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B27

Assignment - 5

Ans1) The confinement of the electrons means limiting their movement in a space with dimension of their de-Broglie's wavelength. The consequences of this confinement in space is the quantization of their energy and momentum. In this case they are subjected to principle of the quantum mechanical motion rather than classical mechanics.

The nanoparticle is the assembly of atoms of specific material that has few nanometer dimensions.

Because of this microscopic size the electrons are confined inside the particle. This is the same for the electrons in an atom they are confined and localized in atomic spaces.

In order to obtain the possible energy levels in the nanoparticle because of space confinement one has to use quantum mechanical laws. That is one has to solve the schrodinger equation with relevant boundary condition.

The motion of electrons in the confined spaces can be modeled by the motion of the particle in a potential well with infinite walls.

While the atom is modeled by one well with infinite wall with size of the atom, the electron in the quantum particles can be modeled by a potential well with infinite wall with the minimum energy level is that of the conduction band. Since we are interested in the confinement in the conduction band like wise we are interested in the holes in the valence band therefore, there will be an inverted well for the holes in the valence band.

Ans) Application in automobile industry:-

1) lighter but stronger material
2) Improved engine efficiency and fuel
9) Improved and multibrand electronic system
4) Better economics
5) Reduced environmental impact from hydrogen and fuel cell-powered cars.

* Nanotechnology for chassis and extension:-

Vehicle weight reduction is a key part of car manufacturer's strategies to improve fuel economy. From this work, a detailed analysis of the process relationship of aluminium alloy engine block has led to reduced engine weight and increased fuel efficiency.

* Nanotechnology in Tires

Tires are one of the easy application of nanostructured materials in automobiles. Carbon black was the first nanomaterial to be used by the automotive industry in tires as a pigment and reinforcing agent

* Nanotechnology for Automobile propulsion

Building an electric car needs to take into account four basic requirement - powerful and safe energy storage to give the car a sufficient driving range. Engines and associated all essence component that make best use of the stored onboard energy.