NANOTUBES

INTRODUCTION

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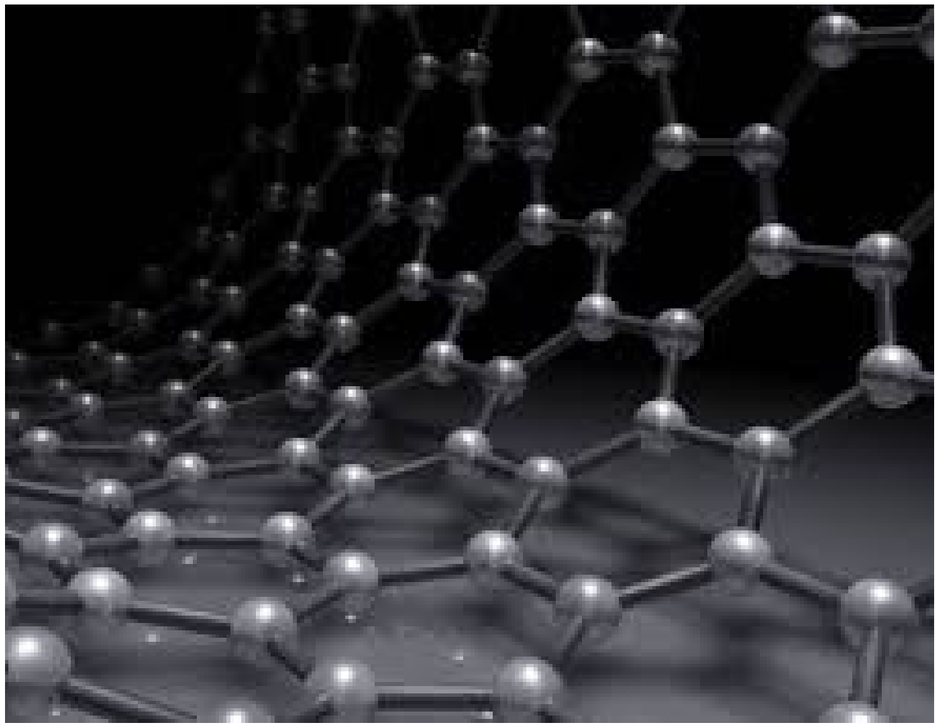
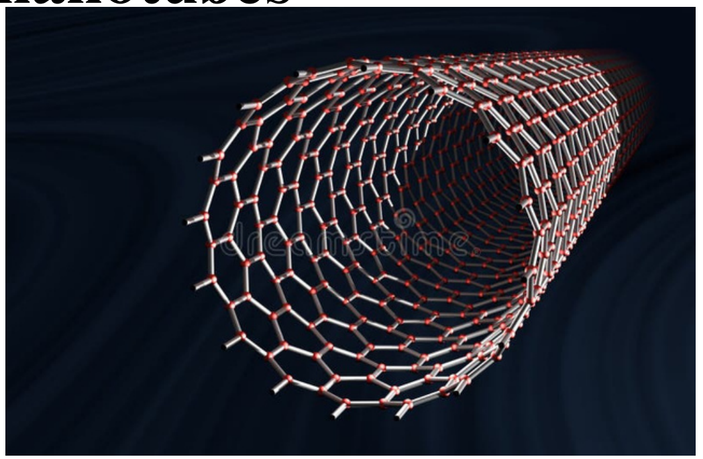
NANOTUBES DEFENITION

- They are tubes like structure with a diameter of 1-100nm and a length of few nanometer to Microns
- nanotubes consists of tiny cylinders of carbon's and other materials like boron nitride
- example: carbon nanotubes(CNT) def of CNT is a tubular form ofcarbon with 1-3 nanometer. in diameter and length of few nanometer



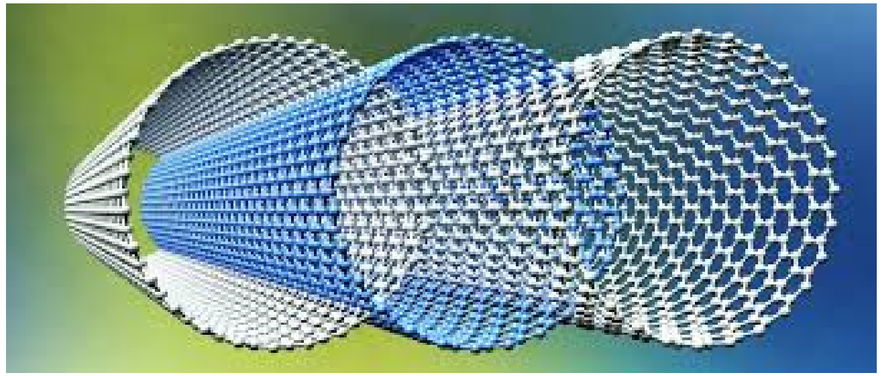
- To microns .generally carbon in the solid phase . exist in different allotrophy form like graphite,diamond,fullerence and nanotubes

Types of nanotubes:



- single walled CT: (zigzag structure)

- multi walled CT: (chiral structure)



