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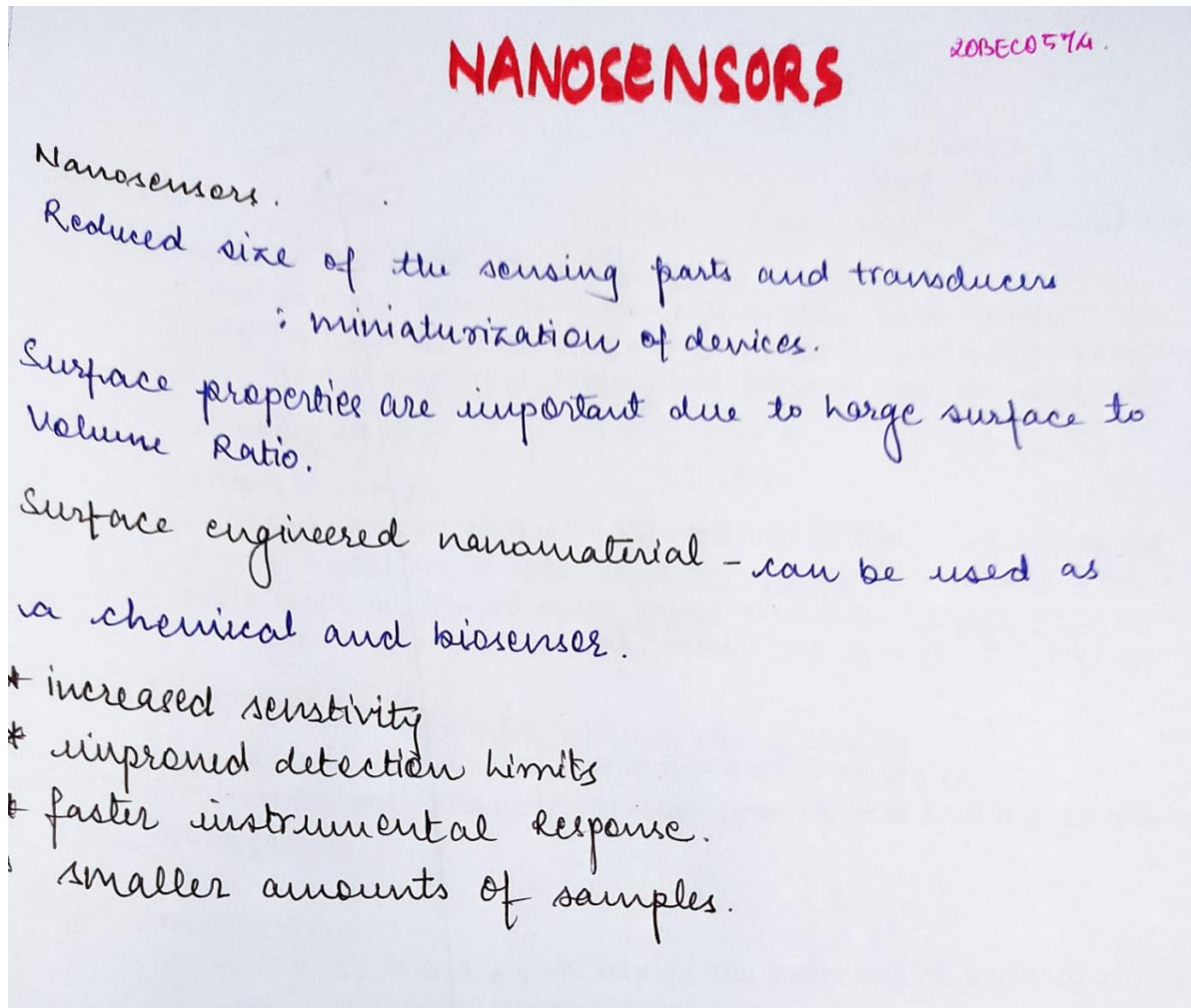
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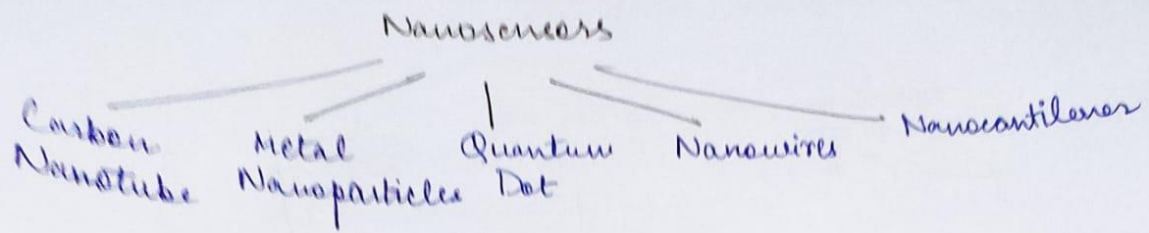
Introduction to Nanoscience and Nanotechnology

