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Nanotechnology impact on Environment

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Abstract:

The world faces important environmental problems such as improving air, soil and water quality. Nanotechnology increases the power of many materials and devices and increases the efficiency of monitoring devices, environmental remediation, and renewable energyproduction. These products are used directly in the environment or enter the environment indirectly. Therefore, it is important for research to examine the use of this new technology for health, environment and security purposes and the environment and health.

This review examines the current state of environmental risk assessment for nanotechnology. In this research article, nanotechnology is explained in general, its advantages and disadvantages are discussed, and its risks are analyzed in line with the recommendations.Choosing the right, nontoxic materials will have a huge impact on the environment. It can prove to be highly advantageous in terms of educating and safeguarding students, as well as assisting and guiding scientists, engineers, policymakers and regulators involved in the respective domain.

Every coin has two sides, and what matters is the side we choose to bring us luck in winning. There is no denying the fact that nanotechnology is playing a role in making the earth greener, so there is no need to focus extensively on the negative aspects.

This research paper is based on the available literature like secondary and tertiary resources.

Introduction:

Nanotechnology, also shortened to nanotech, is the use of matter on an atomic, molecular,and supramolecular scale for industrial purposes.A more generalized description ofnanotechnology was s ubsequently established by the National NanotechnologyInitiative(NNI, 2010), which defined nanote chnology as the manipulation of matter with atleast one dimension sized from 1 to 100 nanometers (n m), where unique phenomena enablenovel applications." In the United States, federal funding for nan otechnology researchshowed an increase from approximately $464 million in 2001 to nearly $1. The fiscal year of 2011 saw a total of 8Billion.In addition to the government funding, private research

industries have invested an equal or greater amount in the same field.

According to an independent research and advisory firm (Lux Research), which offersstrategic advice on emerging technologies, the estimated budget of nanotechnology related manufactured products will be worth more than $2.5 trillion by the year 2015. Furthermore, it is predicted that by 2014, abou t 16% of manufactured products in healthcare and life sciences and about 50% of electronics and info rmation technology applications will includenanomaterials. The engineering of functional systems at the molecular level is known as nanotechnology.

This includescurrent operations as well as highlevel concepts. In its original sense, nanotechn ology refersto the ability to create products from scratch using modern technology and tools to create functional products.

Research Literature:

Broad Consensus Forum participants have been very successful in the following areas since 2000.

While acknowledging the feasibility and importance of the relationship between nanoscience, engineering and technology use, here are those for and against overestimations. Advances in basic sci ence and physical development have resulted from the shared definition and visionof Nano1 in 1999. Nanotechnology is considered the evolution of science and technology compared to theintroduction o f electricity, biotechnology and digital information transfer. Between 2001 and 2008, the number of d iscoveries, inventions, nanotechnology workers, R&D grants andbusinesses increased by an average of 25% annually. The global market for nanotechnologyproducts in 2009 was approximately US$254 billion.

