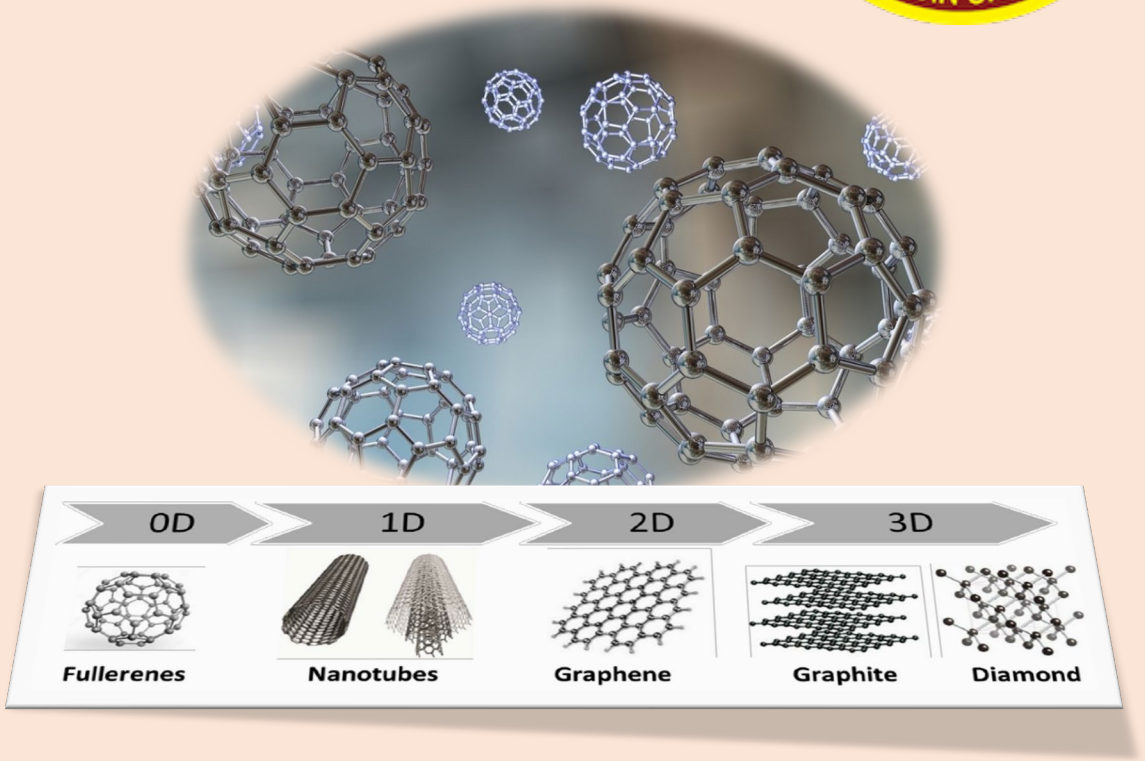
Nanoscience

Chapter One: Nanoscale

1-1 Introduction to Nanoscale
1-2 Nanoscience and Nanotechnology
1-3 Applications of Nanotechnology
1-4 (3D) Bulk materials
1-5 CLASSIFICATION OF NANOMATERIALS
1-5-1 Zero-Dimensional (0-D)
(Nanoparticles, Quantum Dots, Fullerene (C60)
1-5-2 One-Dimensional (1-D)
(Nanowires, Nanorods, Nanotubes, Nanofiber)
1-5-3 Two-Dimensional (2-D)
(Nanofilms and Graphene + Graphite)

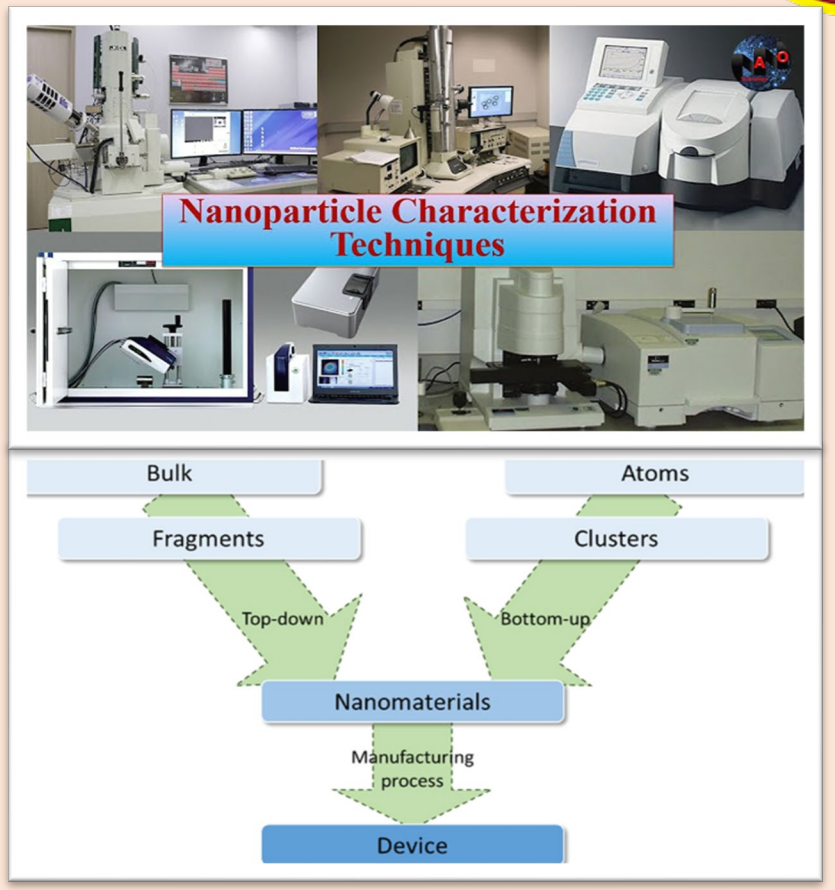


By
Dr.Botan Jawdat Abdullah
Asst Professor in Nanoscience

Fabrication and Characterization of Nanomaterials

Chapter Two:

