



OVERVIEW OF ENVIRONMENTAL IMPACT OF NANOTECHNOLOGY

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ABSTRACT

As we know nanotechnology is an emerging field. Beside their potential economic values the benefits offered by nanomaterial are expected to have significant impacts on almost all sectors of the industry (e.g. medicine, energy, aerospace, plastic & electronics). Due to its versatility & its application there is great debate regarding to what extent industrial and commercial use of nanomaterial's will effects on our ecosystem.

No doubt nanotechnology increase the strength of many materials and devices, as well as enhance efficiencies of monitoring devices, but in term of environmental impact of this technology may increase toxicological pollution on the environ due to uncertain shape, size and chemical composition of some of the nanomaterial's. ENT

In this paper we will discuss the knowledge of environmental factors to all scientist, engineer, policymakers, academicians & professional who are working on this field will be beneficial to us.

INTRODUCTION

Nanotechnology is the creation of useful/functional materials, devices and system (of any useful size) through control/manipulation of matter on the 1-100nanometers length scale and exploitation of novel phenomena(physical,chemical,electrical,mechanical,optical & magnetic) & properties which arise because of the nanometer length scale.

Environmental impact of nanotechnology can be split into two categories, first is potential for nanotechnology innovation to help improve the environment and possibly novel type of pollution that Nano technical materials might cause if release into the environment.

Application utilizing of nanotechnology includes manufacturing various products, measuring, imaging and manipulating matter on the Nano scale and in the field of Nano composites, bio composites, optical, biomedical



electronic manufacturing, aircraft and wind energy. If we compared Nano scale material with bulk material than we can analysis that Nano scale material can have different properties compared to bulk material for basically two reasons. First one is Nano scale particles have relatively large surface area per unit mass which is critical factor to increase mechanical modules and other physical and chemical properties.

Second one is the basic material properties are changed at Nano scale due to the dominance of quantum effects and lesser imperfections.

Practically, nanotechnology devices consume less energy, reduced material waste, and help in monitoring. And this technology can also be used to reduce and prevent the toxically of nanoparticles in environment more efficiently. Evaluation of positive and negative impacts of nanotechnology is very essential for the safety of our society.