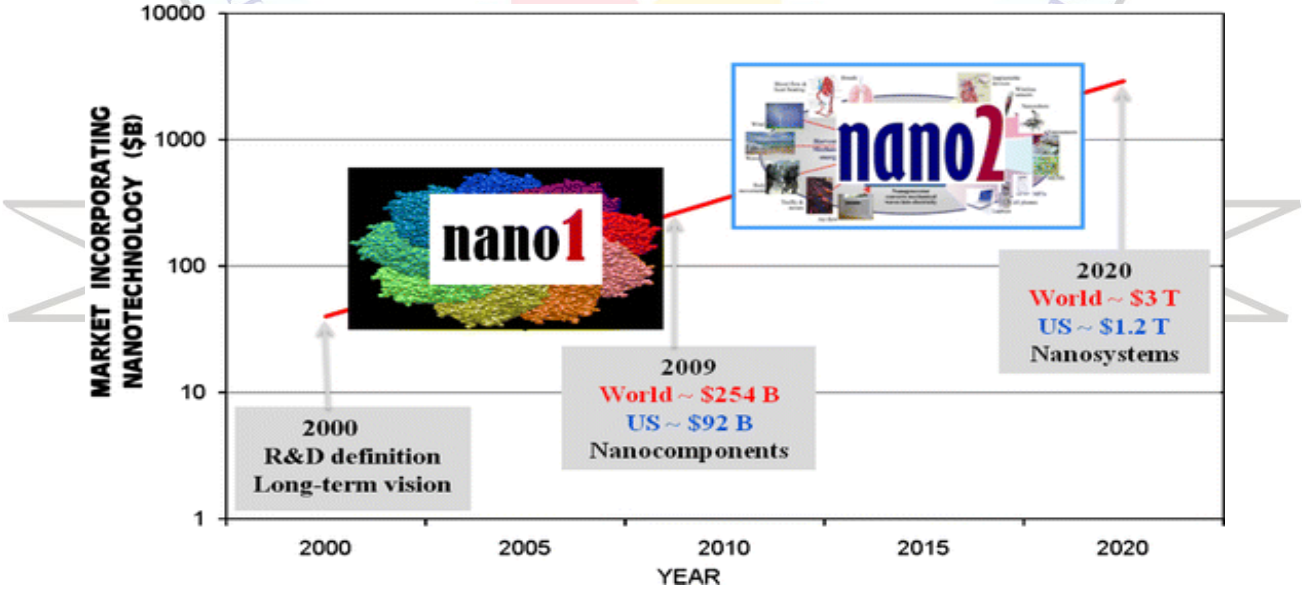

Figure 1

Nanotechnology end products: Long-term vision 2000-

2020 (robust), compared to 2009 results. The R&D focus has evolved from major discoveries in 2000 -2010 (Nano1 in Figure 1) to the use of scientific and research nanosystems (Nano2) in 2010-2020. The following article explores the advances in nanotechnology since 2000, the achievements of the la st decade, and the global opportunities in research, education, innovation and socialissues for 2020.

Stages of Nanotechnology

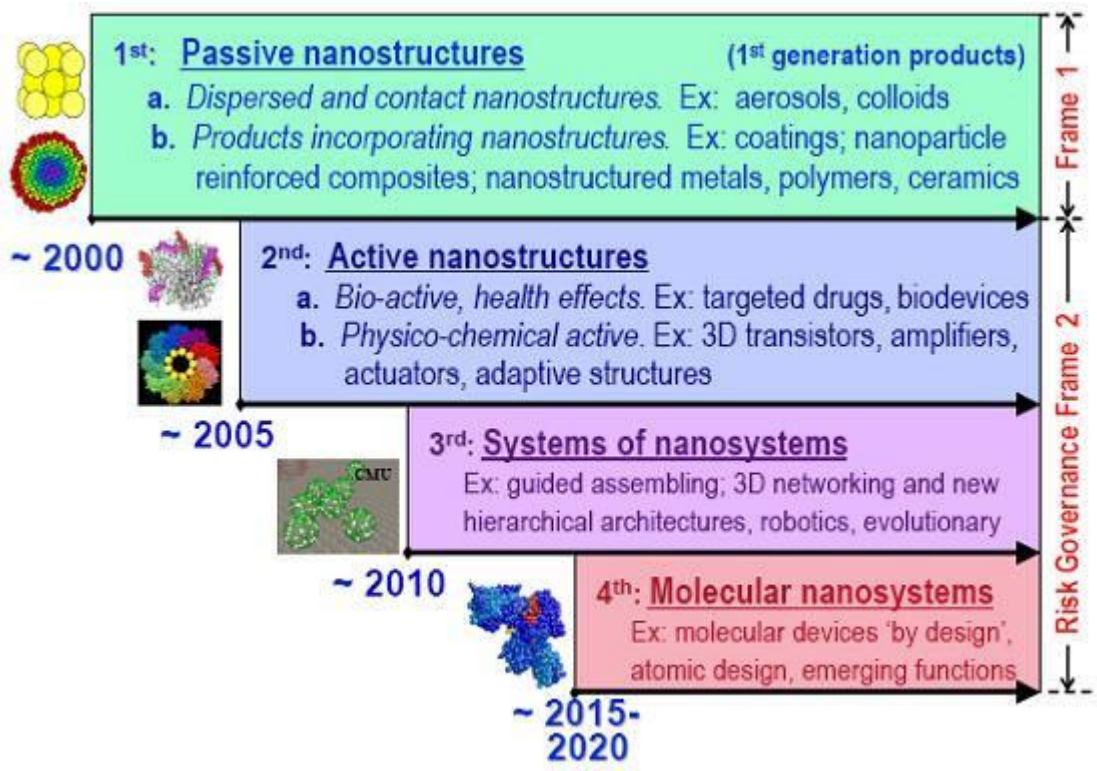

Figure 2

Nanotechnology describes the development of four generations of nanotechnology. Thecurrent term relates to passive nanostructures, i.e. materials with a purpose.

The second phase involves "functional nanostructures" for multitasking, which includes the d evelopment of efficient materials, electronic devices, and drug delivery devices. The third generationi ncludes "signature Nano systems" with thousands of interactions.

Current status of nanotechnology:

The first experiments in nanotechnology were carried out by transforming tens and hundreds of atoms into new structures. This has reached millions of atoms and is on its way to billions and trilli ons of atoms. Mr. Drexler compared this to the early stages of semi conductor manufacturing, where single transistors were made. Thanks to advances in lithography andmanufactu ring techniques, it is now possible to incorporate millions of transistors into asingle device. It seems a s if entire computer libraries have been shrunk to fit into finger-sized geometry.