Digital Assignment 1

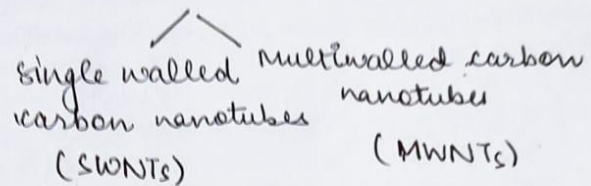
Nano sensors Overview

Introduction





Carbon Nanotube based Nanosensor



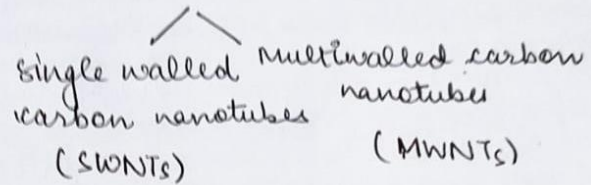
- * The advantages of CNT for chemical sensing
- Nano dimensions
 - Surface Chemistry
 - High Surface area.
 - Electronic properties.

Environmental Monitoring.

- * gas sensor
- * organophosphorus pesticides.
- * phenolic compounds
- * herbicides.

Carbon Nanotube Based Sensor

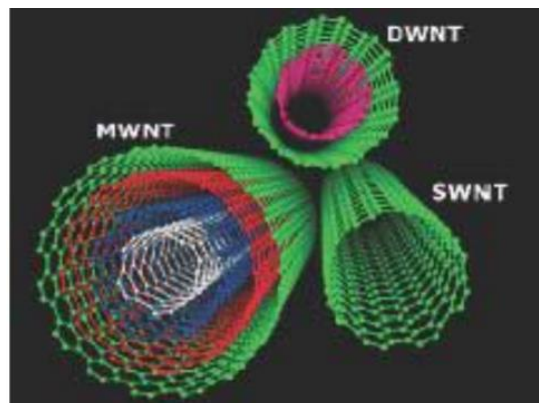
Carbon Nanotube based Nanosensor



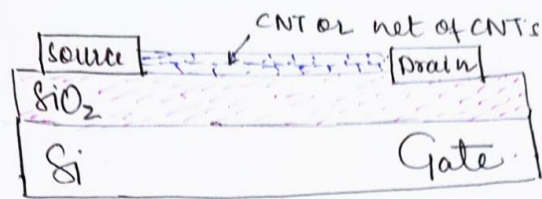
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Carbon Nanotube Field Effect Transistor

