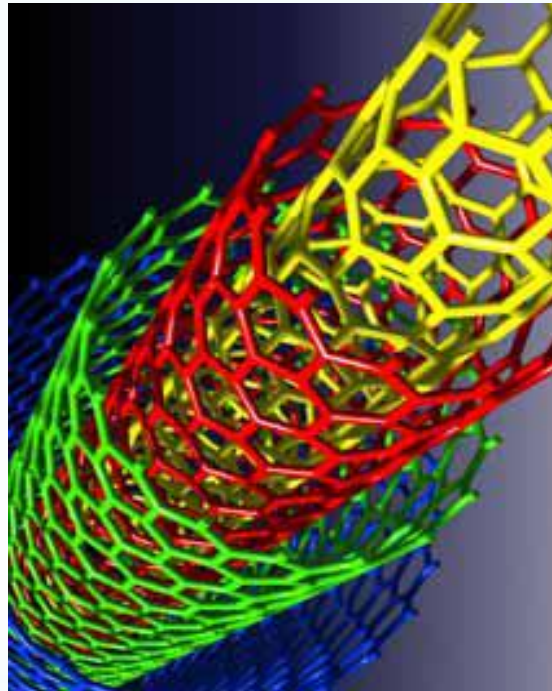
Carbon nanotubes can appear as single-wall nanotubes (SWNTs), or multi-wall nanotubes (MWNTs).

