

NANOTECHNOLOGY-A REVOLUTION

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ABSTRACT

Nanotechnology is currently the most demanding technology that affects nearly all aspect of our day-to-day lives. Without realising it, we utilise things made possible by nanotechnology on a daily basis. Nano science is a branch of nanotechnology, it the study of science, engineering, and technology at the nano scale. Its main focus is on comprehending and managing matter at the nano scale. The sizes range from around one to one hundredth nanometres.

The use of nanotechnology is greatly advancing, if not revolutionising in various fields. Among the industries are information technology, homeland security, healthcare, energy, and transportation and numerous others like environmental science and so on. The primary concern of this paper is to explore Nanotechnology and its applications.

KEYWORDS

Nanotechnology, information technology, healthcare, transportations.

INTRODUCTION

Nanotechnology is the science of designing, manufacturing, and using structures and devices with one or more dimensions of one hundred million thousandths (100 nanometres) or less. At this size, materials begin to exhibit unique characteristics that influence their physical, chemical, and biological behaviour. Nanotechnology has the potential to have a significant impact on society. In addition, nanotechnology can also be used to reduce environmental pollution.

NANOTECHNOLOGY IN IT

Nanotechnology has greatly contributed to major advances in information technology, resulting in faster, smaller, and more portable systems that can manage and store ever-increasing amounts of data. Nanotechnology now supports the production of modern computer chips and the development of new chip technologies for the post-silicon era, the development of new materials for many nano-electronic and nano photonic applications, new nano bioelectronic sensors and countless other applications.

NANOTECHNOLOGY IN MEDICINE

The discovery of nanotechnology and nanomedicine is very broad and far-reaching. Nanomedicine has brought about amazing changes, taking medicine to a new level with significant health benefits. The great potential of nanotechnology in health needs to be explored. In medicine, great research continues into the best methods and techniques, including nephrology, genetics for the treatment of heart disease, and cancer therapy.

Traditional treatments have made great strides, and nanoparticles and nanotechnology have improved in quality, showing promising results in 20-21. The nanobots target specific cancer cells and send data back to a smartphone to ensure the patient receives the right treatment. Nanotechnology offers the potential for in-vitro diagnostics by replacing existing methods with inexpensive and easy-to-use methods. Nanoparticles can act as molecular imaging agents in a device that can detect cancer-related genetic alterations and tumour functional characteristics.

In addition, nanotechnology-based coatings often contain nanomaterials such as titanium dioxide, silicon dioxide, carbon black, iron oxide, zinc oxide, and silver, depending on the job required. The tools and methods improve the evaluation, safety, and efficiency of the physical properties of nanomaterials and nano surfaces incorporated into medical device engineering. Scientists play an important role in product development, including new materials, sensors and energy storage systems.

NANOTECHNOLOGY IN TRANSPORTION VEHICLES

Nanotechnology is gaining more attention and is being used in parts of transportation vehicles. Nanomaterials can improve the safety and durability of transportation vehicles thanks to their unique physical and chemical properties.

It describes nanotechnology and how it can be used to improve the comfort, safety and speed of transportation. New developments and applications of nanotechnology in the transportation industry, including nano-coatings, nano-filters, carbon black for tires and nanoparticles to improve engine performance and reduce fuel consumption.

It also highlights key challenges in a range of applications, such as environmental, health and safety issues. Many nanomaterials have shown excellent performance and have been widely studied, making them candidates for environmentally friendly transport applications.

NANOTECHNOLOGY AND ITS APPLICATIONS

1.) ENERGY APPLICATIONS

Nanotechnology is finding application in customary energy sources and is significantly improving elective energy ways to deal with assistance meet the world's rising energy requests. Numerous researchers are investigating ways of growing perfect, reasonable, and sustainable power sources, alongside means to diminish energy utilization and decrease poisonous loads on the climate.

Nanotechnology is working on the productivity of fuel creation from crude petrol materials through better catalysis. It is likewise empowering diminished fuel utilization in vehicles and power plants through higher-effectiveness ignition and diminished grating.

