



# International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

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## Study on Nanotechnology

Mahalakshmi P

Department of Electrical Engineering, Galgotias University, Yamuna Expressway Greater Noida, Uttar Pradesh, India

Email Id: mahalakshmi@Galgotiasuniversity.edu.in

**ABSTRACT:** Nano electronics is the use of nanotechnology in electronics, and Nano means very small range which is not visible with naked eye. Nano itself shows a various group of device and material or instrument, equipment they all have at least one similar or common behavior that they are very small in size, their size is that much small that their interatomic interaction and quantum mechanical properties have to study. Nanotechnology is a very diverse word/term that covers many fields like science, research and technology. Nanotechnology is also used in the food industry, information technology and electronics. Nanotechnology is related to work with small things and on small operations. In this paper one of the nanoparticles called cantilever discussed, also application, drawbacks and its impact and necessity in future also discussed. Cantilever has different output while changing its energy level, this phenomenon also shown in this paper. Nanotechnology field of work includes study, design, manipulation, manufacture and controlling of material or device or equipment by physical or chemical means, nanotechnology has been used at various purposes like in industry, in the medical line. Many treatment devices, also nanotechnology used to cure cancer, nanotechnology only attack cancer bacteria or cells without affecting healthy tissue, also nanotechnology can be used in pharmaceutical products mainly in sunscreen. In this research paper discussed the study behind nanotechnology and its use how nanotechnology can be used for other purposes such as industry and medical sector.

**KEYWORDS:** Small, Micro, Molecular study, Nano electronics, quantum dots, nanoscale, quantum size effect, fullerene, quantum computers

### I. INTRODUCTION

Nanotechnology is basically the study of molecules, the field of search shows that it is manipulation, design, and production of matter. Different types of force are applied on atoms and molecules so that their properties can change according to the need of industry, the size of particles is very small in nanometers and study of this is very complex so scientists and engineers are busy solving the complexity of atoms and their bonds. Nano electronics is the use of nanotechnology in electronics, and nano means very small range which is not visible with naked eye. Nano itself shows a various group of device and material or instrument, equipment they all have at least one similar or common behaviour that they are very small in size, their size is that much small that their interatomic interaction and quantum mechanical properties have to study. Nanotechnology is a very diverse word/term that covers many fields like science, research and technology. Nanotechnology is also used in the food industry, information technology and electronics. Nanotechnology is related to work with small things and on small operations.

Nanotechnology is the study based on nanoparticles; Fig. 1 shows the structure and design of nanoparticle it's basically for the molecules and atoms of any matter, there are many different types of nanoparticle presents and all nanoparticle have different industrial application, among all the nanoparticle one nanoparticle named cantilever has been discussed in this paper also its application and output of the application shown in this paper. Nanotechnology can be defined as the tool of measurement, prediction and construction of materials of different properties by playing or changing their atomic or molecular behaviour, the scale of their change is in nanometers. Atoms and groups of atoms called molecules are very small in nature also their small size creates complexity in work so scientists and engineers are trying to take control of these small particles also they take control over atoms and molecules individually, manipulating them to use with an extraordinary degree of precision.



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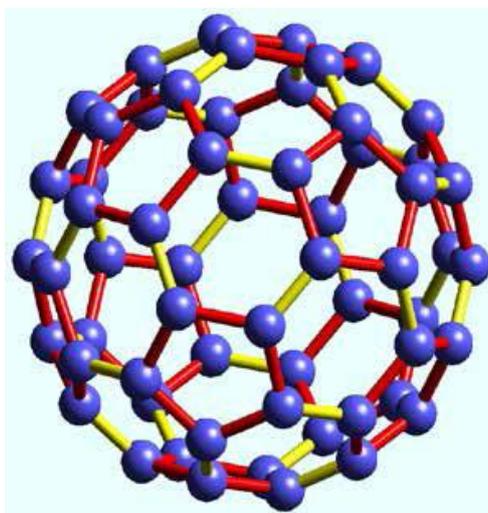


Fig. 1: Nanoparticles

Nanotechnology has different application and potential field of work like it is also used in textile such as

- Antibacterial/ odor control
- Computing
- UV blocking
- Strength enhancement
- Wrinkle resistance
- Antistatic properties
- Sensors
- Optical displays
- Water repellent

## II. LITERATURE REVIEW

Many research paper has been published in the field of nanotechnology and its application in medical and industrial process in a research paper titled An introduction to nanotechnology and its implications by Shree KantaSubedi Department of physics, Prithivi Narayan campus, Pokhara discuss about the study of nanotechnology and historical background of nanotechnology in which discuss the use and need of nanotechnology in medical and industrial purpose, scale of different things which can be measure in nanometer, nanometer basically the study of molecule and it will work in nanometer, study of use of nanotechnology in medicine & drug delivery in which discussed about the how nanotechnology can help in medicine and their deliver. Nano particle like carbon nanotube and buckyball has been shown in this paper, nanotechnology can use in many sector one of that sector is energy sector, nanotechnology also have very vast career and opportunity so this is used in development of quantum computer, reactivity and strength of materials can also measure by nanotechnology, there is adverse effect of every technology so in this paper adverse effect of nanotechnology also discussed.