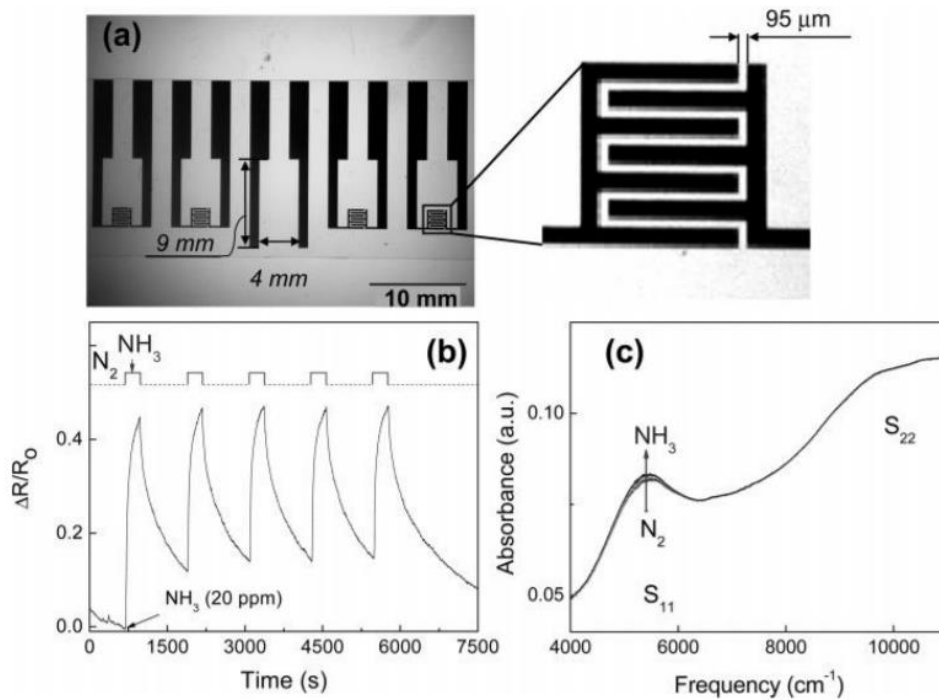


- Electrical properties of CNT.
sensitive to the effect of Charge Transfer and Chemical doping
- The Target molecule - changes in electrical conductivity
- high sensitivity.
- inability to identify analytes.

Carbon Nanotubes based Chemical Sensors

- functionalization process of the SWCNT's
- adsorption of human estrogen receptor (ER) - onto the SWCNTs network.
- SWCNT's are covered by PBSTG blocking solution.

Carbon Nanotubes Based Chemical Sensor



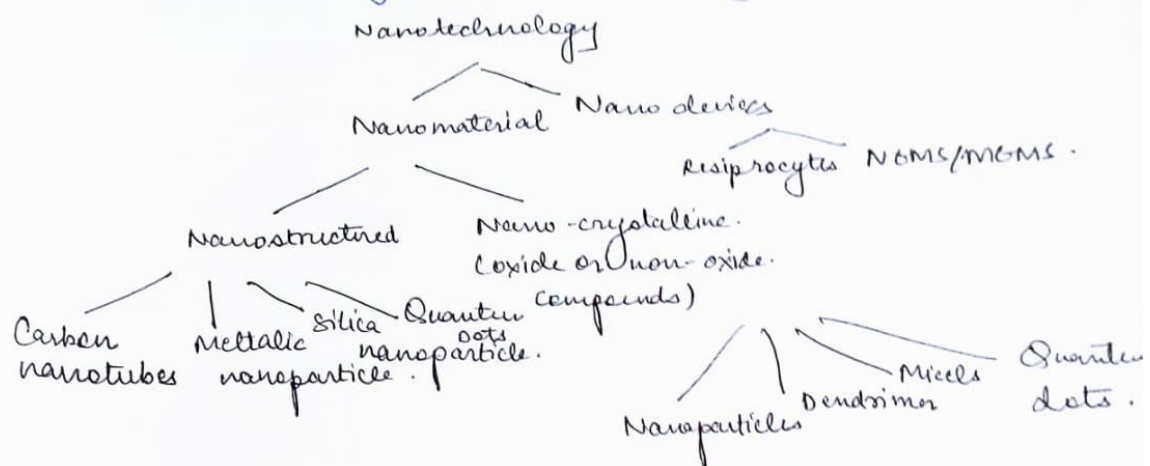
Carbon Nanotubes based Chemical Sensor

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Metal Nanoparticle

METAL NANOPARTICLE

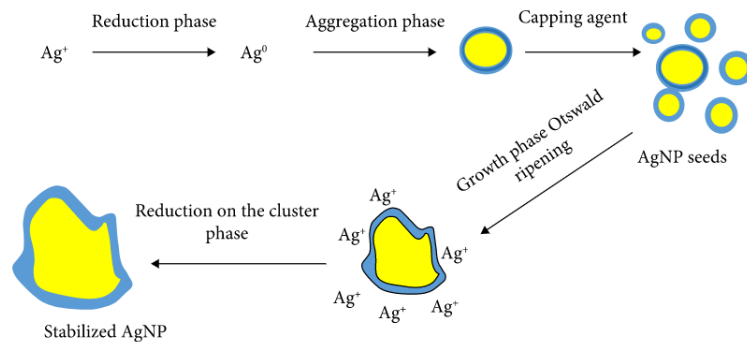
When Faraday prepared colloidal gold, named that time "divided metal". Later then the German microbiologist Robert Koch demonstrated that compounds with metal incorporated as gold inhibited the growth of bacteria.



