

Nanochemistry

Key words

Conductor: a substance which allows electrons to flow freely through it. Metals conduct electricity. A conductor will have electrons available in the arrangement of atoms which are free to move.

Insulator: a substance which will not allow electrons to flow through it. Substances like diamond, most plastics, wood and rubber are insulators. The arrangement of atoms in insulating substances does not have electrons which are free to move – they are all involved in bonds between atoms.

Semiconductor: a substance which allows electrons to flow freely under some conditions. The chemical element silicon is the most well-known semi-conductor. Pure silicon will not conduct electricity, but the structure can be changed or 'doped' by adding atoms of other elements like phosphorus, boron or gallium. The extra atoms have different numbers of electrons and change the structure. This makes electron movement possible. Other conditions like changing temperature or increasing pressure can make substances which are usually insulators conduct electricity. Scientists have made hydrogen gas into a metal by squeezing the molecules together under really high pressure!

Doping: adding extra atoms of another chemical element to a substance, eg adding phosphorus atoms to silicon. This changes how the substance conducts electricity.

