

Nano Lect 1 – Questions and Keypoints

Key Points

1. What is nano technology:
 - a. Very small technology with device in the 1nm to 100nm range
 - b. Technology where Quantum Mechanics is the primary tool of analysis
2. Basic tools:
 - a. Electron microscopes (small wavelength). SEM/STM/AFM
3. Wide variety of structures and devices:
 - a. Carbon nanotubes and related structures
 - b. Single Electron transistors
 - c. Mechanical devices (speculative)
 - d. Electronic/photonic processing devices
4. Fabrication techniques
 - a. Self-assembly:
 - i. Use the properties of the material/molecules to organize themselves – energy minimization.
 - ii. Organic or inorganic
 - b. Lithographic/Stamping
 - c. Organic Synthesis
 - i. DNA – molecular biology
 - ii. Protein synthesis and self assembly
5. Example of very complicated organic molecule (Bacteriorhodopsin) that has lots of useful properties

Questions

1. Define nanotechnology. Is an nano ipod nano technology?
2. Why do we use a electron microscope to image nano-technology?
3. What is a carbon nanotube?
4. What is self-assembly at the molecular level and what drives it.
5. Give an example of nanotechnology.