Green nanotechnology and its goal

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ABSTRACT

Nanotechnology revolutionize all sorts of sciences includes industry which includes electronics medicine and consumer products. It involves in controlling the all the dimensions of understanding manipulation and control .o encompasses science, engineering and technology and also involves manipulating, imaging, measuring and modeling at nanoscale. Enhancement of sustainability by green nanotechnology producing extremities.

KEY WORDS: Nanotechnology, solar cells, Green nanotechnology

1. INTRODUCTION

Nanotechnology is the art of an engineering and science down to this hard to fathom scale. This technology operates at the nanoscale, about one billionth of a meter.

Famous physicist Richard Feynman suggested the idea in the year 1959 and he manipulate individual atoms and use them to build tiny machines. The term "nanotechnology" was not coined until the 1980s and with different and varied ideas. The new possibilities are open up because it works at extreme and unexplored scale. Nanotechnology makes machines out of large, complex molecules. All these different technologies are united and they use nano-sized building blocks. While others make machines out of bulk materials – microchips out of silicon, wires out of copper, cars out of steel.

As per the environmental concern nanotech catalytic converters and water filters helps to remove pollutants in fumes from exhaust and waste water treatment. This technology providing fresh solutions weather it is applied or basic nature. It may mentioned that nonmaterial is more efficient in wind turbines and solar panels around the world. Coming to the other aspect of these particles which are anthropogenic sources occurred since ancient time's helps in the development of industry in various aspects contribute significant levels of Nanoparticles pollution have arisen in most major cities extending larger cities in the earth planet.[1]

Green technology is environmental friendly and has been described as development of clean technology to reduce maximum potential environmental and human health risks concern with manufacture and use of products related to nano. Replacement of existing products with new nano that are more efficient human friendly throughout their life cycle.

Green technology has two goals: Materials produced from nano are without harming the environment or health of humans and also providing solutions to problems in the environment. Green nanotechnology uses existing principles of green chemistry and green engineering to make nano products without toxic ingredients.[2]

Making nonmaterial and products with less effect to the environment, green nanotechnology also means using nano to make current manufacturing processes for non-nano materials and products more environmental friendly. Nanoscale membranes can help separate desired chemical reaction products from waste materials. Nanoscale catalysis can make chemical reactions more efficient and less wasteful. Sensors at nano can form a part of process control system. Alternative energy systems, made possible by nanotechnology, is another way to "green" manufacturing processes.[3]

The second goal of green nano involves the developing products that benefit the environment directly or indirectly. Nonmaterial directly can clean hazardous sites, desalinate water, treat pollutants, or monitor environmental pollutants. The lightweight nano materials for automobiles and other means of transportation could save fuel and reduce materials: nano enabled fuel cells and light emitting diodes could reduce pollution from energy generation and help conserve fossil fuels: self-cleaning Nanoscale surface coatings could reduce or eliminate many cleaning chemicals used in regular maintenance routines; and enhanced battery life could lead to less material use and less waste. Green Nano takes a broad systems view of nonmaterial and products, ensuring that unforeseen consequences are minimized and their impacts are anticipated throughout their full life cycle.[4]

Applications:

Solar cells: Research is going on to use nonmaterial for purposes including more efficient solar cells, practical fuel cells, and environmental friendly batteries. The most nanotech projects related to energy are: storage, conversion, manufacturing improvements by reducing materials and process rates, energy saving, and enhanced renewable energy sources. Solar cells are more efficient as they get tinier and solar energy is a renewable resource. The price per watt of solar energy is reduced sufficiently.[5]

Nanoremediation and water treatment: Nanotechnology offers nonmaterial for the treatment of surface water, ground water, waste water, and other environmental materials polluted by toxic metal ions, organic and inorganic solutes, and microorganisms. Due to their unique activity, some potential applications include:

- To maintain public health, pathogens in water need to be identify easil, rapidly and reliably. The traditional laboratory culture tests take days to complete. Faster methods by using enzymes, immunological or genetic tests are under development.
- Nano fibers and nano biocides are used in water filtration may be improved in larger way which appear promisingly effective.
- Work is in progress to develop enzyme treatments that may be able to break down such bio films which involves more man power and chemicals and difficulty to treat microbes which involves mechanical nature.

Environmental remediation: Nanoremediation is the use of naoparticles for environmental remediation. Nanoremediation has been most widely used for groundwater treatment, with additional extensive research in waste water treatment. Nanoremediation has also been tested for soil and sediment cleanup. Even more preliminary research is exploring the use of nanoparticles to remove toxic materials from gases.[6]

Water filtration: Nanofiltration is a relatively recent membrane filtration process used in water such as surface water and fresh groundwater, with the purpose of softening and removal of disinfection by-product precursors such as natural organic matter and synthetic organic matter. Some water-treatment plants incorporating nanotechnology are made available in the market, with more in efficient. Low-cost nano separation membranes methods have been shown to be effective in potable water conversion.

Potential harmful effects of nanoparticles? Nanoparticles which have the same dimensions as some biological molecules and also interact with these. In living organisms, they may easily move inside the body, reach the blood and organs such as the liver or the heart, and may also cross cell membranes. Insoluble nanoparticles are a greater health concern because they can persist in the body for long periods of time.

Inhaled nano materials can deposit in the lungs and then move to other organs like brain, the liver, and the spleen, and p ossibly the foetes in pregnant women. Some could become toxic if they are inhaled in the form of nano. Inhaled nanoparticles may cause lung inflamation and heart problems.

Nanoparticles used in drug carriers is to deliver the drug to the target cells, to reduce the effects of the drug itself on other organs. However, it is difficult to distinguish the toxicity of the drug from that of the nanoparticle. With the exception of airborne particles reaching the lungs, has less information on their behavior in the body is still minimal. Assessment of the health implications of nanoparticles should take into account the fact that age, respiratory tract problems, and the presence of other pollutants can modify some of the health effects. Information on the effects of nanoparticles on the environment is very minimal. However, it is likely that many conclusions drawn from human studies can be extrapolated to other species, but further research is needed.

2. CONCLUSION

The goal towards is not always a positive and negative aspects are to be tackled in such a way for effective use of green nanotechnology materials. The barriers are more challenging. Hindrance to the Development and Commercialization of Green Nanotechnology

a. There are no elaborate design guidelines for researchers in initial discovery phases of green nano.

b. Many green nanomaterials require new commercial production techniques, which increases the need for basic research, engineering research, and coordination of the two between the industrial and research communities;

c. The lack of an “in depth” of scientists and engineers with experience to develop Green nanotechnology;

d. Toxicology and analysis protocols need to be developed and constantly updated to advances in the science;

e. Regulatory uncertainty persists, and green nanotechnologies often face higher regulatory barriers than existing or conventional chemicals;

f. The market demand is unclear in this aspect, especially since there are only a Limited number of commercial grade products that can be compared to conventional materials.

Although the existing methods are appropriate to assess many of the hazards associated with the products and processes involving nanoparticles, they may not be sufficient to meet lapses. The existing methods used for environmental exposure assessment are not appropriate. Therefore, the current risk assessment procedures need to be modified for nano materials.

Existing methodologies need to be modified or new ones developed to be able to determine the physical and chemical properties of nano materials, measure exposure to them, assess their potential hazard, and detect their movement inside living systems, be it in human tissues or in the environment. In general, and in spite of a rapidly increasing number of scientific publications dealing with nano and nanotechnology, there is insufficient knowledge and data concerning the nanoparticles, their detection and their behavior in living systems.

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