



Potential Applications of Nanotechnology

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ABSTRACT

Nanotechnology and nanomaterial enhances the utility of many fields beyond the imagination specially medicine ,cosmetics, agriculture and environment sector .With respect to environment , nanotechnology and nanomaterials plays vital role in protecting forest and related area,but on another side anti effects of nanomaterials and nanoproducts are not avoidable . Nanoscience and nanotechnology is a new ly introducing area which spreads over in each and every field of science and technology .It plays vital role major role in the field of researches with new processes new ideas new effective methods of synthesis and production and replacing old one without fail. The emergence of nanotechnology is beneficial to scientist ,researchers, industrialists because of characteristics like cost effective, less energy consumption, highly precise properties and increased performance of equipments and instruments . Nanomaterials are also beneficial to environment and for which whole world is concerning over its rapid deterioration. Nanotechnology and nanomaterials are promising area to curb the energy crisis and environmental related pollutions providing permanent solutions .This informative paper gives idea about the unavoidable relation of nanotechnology environment As nanomaterials have different properties because of its nanosize ,it affects the nature drastically by introducing nanoparticles in the environment causes nanotoxicity. Now it is the great requirement not only to find out hazardous nanoparticles present in environment and its impacts on nature but also to search a solutions to reduce toxicity. It is the urgent need of present situation to protect environment as well as human being specially the persons who are directly or indirectly linked with the nanoproducts including researchers ,scientist working in this domain. With short introduction of what is nanotechnology,its present and future application in various sector has been discussed.

Keywords: Nanomaterials, nanoproducts, environment , toxicity

I. INTRODUCTION

Nanotechnology is the field which is growing up fastly because of its application . Nanomaterial is the material which has the particle size ranges from 1nm to 100nm. This is the size which make it different with different properties and its application spread almost over area likewise electronics ,medicine , paints ,biotechnology etc.Large surface area an quantum properties actually produces the useful effects on the nanomaterials which decreases the waste material,energy saver, reduces cost effect. These are the factors essentials for the development of industries . Medicinal related nanoinstruments are widely been used to diagnose the rare and complicated ailments and pharmaceutical sector provides advanced medicine to cure diseases.

Agriculture, food sector and biotechnology are most advantageous sector of nanotechnology including nanopesticides,nanonutrients ,nanopackaging etc. To save and protect the environment , nanodevices and nanogadgets are too beneficial like monitoring and also to curtail the pollution. Modern waste water treatment plant uses nanoresins , nanochemicals in the purifying process .Soil quality is greatly improved with the help of nanomaterials. While concentrating on the benefits of nanomaterials and nanotechnology the adverse effect should also be measurable

II. NANOMATERIALS AND ENVIRONMENT

Nanotechnology is now a highly result oriented area in the applied technology with preparation of nanomaterial

its characterization and applications have been measured at nanosize level. Nanoscience and nanotechnology has been applied in almost each and every class of science wise physics, chemistry, biology, biochemistry, environmental chemistry. Due to nanosize the properties of material change drastically with novel changes in surface area. Nanomaterials are already present in environment. In soil & water they were colloids whereas in air as ultra fine particles ranges from different sizes. Nanotechnology plays key role in environmental sector as a contaminant remover as well as for ecofriendly industrial productivities and products. Nanomaterials like silver nanometal, TiO_2 , ZnO nano metal oxides are in used in a water and soil purification process. While considering the utility of nanotechnology specially related to environment, nanomaterial gives potential advantages e.g. use of zerovalent nanoiron for the removing contamination from groundwater and use of nanosilver to remove health hazardous microorganism from contaminated water. Another environmental sector which is horribly in danger is air. Air pollution is still highly concerning and challenging problem for scientist, researchers, government authorities though nanotechnology has provided some solutions like nano filters, nanotubes, nanofibers, nanosensors

Nanotechnology and energy crisis:

Nanotechnology plays immense role to produce nanomaterial which will provide permanent solution to energy crisis. Nano energy materials which will be a promising sources to refine fossil fuels which are on the verge of exhaustion. The excessive use of fuels not only creating scarcity but also producing serious environmental disturbance. At present fuel cells are the alternating energy storage device with high efficiency. Also solar cells are playing leading role with help of emerging nanomaterials. fuel cell catalyst, hydrogen base energy storage, lithium batteries also plays a key role to produce and provide clean energy.

Nanotechnology And Agriculture:

Nanotechnology is used in agriculture and food technology in various ways. Nanosensors are used profoundly to vigilance and monitoring crop growth and pest control. These new advanced nanogadgets are helpful to incline crop production. Nanomicro nutrients are beneficial to improve crop and food quality but also for food safety. Nanomaterials are also to keep food as it is without affecting its originality. A smart nanodevices

can be used like nanofilters with the pores are of nanoscale. Food packaging and storage is also a important part of food processing. The main purpose of packaging is to keep the food material fresh for long duration. The proper ratio of internal gases composition is the main criteria for food packaging. Nanofood packaging can produce a healthy and clean atmosphere with controlled gas exchange to enhance the durability of food. Nanocoating are also used in packaging materials. Nanoadditives are used in regular diet, health industry and food containing minerals with nanoprocessing such as potassium, magnesium, calcium etc.

III. CONCLUSION

Nanotechnology gives assurance of ecofriendly products with various options in the medicine, agriculture, green energy and many others sector. Many of them are low cost and with more utility rather than present available materials. In agri-sector food processing, food packaging, food preservation, food additives are of greatly beneficial area where nanoworks.

Nanotechnology also helpful for environment protection by removing contaminants from soil and water bodies. Moreover, Nanotechnology offers solution for a major issue of energy crisis. Nanotechnology provides nanomaterial for solar energy, green energy and fuel cell. And no doubt in the coming era, nanotechnology and its application will be dominant all over the human life.

IV. REFERENCES

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