2-1 Bottom-up and Top-down methods
2-2 Synthesis methods of Nanomaterials:
Laser Ablation Method, Mechanical Milling Method, Vacuum Sputtering Method, Arc-Discharge Method, Sol–gel method, Spinning coating method, Spray coating method, Chemical vapor deposition, Green method…
2-3 Exploring the World through Microscopes
2-4 Experimental techniques that are used for nanomaterials characterization:
Scanning Electron Microscope, Transmission Electron Microscope, Scanning Tunneling Microscope, Atomic Force Microscope, High-Resolution Transmission Electron Microscope, XRD, EDX, UV-Vis, FTIR and Raman…

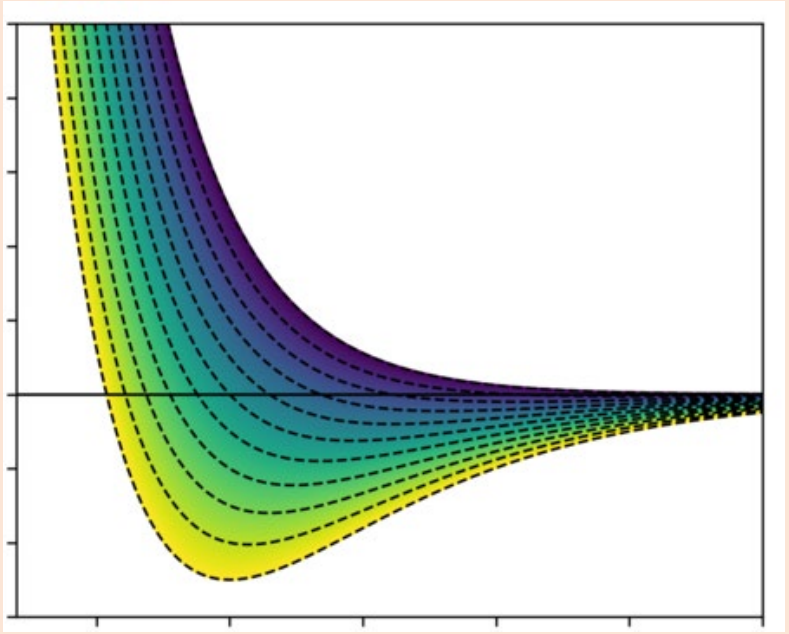


By
Dr.Botan Jawdat Abdullah
Asst Professor in Nanoscience

Interatomic Force and Bonding in Bulk and Nanoscale materials

Chapter Three

2-1 Introduction
2-2 Force Between Atoms
2-3 Cohesion of Atoms and Cohesive Energy
2-4 Calculation of Cohesive Energy
2-5 Bonding in Solids
2-6 Ionic Bonding
2-7 Covalent Bond
2-8 Metallic Bond
2-9 Dipole and Hydrogen Bond



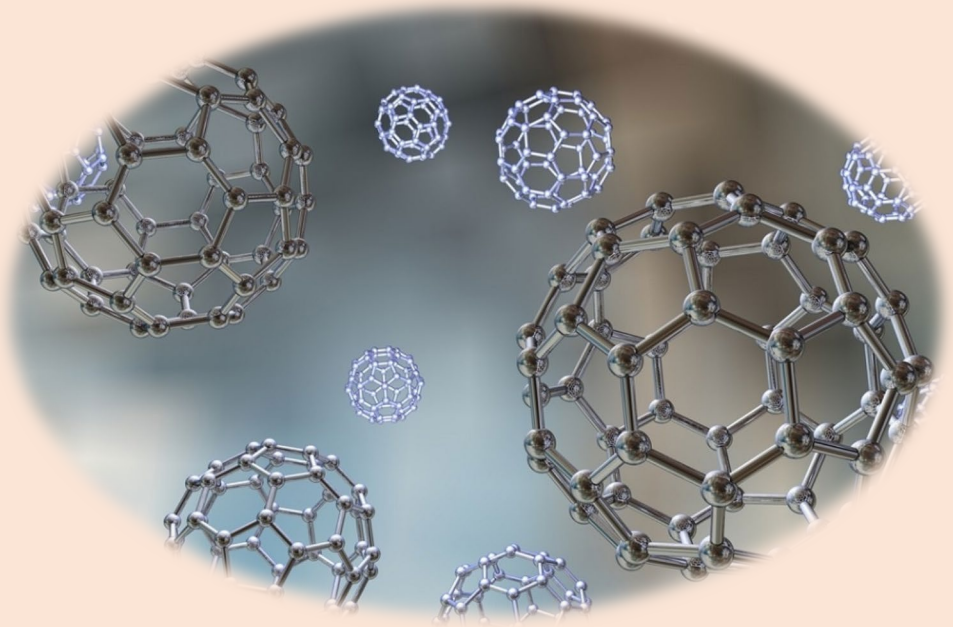
By

Dr.Botan Jawdat Abdullah

Asst Professor in Nanoscience

Physical Properties

Chapter Four
Physical Properties:
Structure, Stability, Dynamic, Mechanic, Thermal, Magnetic, Optical properties of Nanomaterials



By

Dr.Botan Jawdat Abdullah

Asst Professor in Nanoscience