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Roll and Need of Nanoparticles and Nanotechnology in Modern World: A Review

[1]Mr. Amit Kumar, [2]Mr. Darshan Lal and [3]Ms. Komal

Department of Physics, Pt. Chiranji Lal Sharma Govt. College, Karnal, India.

Abstract

In modern world life can't be imagined without nanoparticles and technology based upon it. There is a wide range of technologies which is based upon nanoparticles. The roll of nanotechnology depend on the fact that it is possible to construct the structures of materials at very small scales to get required properties, thus greatly exploring the materials science toolkit. Using nanotechnology or nanoparticles, objects can effectively be made powerful, lighter, more durable, more effective, more sieve-like, or better electrical conductors, among many other qualities. A large number of daily consumable money-making goods are currently in the market and in daily use that rely on nanoscale materials. Nanoparticles and technology is very important in food material daily consumable bioactive compound and flavors. It is necessary to invest in Nanotechnology industry to improve the standard and comfort of the society in every sector. It will reduce the production cost, production time, increase the income and enhance the quality of every product of every industry.

Keywords: Nanoparticles, Nanotechnology, Consumable, Nanoscale

INTRODUCTION

Nanoparticles are the particles of size range lies between 1 nm to 100 nm (diameter). And the word Nanotechnology is made up of two words Nano and Technology, Nano means one billionth of the quantity. Simply we can say that Nanotechnology as manufacturization and utilization of materials made up of nanoparticles. Nanotechnology is a known field of research since last century. Since "nanotechnology" was presented by Nobel laureate Richard P. Feynman during his

well famous 1959 lecture "*There's Plenty of Room at the Bottom*" (Feynman, 1960), there have been made various revolutionary developments in the field of nanotechnology. Existence of nonmaterial can be seen in all types of dimensions like zero, one , two or three due to its structure. Nanotechnology has the potential to produce many new material sand devices with wide-ranging applications, such as in medicine, electronics, and energy production. On the other hand, nanotechnology raises many of the same issues as with any introduction of new technology, including concerns about the toxicity and environmental impact of nonamaterial , and their potential effects on global economics, as well as speculation about various doomsday scenarios.

So, in this article an attempt has been made to summarize the environmental Applications and Implications of Nanotechnology.

Rolls of Nanotechnology

Nanotechnology has the capacity to get better our capability to prevent, detect, and remove environmental contaminants in air, water, and soil in a cost effective and environmentally friendly approach. Some possible future roll, applications and needs of nanotechnology which have the potential to benefit the environment are listed below:

1. Roll of Nanotechnology in society

Beyond the toxicity risks to human health and the surroundings which are related with first-generation nanomaterials, nanotechnology has broader social impact and poses broader social challenges. Social scientists have suggested that nanotechnology's social issues should be understood and assessed not simply as "downstream" risks or impacts. Rather, the challenges should be factored into "upstream" research and decision-making in order to ensure technology development that meets social objectives.

Many social scientists and organization in civil society suggest that technology appraisal and governance should also involve community participation. Nanotechnologies may provide new solutions for the millions of people in developing countries who lack permission to basic services, such as protected water, consistent energy, health care, teaching and learning. The 2004 UN Task Force on Science, Technology and Innovation noted that some of the recompense of nanotechnology includes production using little effort, land, or maintenance, high output, low outlay, and reserved requirements for materials and energy. However, concern are regularly raised that the claimed payback of nanotechnology will not be evenly disseminated, and that any payback (including technical and/or economic) linked with nanotechnology will only reach affluent nations.

Mini sensors developed through nanotechnology could be used to identify exact pollutants by chance or with intent released into the environment. Intelligent

biosensor networks could perform the task of monitoring water quality, as well as localized detection of sources of pollution.

2. Roll of Nanotechnology in Medical

A lot of Nanomedicines are the medical application of nanotechnology. The approaches to Nanomedicines range from the medical use of nanomaterials to nanoelectronics biosensors, and even possible future applications of molecular nanotechnology. Nanomedicines seek to deliver a precious set of research apparatus and clinically helpful devices in the near future. The National Nanotechnology program expects new viable applications in the pharmaceutical production that may contain advanced drug delivery systems, new therapies, and in vivo imaging. Neuro-electronic interfaces and other nanoelectronics-based sensors are another active goal of research. Further down the line, the approximate field of molecular nanotechnology believes that cell repair machines could modernize medicine and the medical ground.

As one can observe the health cosuma e.g. toothpaste, telecom powder, shampoos, coatings and paints, inks and tonners, tooth brush, comb ,fibers a very large list can be made which all are available made up of nanoparticles. Nanotechnology is quickly growing and a large number of everyday goods on the world market contain nanomaterials. Look for instance at the development of better and more efficient batteries, surface coatings, anti-bacterial clothing, cosmetics, and food products. Nanoparticles are very different from their daily counterparts, so their adverse effects cannot be derived from the known toxicity of the macro-sized material. This poses considerable issues for addressing the health and environmental impact of free nanoparticles.

3. Roll of Nanotechnology in Environment

Green nanotechnology refers to the use of nanotechnology to improve the environmental sustainability of processes producing negative externalities. It also refers to the use of the products of nanotechnology to increase sustainability. It includes manufacture green nano-products and using Nano-products in maintain of sustainability. Green nanotechnology has been described as the development of new technologies "to reduce potential environmental and human health risks connected with the produce and use of nanotechnology goods, and to encourage substitute of existing products with new Nano-products that are more environmentally friendly right through their life cycle.

Due to increasing use of nano-Al_2O_3 materials in both commercial and military applications, additional studies are needed to determine the fate and transport of this material in terrestrial and water ecosystems.

A study at the University of Rochester establish that when rats breathed in nanoparticles, the particles settled in the brain and lungs, which led to major increases

in biomarkers for inflammation and stress response.

A most important study published more recently in Nature Nanotechnology suggests some forms of carbon nanotubes – a poster child for the "nanotechnology revolution" – could be as dangerous as asbestos if inhaled in sufficient quantities.

A newspaper article reports that workers in a paint factory developed serious lung disease and nanoparticles were found in their lungs which causes harmful diseases in the workers body.

REGULATION

The point of this information request will be to classify information regarding implications of nanotechnology and regulation regarding this.Major debate exists relating to the question of whether nanotechnology or nanotechnology-based goods merit special government regulation. This debate is related to the conditions in which it is necessary and suitable to assess new substances previous to their release into the marketplace, society and environment. There has been much debate on the future implications of nanotechnology. These concerns have led to a debate among advocacy groups and governments on whether special regulation of nanotechnology is warranted.

There is no international regulation of nanoproducts or the underlying nanotechnology. Nor are there any internationally agreed definitions or terminology for nanotechnology, no internationally agreed protocols for toxicity testing of nanoparticles, and no standardized protocols for evaluating the environmental impacts of nanoparticles. So, with the advancement of this technology, there arises a need of the hour to regulate the production, handling, labeling and disposal of nanomaterials in the environment.

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