

## Editorial Note on Nanoparticles

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### EDITORIAL

Nanotechnology is a well-known research field of research from many decades. Many revolutionary advances are made in the field of nanotechnology. Nanotechnology produced materials of various types at nanoscale level. Nanoparticles are a large class of materials comprising particulate substances which has at least one dimension of less than 100 nm. These materials can be 0D, 1D, 2D, or 3D, depending on the overall appearance. The significance of these materials was recognized when researchers discovered that size would affect a substance's physiochemical properties, such as optical properties.

Based on their morphology, size and chemical properties, Nano Particles are broadly classified into different groups. Based on their physical and chemical appearance, some of the nano particles are categorized.

Fullerenes and carbon nanotubes (CNTs) represent two major classes of Carbon-based Nano particles. Fullerenes contain nanomaterial which is made of globular hollow cage such as allotropic forms of carbon. Due to their electrical conductivity, high intensity, structure, electron affinity, and flexibility, they have generated noteworthy commercial interest. These materials have pentagonal and hexagonal carbon units arranged in order, while each carbon is hybridized by sp<sup>2</sup>. Well-known C<sub>60</sub> and C<sub>70</sub> fullerenes with diameters of 7,114 and 7,648 nm.

Metal Nano particles are purely made of the metal's precursors. Nano particles possess a unique optoelectrical properties, so these are classified into a surface plasmon resonance. The nano particles are alkali and noble metals i.e. Cu, Ag and Au have a broad absorption band in the visible zone of the electromagnetic solar spectrum. The facet, size and shape will influence the controlled synthesis of metal Nano particles which is important in present day cutting-edge materials. The advantage in the optical properties, metal NPs find applications in many research areas. Gold Nano particles coating is widely used for the sampling of, to enhance the electronic stream, which helps in obtaining high quality scanning electron microscopy images.

Ceramics Nano Particles are non-metallic inorganic solids synthesized by heat and cooling in sequence. They can be found in shapes that are amorphous, polycrystalline, thick, porous or hollow. Therefore, because of their usage in applications such as catalysis, photocatalysis, photodegradation of dyes, and imaging applications, these Nano Particles

are attracting great attention from researchers.

Polymeric Nano particles are typically organic NPs and a special name polymer nanoparticle (PNP) collective is used in the literature for it. They are often in the form of nanospheres or nano capsules. The former are matrix particles whose mass is normally solid overall, and the other molecules are adsorbed at the spherical surface's outer boundary. In the latter case, the solid mass is completely encapsulated inside the particle. The PNPs are readily fictionalized in the literature and thus find bundles of applications

Nano particles contain lipid moieties dependent on lipids and are used successfully in many biomedical applications. Generally, a lipid NP with a diameter varying from 10 to 1000 nm is characteristically spherical. Like polymeric NPs, lipid NPs have a solid lipid centre and soluble lipophilic molecules contain a matrix. The external centre of these Nano particles has been stabilized by surfactants or emulsifiers. Lipid nanotechnology is a special area that focuses on the design and synthesis of lipid NPs in cancer therapy for different applications, such as drug carriers and delivery and release of RNA.