In a research paper titled Overview of Nanoelectronic Devices by DAVID GOLDHABER-GORDON, MICHAEL S. MONTEMERLO, J. CHRISTOPHER LOVE, GREGORY J. OPITECK, AND JAMES C. ELLENBOGEN discussed the molecular structure which has been studied in nanotechnology, also discussed the different size of the particle which comes under which range of nanotechnology, in this paper discussed about the solid-state quantum-effect and single-electron devices, molecular electronic devices. Which work on the principle of nanotechnology, Also discuss structure and operation of a MOSFET, Obstacles to Further Miniaturization of FET's, solid state quantum effect and single electron nanoelectronic device, discussed the study of RTD (resonant tunneling diode), graph and structure, taxonomy of nanoelectronic devices, molecular electronic switching devices. This research paper also discusses the



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electronics molecules in which give brief knowledge about the type of technology used for study of molecules, and discusses the different method and view of material using nanotechnology.

In a research paper titled Highlights from the Nanoelectronics for 2020 and Beyond (Nanoelectronics) NSI in this paper discussed the concept for future high-performance hybrid nanophotonic chips with neat diagram of the same, Reversible molecular switch synthesized by Bissel et al. Ring-like “bead” molecules slide along wire-like chain molecules to perform switching functions as described in the text. Nanotechnology also used to operate the big operation by changing small molecules' behaviour on a very small stage so in this research paper Reversible molecular switch synthesized by Bissel et al. Ring-like “bead” molecules slide along wire-like chain molecules to perform switching functions as described in the text.

### III. CONCLUSION

Nanotechnology is the study based on nanoparticles; it's basically for the molecules and atoms of any matter, there are many different types of nanoparticle presents and all nanoparticle have different industrial application, among all the nanoparticle one nanoparticle named cantilever has been discussed in this paper also its application and output of the application shown in this paper. Nanotechnology can be defined as the tool of measurement, prediction and construction of materials of different properties by playing or changing their atomic or molecular behaviour, the scale of their change is in nanometers. Atoms and groups of atoms called molecules are very small in nature also their small size creates complexity in work so scientists and engineers are trying to take control of these small particles also they take control over atoms and molecules individually, manipulating them to use with an extraordinary degree of precision. Application of nanotechnology is very vast in the field of engineering, medical and industrial application because atomic control is a very good and effective tool for the future. Nanotechnology has the power to spark and change us from our head to toe by applying and bringing many complex changes in us. Nanotechnology brings many complex and hard interactions occurring at a very small level. If it grows at the current rate, nanotechnology will touch the life of nearly every person on the planet in the next few years and it will be the greatest advancement in earth's history.

### REFERENCES

- [1] Low J, Yu J, Ho, W. (2015). Graphene-Based Photocatalysts for CO<sub>2</sub> Reduction to Solar Fuel. The journal of physical chemistry letters, 6(21): 4244- 4251.
- [2] Chaturvedi S, and Dave PN (2014).Emerging applications of nanoscience. Paper presented at the Materials Science Forum, 152-159.
- [3] Jalaja K, Naskar D, Kundu S.C, James NR. (2016). Potential of electrospun core–shell structured gelatin–chitosan nanofibers for biomedical applications. Carbohydrate polymers, vol. 136, 1098-1107.
- [4] Najim M, Modi G, Mishra YK, Adelung R, Singh D, Agarwala V. (2015). Ultra-wide bandwidth with enhanced microwave absorption of electroless Ni–P coated tetrapod-shaped ZnO nano- and microstructures. Physical Chemistry Chemical Physics, 17(35): 2923-2933.
- [5] Maine E, Thomas V, Bliemel M, Murira A, Utterback J. (2014). The emergence of the nanobiotechnology industry. Nature nanotechnology, 9(1): 12-15.
- [6] Pratsinis SE. (2016). Overview-Nanoparticulate Dry (Flame) Synthesis & Applications. UNE, 13-15.
- [7] Sabet M, Hosseini S, Zamani A, Hosseini Z, Soleimani H. (2016). Application of Nanotechnology for Enhanced Oil Recovery: A Review. Paper presented at the Defect & Diffusion Forum.
- [8] Low J, Yu J, Ho, W. (2015). Graphene-Based Photocatalysts for CO<sub>2</sub> Reduction to Solar Fuel. The journal of physical chemistry letters, 6(21): 4244- 4251.
- [9] Chaturvedi S, and Dave PN (2014).Emerging applications of nanoscience. Paper presented at the Materials Science Forum, 152-159.
- [10] Jalaja K, Naskar D, Kundu S.C, James NR. (2016). Potential of electrospun core–shell structured gelatin–chitosan nanofibers for biomedical applications. Carbohydrate polymers, vol. 136, 1098-1107.