*Single (SWNTs) and Multi-wall (MWNTs) nanotubes*

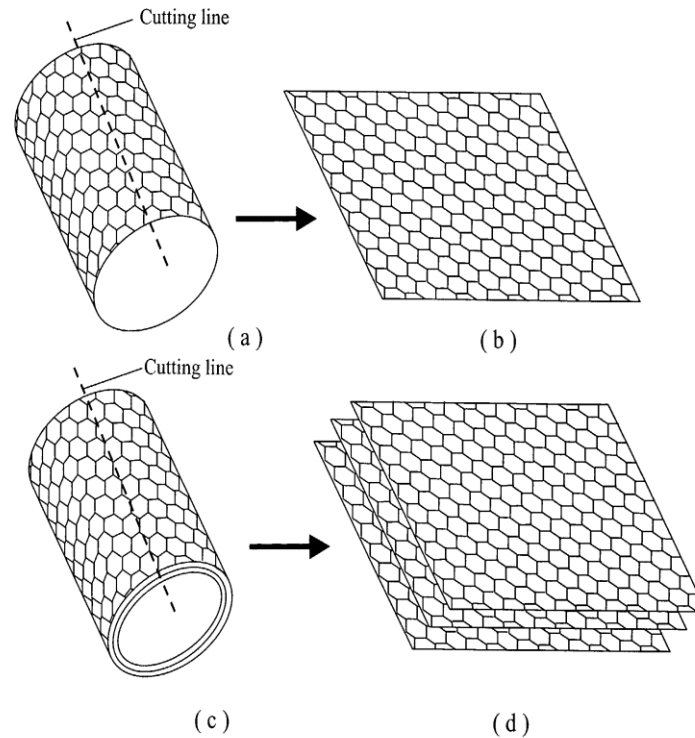


*Single (SWNTs) nanotubes*

## *Multi-wall (MWNTs) nanotubes*

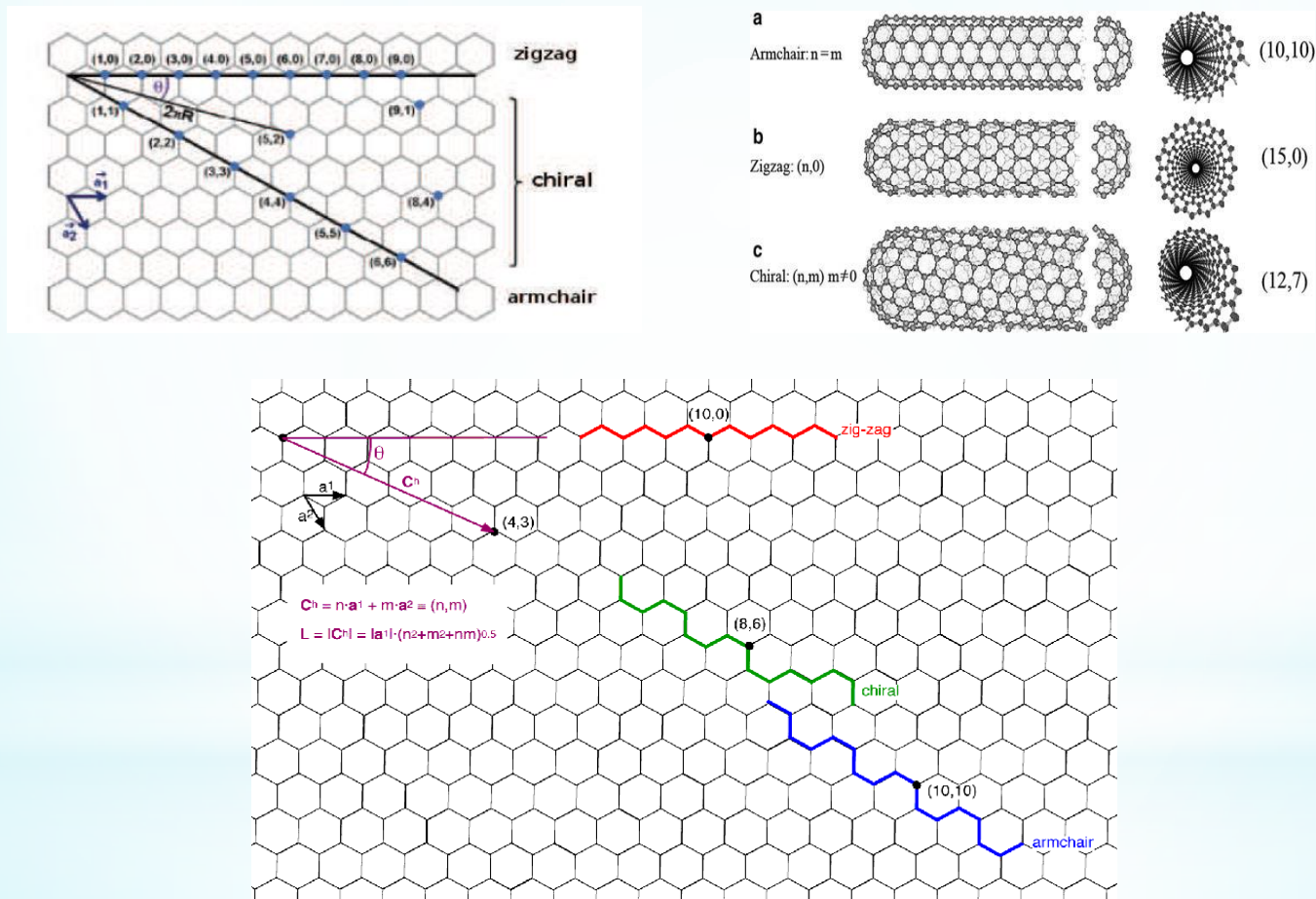


**Figure *Multi-wall (MWNTs) nanotubes***



) Graphene production method., CNT come in different types and thicknesses - multi wall, single wall, stacked cup, etc. Graphene is flat and much better for formulating thermally conductive materials.

# Structure of carbon nanotubes



Fig(8 ) Illustration of some possible structures of carbon nanotubes, depending on how graphite sheets are rolled: (a) armchair structure; (b) zigzag structure; (c) chiral structure.