Today, the greatest progress has been made in the field of DNA manipulation. As scientistsun derstood the complexity of DNA, they were able to create unique properties of the materia. This has

practical applications in creating organic storage cells with much larger storagecapacity than existing silicon solutions.

The parallelism between the semiconductor industry and the development of nanotechnology is very important. Now, in the computer world, we can see plate manufacturers and devicesparallel to them. Nanotechnology factories are not information, bytes and numbers, but atoms, molecules, prote in chains and structures. Atomic precision manufacturing brings physicalobjects to the same level of abstraction as digital content creation.

At the macro level, 3D printing is the leading commercial form of nanotechnology. Byplacing a material such as plastic at one end of the machine, a body can be created that willheat the material and maintain its position by providing very little electricity. The size of thefinal product is also not li mited to what one machine can produce, as other machines can be assembled by one person.

Environmental Problems:

Advantages of Nanotechnology-

Nanotechnology has the potential to have a huge impact on the environment. It can help usim prove the environment by saving raw materials to reduce greenhouse gas emissions. Itbasically helps us to do the following:

❖ Water Quality

We have all read the news about oil spill causing sea, ocean and ocean. Nanotechnology-based solutions can help protect ocean water in many ways:

● It can create a new generation of nanomembranes that separate water pollutants byeliminating and r educing them.

● Nanotechnology-based solutions can eliminate electronic devices.

● Advances in nanotechnology can help expand water resources by developing advancedpurification methods that overcome significant problems with current purificationtechnologies.

● Nanotechnology uses metal nanoparticles to remove organic solvents from groundwaterand helps p urify water.

❖ The weather is nice

● The world is warming up and glaciers are melting due to heat and carbon dioxide. It is thebiggest th reat to the environment and people. Therefore, it leads to an increase in greenhouse gases and, as a re sult, serious climate change.

● The process of separating carbon dioxide from carbon dioxide is very expensive anduncompetitive for largescale use. But nanomaterials can perform the same function at a good cost, even without then eed for additional components.

● Various nanoparticles are being developed to reduce carbon monoxide emissions. Addingnanoparti

cles to fuel can increase fuel efficiency and reduce the amount of greenhouse gases produced by fossi l fuel users.

❖ Recycled batteries

● Batteries contain heavy metals such as mercury, lead, nickel and cadmium, which canpollute the en vironment and threaten human health. However, with the help ofnanotechnology, the use of cathode materials inlithiumion batteries makes it possible to recycle the batteries and turn them into new ones

Effects of Nanotechnology on the Environmen-

Nanomaterials may also have negative effects. There is potential to inadvertently create newto xicity products. Although there is not much information about the environmental hazards of nanomat erials.

❖ Health risks

● Scientists have discovered for the first time the process by which nanoparticles damage the lungs a nd found that this process can be interrupted by blocking the relevant processes, a step towards addre ssing growing safety concerns.

One-Step Nanotechnology:

The future of nanotechnology is different from incremental nanotechnology, evolutionarynan otechnology and radical nanotechnology. For example, incremental nanotechnology, as an applicatio n represents the development of existing materials from the nanoscale, has led tothe development of good coatings. Emerging nanotechnology involves many complex tasks,such as sensing and analyzin g the environment through nanostructures and the role ofnanotechnology in signal processing, medici ne, and energy conversion.

Applications include chemical delivery and development of products such as transistors,solar cells, lightemitting diodes and diode lasers. This technology, called evolutionary computing, promise s major advances in computing, enabling faster processing, smaller models and more storage space. The main idea in mass production is the printer itself. To go one step further, each machinecan create a small, efficient version of itself. Think about the huge industries required toproduce cars today and consider the raw materials such as steel, glass and rubber supplied to car manufacturers. Consider boiling it down to its most basic components. As the size of the machine decreases, the operating speed increases. This is because smaller machines havemore room to move and all internal componen ts have to be moved farther away. Generallyspeaking, shrinking the machine by a factor of 10 leads t o a 10

fold increase in overall production speed; raising it to the level of nanotechnology, making a machine a million times smaller, making it run a million times faster.

Production costs ultimately depend on the cost of raw materials and the power plants required to run the nanotechnology. A laptop will cost less than $1, and a car will cost less than $100.

Conclusion:

The term "nanotechnology" covers a wide range of existing technologies. created.Considering how much public and private resources are investing in this technology, there is goodreason to believ e that new technologies developed at the nanoscale will go on a tour manytimes over the next decade. Although many of these technologies lead to environmentalimprovements, methods for assessing the risks of nanotechnology are still far from newmaterials and methods. We encourage environmental s cientists, regulators and environmental organizations to monitor this situation and help develop new r esponses to the risk.

Nowadays, nanotechnology has become a reality and it is necessary to discuss the progress of technology and its impact on the environment. It is clear that environmental concerns areincreasing. Nanotechnology can bring positive and significant changes to air quality, waterquality and sustainabl e energy production. It can help us improve and protect theenvironment.

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