Physical and Chemical Characteristics of Metal.

The ultrafine size of nanoparticle itself is one useful function. Thus, the fine particles are able to be absorbed more easily through the biological membrane and could be selectively through enhanced membrane to certain affected cells.

The ability is due to the large specific surface area of the nanoparticle which is an important characteristic which modifies reactivity and solubility. Sintering performance, related to the mass.



Synthesis Routes of Nanoparticles

* The method used for nanoparticles obtained are different even which are physical, chemical, biological or combination of two; the final characteristics of products are important such as to fully reply to the requirements. The methods used for synthesizing nanoparticles can be framed in two ways. Top bottom approach & bottom down approach.

Conclusion

Nanotechnology offers a great promise for the environment and Technology and is able to revolutionize many problems that our modern society is facing globally efficient, reduce waste and less greenhouse gas emission.

Nanomaterials based on Techniques and devices are on big drive worldwide. The properties of nanomaterial are inserted in various technologies and components to be exploited at high performance.

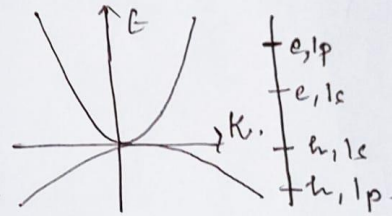
Quantum Dots

QUANTUM DOTS.

- * Quantum Dots are semi conductors that are on the nanometer scale.
- * Obey quantum mechanical principle of quantum confinement.
- * Exhibit energy band gap that determines required wavelength of radiation absorption and emission spectra.
- * Required absorption and resultant emission wavelength dependent on dot size.

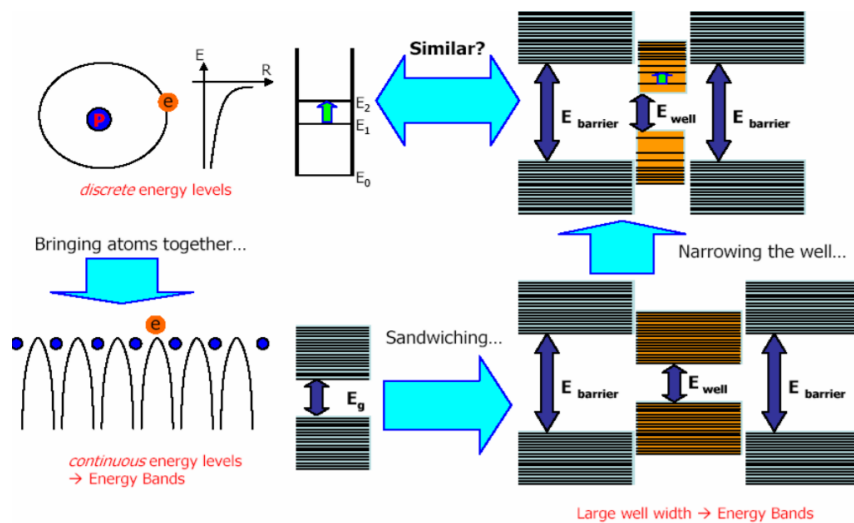
Description.

- The Emission and Absorption spectra corresponding to the energy band gap of the Quantum dot is governed by quantum confinement principles is an infinite square well potential.
- The Energy band gap increase with a decrease in size of quantum dot.



Quantum Dot LEDs

- Used to produce inexpensive, industrial quality white light.
- Marked improvement over traditional LED-phosphor integration by dot's ability to absorb and emit at any desired wavelength!
- Produce white light by intermixing red, green and blue emitting dots homogeneously within the phosphor difficult to accomplish with the traditional LED-phosphor set-up.



THANK YOU