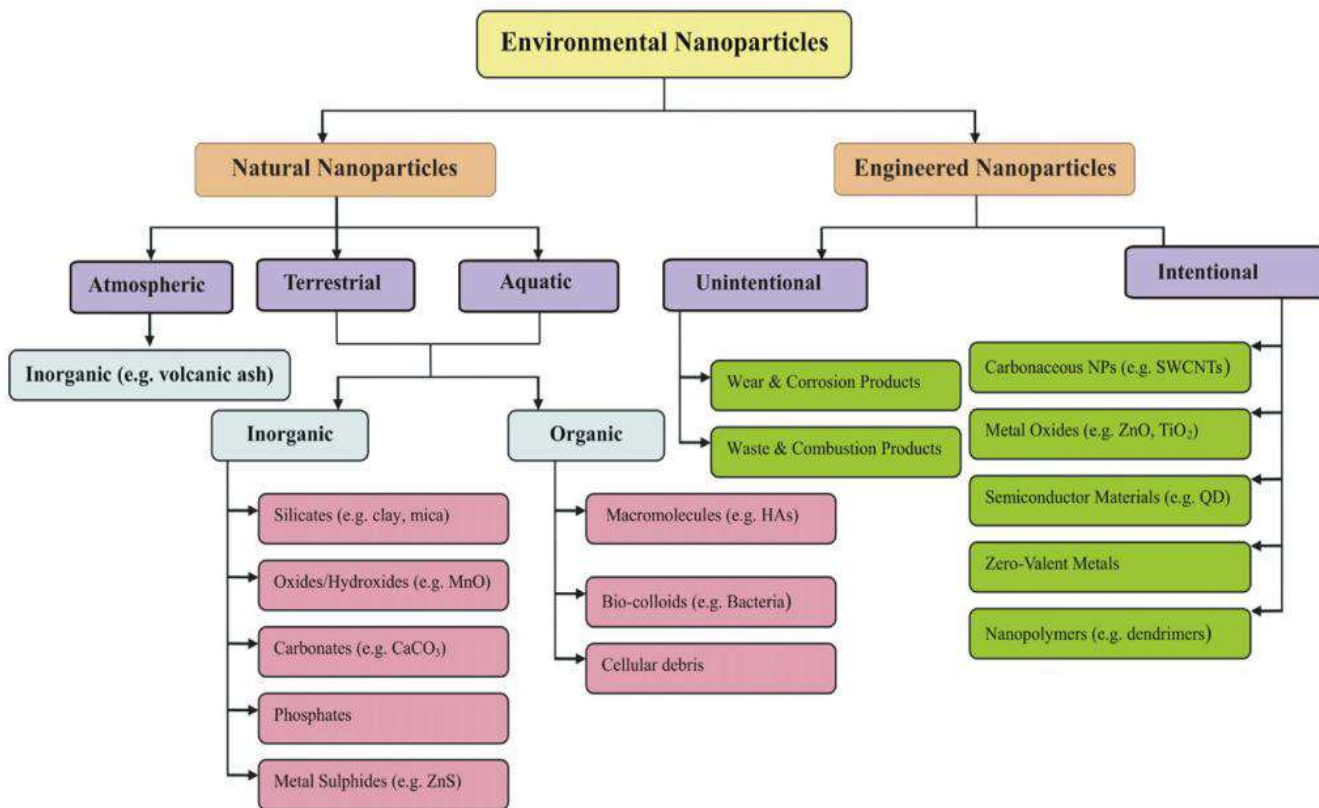
POTENTIAL ENVIRONMENTAL EFFECTS

According to “Robyn Griggs Lawrence” Nanotechnology is harmful to the environment and our bodies. We all know Nanotechnology are in all kinds of products from personal care to clothing to food and the process of manipulating of matter at one billions of a meter, allows material to be stronger and tend to products more durable. But here a question arise is that, these tiny particle is bad for our environmental and for our health. Answer may be yes, because nanoparticles are so small, they can leach into our skin and these tiny particles can cause all sorts of problems, continuously working is going on this technology regarding environment.

Recent studies have shown that Nanoparticles can damage lung cell, suppress immunity and carry health risk etc. In recent research, scientist also tells that Nanoparticles used in sunscreen and other personal care products have also been shown to harm bacteria and soil microbes etc.

We know Nanoparticles have higher surface area then the bulk materials which can cause more damage to the human body and environment compared to the bulk particles.

A process of nanotubes can have harmful impacts on the environment nanomaterial's are considered a wonder material but excess amount of this can be a harmful impact on our environment.



ENVIRONMENTAL ANALYSIS

Many scientist like Marcono D.C, salas E.c.etal and Kotchey G.P worked on Nano scale inclusion(Graphene oxide GO) which they try to work out that how to improve the process of efficiency and produce less toxic emission .Similarly many scientist related to this technology are continuously working on how to reduce the Nano pollution ,which is generatic name of waste generated by Nano devices or during the Nano materials manufacturing process. The scientist and profession peoples who are working on this field is concerning into two areas, First is free form nanoparticles which is released into the air or water during production or second in fixed form ,where they are part of manufactured, they will ultimately have to be recycled or disposed of as waste.



POSITIVE IMPACT OF NANOTECHNOLOGY ON ENVIRONMENT

Application of this technology is almost are in every field i.e. Mechanical, Civil, Electrical Electronics, computer science, food agriculture etc. Products of the technology are available in almost every field, reasons may be this technology offers potential economic, social and environment benefits. This technology offers the potential for significant environment benefits, including

- This technology is cleaner, more efficient industrial process compare to conventional.
- Have a ability to remove of greenhouse gases and other pollutions from the atmosphere
- Playing a role of remediating environmental damages
- Composites material or nanomaterial reduces the products or part made by weight of air planes.

NEGATIVE IMPACT OF NANOTECHNOLOGY ON ENVIRONMENT

- Lack of trained engineer and professional who are involved on this technology are not too much aware of environmental factors
- Balancing between this technology and environment concern should be up to the mark
- Products based on this technology have high demand causing high energy demand and also lower recovery and recycling rates
- Pollution related to this technology is very harmful

CONCLUSION

There is no doubt continuously working on this technology will benefits to our society & improve our environment in various ways. Products based of this technology have less weight ,less energy consumption and a cleaner technology, short come may be scientist ,professional should correlated this technology to the environment, in which choosing right Nano scale material is one of the key parameter for the future direction of this technology. All the professional who are working on this technology should have esthetical knowledge before the commercial use of this technology.

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