Nanotechnology is additionally being applied to oil and gas extraction through, for instance, the utilization of nanotechnology-empowered gas lift valves in seaward activities or the utilization of nanoparticles to recognize minute down-well oil pipeline breaks.

Scientists are creating wires containing carbon nanotubes that will have a lot of lower opposition than the high-strain wires at present utilized in the electric framework, subsequently decreasing transmission power misfortune. Nanotechnology can be integrated into sun powered chargers to change daylight over completely to power all the more proficiently, encouraging reasonable sun-oriented power from now on.

2.) ENVIRONMENTAL REMEDIATION

Notwithstanding the manners in which that nanotechnology can assist with further developing energy effectiveness there are additionally numerous ways that it can help recognize and tidy up ecological pollutants. Nanotechnology could assist with addressing the requirement for reasonable, clean drinking water through fast, minimal expense discovery and treatment of debasements in water. Engineers have fostered a dainty film layer with nanopores for energy-proficient desalination.

This molybdenum disulphide (MoS₂) layer sifted two to multiple times more water than momentum traditional channels. Nanoparticles are being created to clean modern water contaminations in ground water through substance responses that render the poisons innocuous. This interaction would cost not as much as techniques that require siphoning the water out of the ground for treatment. Specialists have fostered a nano-texture "paper towel" woven from little wires of potassium manganese oxide that can retain multiple times its weight in oil for cleanup applications.

Analysts have likewise positioned attractive water-repellent nanoparticles in oil slicks and utilized magnets to eliminate the oil from the water precisely. Numerous plane lodge and different kinds of air channels are nanotechnology-based channels that permit "mechanical filtration," in which the fibre material makes nanoscale pores that trap particles bigger than the size of the pores. The channels likewise may contain charcoal layers that eliminate smells.

3.) EVERYDAY MATERIALS AND PROCESSES

Nanoscale additives in the surface treatment of fabrics can reduce the energy for personal defence or help prevent wrinkles, stains and bacterial growth. Nanoscale transparent films on glasses, computer and camera screens, windows and other surfaces can provide water and debris repellent, anti-reflective, self-cleaning, anti-ultraviolet or infrared, anti-fog, anti-bacterial, anti-scratch or electric shock.

Nanoscale materials are beginning to evolve into durable, washable "smart fabrics" with flexible nanoscale sensors and electronics capable of monitoring health, capturing solar energy, and harvesting force through movement. Electric cars, trucks, planes, ships and spacecraft can save a lot of fuel.

Nanoscale additives are used in polymer composites in baseball bats, tennis rackets, bicycles, motorcycle helmets, auto parts, luggage, and electronic equipment buildings to make them lighter, stronger, longer, and more durable.

Carbon nanotube sheets are currently being developed for use in future aircraft. For example, the combination of light weight and portability makes it ideal for applications such as electrical insulation and thermal management.

ADVANTAGES	DISADVANTAGES
Nanotechnology in computer and electronics	Health Problems
Coating made of Nano-Particles	Decreased in Employment
It is Feasible to Cure Illnesses to a Large Extent	Costly
Nanotechnology has Greatly Enhanced Medical Fieldwork	Weapons that are Dangerous and Easily Accessible

CONCLUSION

As A Part of Our Research Paper “Nanotechnology A - Revolution”, We Have Presented a Briefly Explored Concepts of Nanotechnology, The Applications of Nanotechnology. We Have Given on How the Nanotechnology Can Help Improve the Different Sectors. Advantages And Disadvantages of it.

REFERENCES

- <https://www.javatpoint.com/advantages-and-disadvantages-of-nanotechnology>
- <https://www.sciencedirect.com/science/article/pii/S2773064622000068>
- <https://education.nationalgeographic.org/resource/nanotechnology/>
- <https://www.nano.gov/about-nanotechnology/applications-nanotechnology>
- <https://www.sciencedirect.com/science/article/pii/S2414644723000337#bib0025>
- <https://trynano.org/transportation-applications/>