- **Single walled(SWNT):**
  - **Consists of 1 tube of graphite it is the one atom thick having a diameter of 2nm & a length of 100nm**

- **Types:**
  - **Arm chair structure: the lines of hexagons are parallel to the axis of the nanotubes**
  - **zig zag structure: the lines of carbom bonds are down the centre**
  - **chiral structure: it exhibits twist or spiral around the nanotubes**

Multi walled nanotubes (MWNT)

- **MWNT consist of multiple layers of graphite rolled in on themselves to form a tube shape . it exhibits both metallic and semiconducting properties . it is used for storing fuels such as hydrogen and methane**

Properties of CNT's:

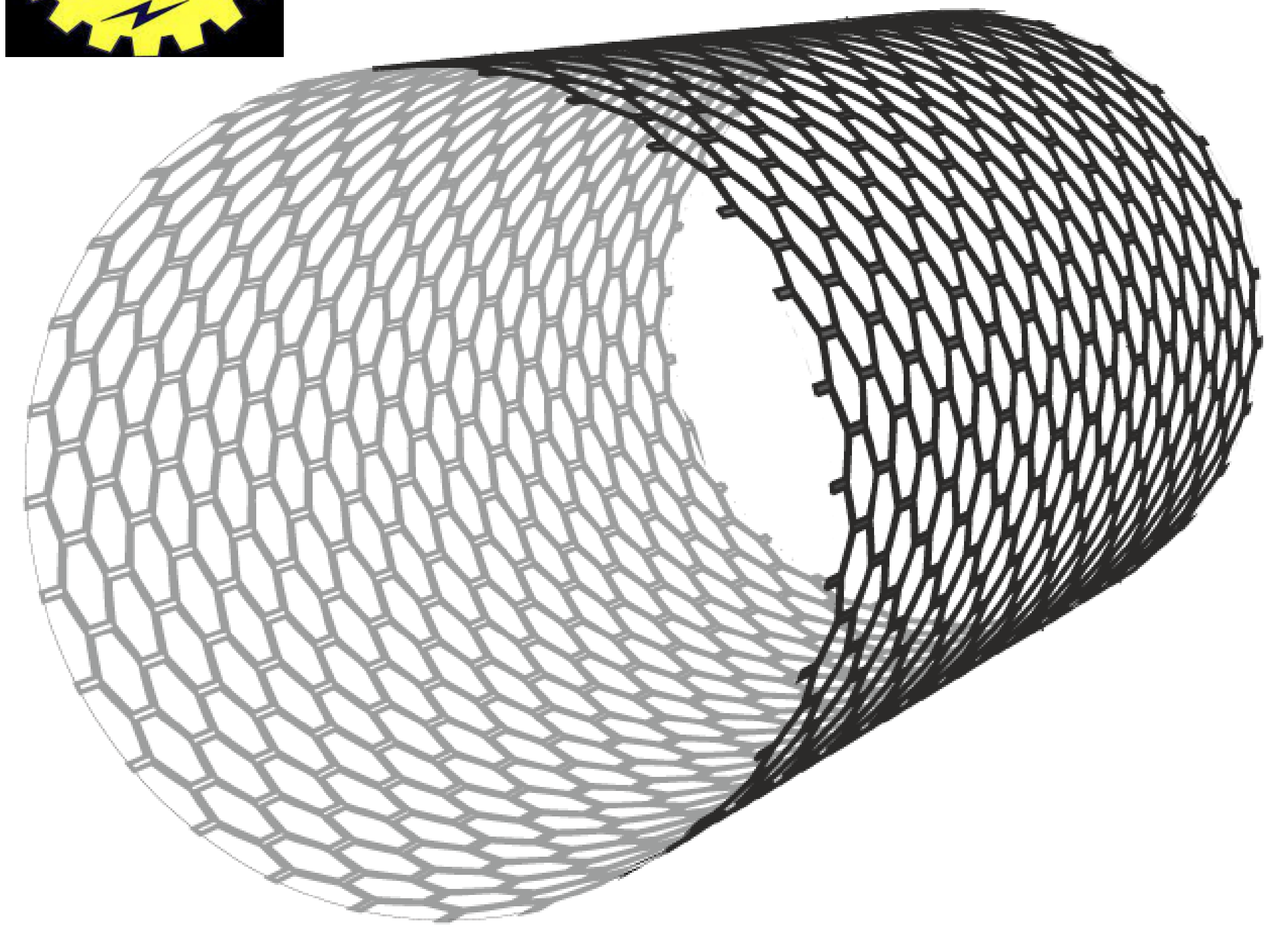
- CNT's are very strong ,withstand extreme strain in tension and posses elastic flexibility
- It is highly conducting and behaves like metallic or semiconducting materials
- It has very high thermal conductivity and kinetic properties.

Uses of CNT's:

- It is used in battery technology and in industries as catalyst .
- CNT's are used effectively inside the body for drug delivery
- It is used in components ,IC's
- It is also acts as an efficient catalysts for some chemical reactions .

SWCNT

MWCNT



0.5–2.5 nm

7–100 nm