

Endohedral Nanostructures (Nano Structure) Can be Formed in Pure Form or a Combination of Several Different Materials

Dr.Afshin Rashid , Assistant Professor

Faculty member Islamic Azad University of Science and Research Branch, Tehran

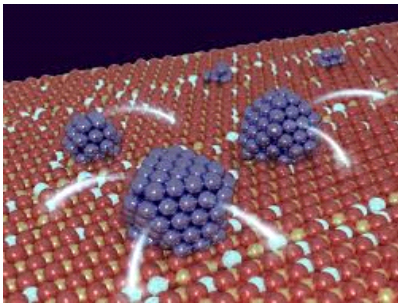
- **Abstract:**

- Materials that have nanometer size in all three dimensions and have no dimensions of freedom. According to some classifications, this category of endohedral nanostructures is also called nanoparticles. Factors affecting the properties of nanoparticles are the size and type of particles..

- **Keywords:** Nano structure , Nanoelectronic , Electromagnetic material , Nano material

Introduction •

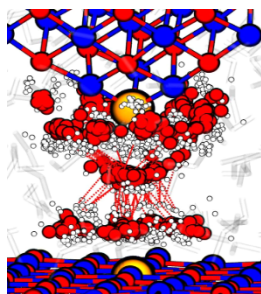
Nanoparticles have various applications in different industries such as automobiles (anti-scratching of the body, anti-fogging of windows, resistant rubbers, etc.), medicine (making new drugs, diagnosis of disease symptoms, etc.), water purification and sewage, electronics, military industries) etc. Nanoparticles can be made in different shapes depending on their application, such as spherical, elliptical, cubic, prismatic, columnar, etc. Nanoparticles may consist of one component or to be a combination of several material components. Also, nanoparticles can be pure or a combination of several different materials. This division of nanomaterials (endohedral nanostructures) is not an apparent and worthless division. These three types of nanostructures have fundamental differences both in terms of synthesis and production, and in terms of properties and applications. In general, the electrical, optical, magnetic, surface, etc. properties of these three structures are fundamentally different from each other, and of course their applications are also different. The main basis of nanotechnology is the use of materials. Every material in space has three dimensions: length, width and height. If in a material at least one of these three dimensions is in the range of nanometers, it is called a material, a nanostructure.



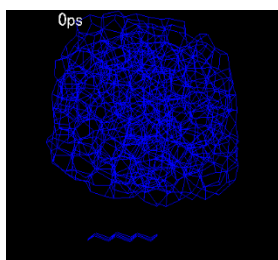
There is no accepted definition for the nanometer range, but a more acceptable definition is a range between one and one hundred nanometers. Even with dimensions of several hundred nanometers in a material, it is still called an endohedral nanostructure . In fact, the definition of the area is 1 to 100 nm to have a definition and standard.

Investigating more electrical conductivity in the particles of endohedral Nano structure nanostructures •

The importance of miniaturizing mutant nanomaterials to nanometer dimensions is the change of some known material properties. The structure of nanomaterials (mutant) Mutant nanomaterials is the importance of the nanoscale in changing the properties and characteristics of materials in these dimensions. Properties such as strength, flexibility, electrical conductivity, magnetic properties, color, reactivity, etc. Starting to change the properties of the material by shrinking it depends more on the type of material and the desired property. For example, by reducing the dimensions of a nanoporous material, generally some mechanical properties of the material such as strength are improved. This increase in strength does not happen only in the range of a few nanometers, and it is possible that the strength of materials of a few tens or even hundreds of nanometers is much higher than that of large-scale mass materials. On the other hand, the change of some properties such as color and magnetic properties may occur in dimensions of only a few nanometers.



"Scales in atomic, molecular and macromolecular dimensions" in the definition of nanoelectronics science and "nanometer scale" in the definition of nanotechnology. In the definition of nanoporous logic, every material consists of three dimensions. If at least one of these dimensions is on the nano scale (between 0 and 011 nm), this material is called a nanoporous material. Also, the dimension that is not on the nano scale is called the free dimension, because any value can be Graphene is one of the most useful materials in the structure of nanoporous materials in the production of nanoelectronic chips and parts.



Apart from changing material properties, there are other interesting features in nanoporous nanostructures. If nano materials can be produced atom by atom and with desired shape and structure. Also, nanomaterials have a much higher surface-to-volume ratio compared to bulk materials. This is a very important property that is extremely important in all processes that occur on the surface of materials (such as reactivity). So, it can be concluded that nano does not only mean a thousand times smaller than micro. Also, nano technology is also Microtechnology is not the only extension to a smaller scale. Nanotechnology is a completely new paradigm that opens many opportunities for electronics and other sciences.

References :

- Review of: \nanodipole L/d is significantly reduced, it cannot be used". (2024). Qeios. <https://doi.org/10.32388/y5s2db>
- Review of: \Application of Nano Wires Nano Wire by Electron Nano Lithography". (2023). Qeios. <https://doi.org/10.32388/13md1n>
- Review of: \The concept of (Nano assembler)". (2023). Qeios. <https://doi.org/10.32388/xrrt0e>
- Review of: \The degree of order and dimensions of nanowires produced using templates". (2023). Qeios. <https://doi.org/10.32388/7siu3m>

Review of: \It has been done in the manufacture of nanowires through regular one-dimensional arrays with the help of different physical and chemical methods". (2023). Qeios. <https://doi.org/10.32388/pg9m4t>Review

Review of: \Tubular nanotransistors (3D) Very high electron mobility in graphene". (2023). Qeios. <https://doi.org/10.32388/ik4l3i>

Review of: \ (Nano-Electronics - Plasmonic Technology) in the design of nano-devices such as nano-transistors and nano-diodes, nano-switches and nano-logic gates". (2023). Qeios. <https://doi.org/10.32388/7pndul>