# *Graphene*

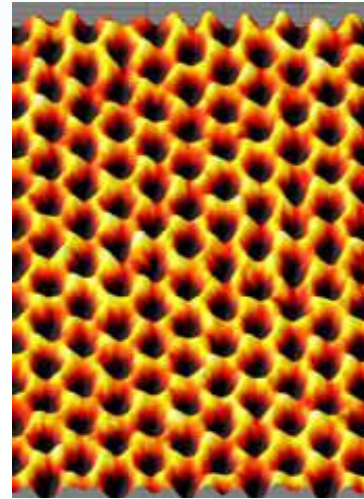
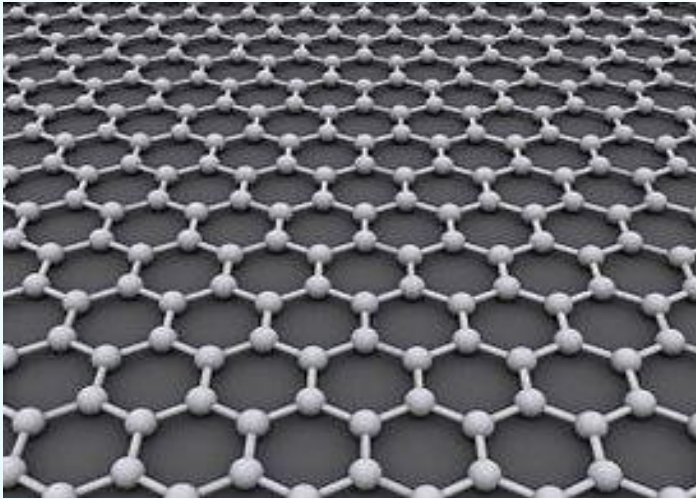
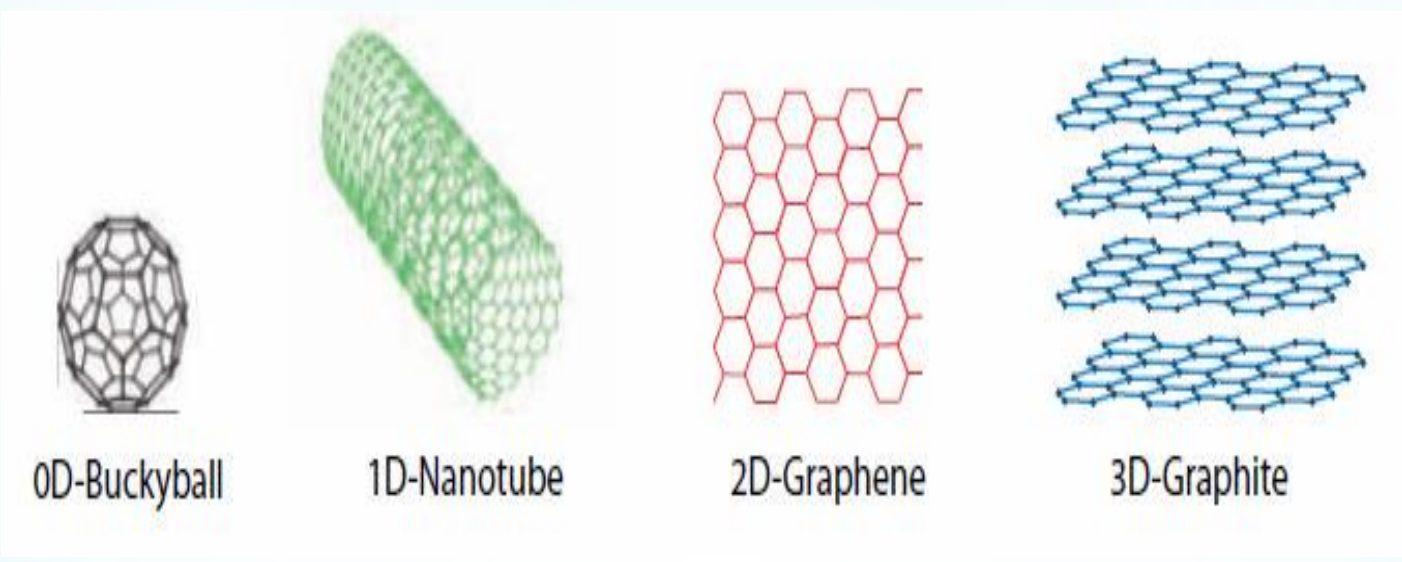


Fig. Graphene



**Figure Carbon nanostructures**