

## Editorial on Nanochemistry and its Applications

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### EDITORIAL

Nanochemistry is a branch of nanoscience that deals with the chemical applications of nanomaterials in nanotechnology. It involves the study of the synthesis and characterisation of materials of nanoscale size.

Nanochemistry is a relatively new branch of chemistry with the unique properties associated with assemblies of atoms or molecules of nanoscale (~1-100 nm), so the size of nanoparticles lies between individual atoms or molecules (the 'building blocks') and larger assemblies of bulk material which we are more familiar with.

#### Types of Nanotechnology:

**Dry nanotechnology:** It is used to manufacture structures in coal, silicon, inorganic materials, metals and semiconductors which do not work with humidity.

**Wet nanotechnology:** It is based on biological systems present in an aqueous environment which includes genetic material, membranes, enzymes and other cellular components

#### Examples and Applications of Nanotechnology:

Nanotechnology and nanomaterials are applied in many kinds of industrial sectors. They are usually found in the following areas:

**Electronics:** Carbon nanotubes are closely similar to silicon as a material in making smaller, faster and more efficient microchips and devices, as well as lighter, more conductive and stronger quantum nanowires. Graphene's properties make it suitable for the development of flexible touchscreens.

**Energy:** Recently developed semiconductors makes it possible to manufacture solar panels that double the amount of sunlight converted into electricity. Nanotechnology also lowers costs, produces stronger and lighter wind turbines, improves fuel efficiency.

**Biomedicine:** Certain properties of nanoparticles make it suitable in improving early diagnosis and treatment of neurodegenerative diseases or cancer. They are able to attack cancer cells selectively without harming other healthy cells. Some nanoparticles are also found enhance pharmaceutical products such as sunscreen.

**Environment:** Environmental friendly applications such as ions in air purification, nanofiltration systems in waste water. Nanocatalysts are also useful to make chemical reactions more efficient and less polluting.

**Food:** Nanobiosensors can be used to detect the presence of pathogens in food or nanocomposites to improve food production by increasing mechanical and thermal resistance and decreasing oxygen transfer in packaged products.

**Textile:** Useful in developing smart fabrics that don't stain or wrinkle, as well as stronger, lighter and more durable materials to make motorcycle helmets or sports equipment.

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