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Usage of Nano Technology in the Field of Science

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Abstract – Nanotechnology is a modern, technological innovation. Much study is currently under way to take more and more use of this technology. It has a lot of potential reach. Nano-particles are tiny in dimension. Nanotechnology incorporates the understanding of physics, chemistry and biology, which therefore becomes the most strong technology that can deliver a variety of facilities that render it more convenient for the living human. Nano-particles are initially defined and chemically analyzed so as to analyze the threats posed by nanotechnology. It is found that the chemical properties of substances must be known for the intent of studying the ill effects and hazards. In the current paper, the application of nano technology in electronic networks is stressed.

Key Words: Nano technology, Size, Particle

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INTRODUCTION

There are several chemical properties that can be related to as characterizing the products and some of these properties include boiling point, melting point, molecular weight and composition etc. Information of a product's efficiency and quality may be calculated with the aid of its composition and produce.

Chemically, the detection and characterisation of nano particles should also be quite relevant. However, owing to the fact that the nano particles have a lot of variety and variability, the process of defining and characterizing nano particles is considered to be challenging. It is also observed that for the purpose of characterizing the nano-particles for risk evaluation a range of properties are expected to be studied.

The chemical properties such as particle size, molecular weight, and composition are known as very important for nano materials. Similarly, in nano materials the electrical properties such as surface characteristics, conductivity and dispersion etc. play a significant role.

There may be a variety of different processes to create a specific nano material which may result in several of the derivatives of a single material being produced. One illustration is the nano-tube that can be generated utilizing a variety of various methods and can generate goods with dissimilar chemical and physical properties.

There are several tools available to classify nano materials but these tools could be inadequate to analyze their hazards and dangers. While it is noted that properties such as boiling point are not appropriate for the characterization of nano materials mission.

It is also known that nano-materials' chemical properties appear to differ at nano size. Nano substance reactivities are observed to be higher than those of bulk artifacts since the amount of surface atoms in the former is estimated to be lower than in the latter.

There are several points relating to chemical properties which are described below:

1) The cause for the difference in nano-scale behavior of the nano-materials is the prevalence of the atmosphere. Because a variety of surface atoms are contained in nano particles, it is therefore very difficult to evaluate the electrical transfer with the assistance of a bulk method.

2) Because the amount of surface atoms in nano-materials is greater than in stars, average energy is also considered to be greater in the former. For eg, catalytic materials have greater reactivity since catalyst size appears to decrease at nano scale.

3) The composition and function of the surface chemical bonding plays a crucial role in deciding the degree of interactions between the particles.

4) The surface properties may be modified or regulated by means of molecular layers which can be used to interfere with nano particle interactions.

It is found that the form of motion of electrons may be helpful in evaluating a material's chemical properties. Ses chemical properties may provide potential for zetas and catalytic photographic products.

Compared to other nano systems, metallic nano particles are considered to be more stable, since they have limited influence over their size and composition.

Therefore, because the nano particles of gold and silver appear to bio-conjugate; they have the great variety of nano-biotechnology as opposed to other metallic nano-structures.

Metal surface resonance wavelength is dependent on the structural and di-electric properties of nano-particles. The use of nano-particles of this type is used in cancer therapies, cell tagging, bio-molecules identification etc.

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It is also known that gold nano particles are often used biologically in seed germination because of their inertion properties. They are often used in the expression of micro-RNAs and is used to monitor different processes in plants since the cytotoxicity amount is contained even higher in gold nano particles than in silver nano particles.

Therefore, because the size of metal oxide nano particles is small, they appear to exhibit distinctive chemical properties. Particulate sizes play a key role in influencing a material's different categories. The oxide's electronic properties such as lattice symmetry and scale fell under the structural characteristics and these structural and electronic properties appear to contribute to nano-particulate chemical properties.

In plant production there are multiple uses of the metal oxide particles. For eg, with the aid of silicon dioxide, the percentage germination can be improved bearing in mind that the oxide must be nano-sized.

Similarly, plant root development may be improved with the help of nano particles from alumina. These nano particles often have certain bio-applications, since they appear to exhibit magnetic properties that link their relation to certain biological system and magnet domain.

Nano-materials play a crucial role in flexible electronics production. Only by modifying the materials' nanoscale structure can we build components with the requisite electronic properties which can be rendered versatile as well.

A new translucent conductor material-silver nanowires, which creates a sparse network over a continuous sheet, has recently been commercialised. A Cambrios-developed silver nanowire ink has been used to produce touch screen computers, such as all-in-one PCs and laptops. Since the ink is naturally fluid, products with flat or rotating displays are now in the process, unlike ceramic indium tin oxide.

Future graphene is expected to become a key element in lightweight electronics as the processing technology progresses. Other products would fail to equal their excellent electrical conductivity, durability and physical strength combined.

Research into using graphene to produce several of the components used for flexible electronic devices is now well advanced. Graphene may even work extraordinarily well in battery electrodes, conducting interconnections, and also individual transistors, as well as transparent conducers. Seeing the graphene tale unfold would be interesting as the industrial processing developments develop, and manufactures continue to use the wonder material in their goods.

Flexibility is a significant development in the electronics field , allowing for a new model in design and connectivity for the gadgets on which our daily lives rely. Flexible technologies have now started to find their way into the consumer domain, and this new layer that is now open to electronics makers is expected to bring in major improvements in the next few years.

After more than 20 years of fundamental nano-science research and more than 15 years of focused R&D under the NNI, nanotechnology technologies deliver on the pledge of nanotechnology to support society in both planned and unforeseen ways.

Nanotechnology leads to greatly developing, thus revolutionizing, several fields of technology and industry: computer technology, national protection , health, transportation, energy, food protection and environmental science, among many others. Listed below is a summary of the fast-growing list of nanotechnology benefits and applications.

Other computer and electrical products include Portable memory chips for tablets and thumb drives; ultra-responsive hearing aids; antimicrobial / antibacterial coatings on keyboards and mobile phone enclosures; RFID / smart card / smart

packaging conductive inks for printed electronics; and versatile screens for e-book readers.

Copper salts with nanoparticles have been developed as a cleaner, quicker, and more durable solution to lead-based solder and other dangerous materials typically used to connect electronics during assembly.

DISCUSSION

Nanotechnology is seeking use in conventional energy sources and is significantly evolving renewable energy methods to better satisfy the growing demands of the world for electricity. Many scientists are looking at ways of improving safe , effective and sustainable energy supplies, along with means of minimizing energy use and growing environmental toxicity burdens:

Computers would be able to "load" nearly immediately utilizing the magnetic random access memory (MRAM). MRAM is allowed by magnetic tunnel junctions on a nanometer scale, which can save data easily and efficiently during a device shutdown or allow functionality for resume function.

Ultra-high resolution monitors and televisions are currently being marketed utilizing quantum dots to create more vivid colors and at the same time rendering them more energy effective.

Flexible, bendable, foldable, rollable and stretchable devices extend across numerous industries and are embedded into a broad spectrum of items, including wearables, medical applications, automotive applications and the Internet of Things. Flexible electronics have been built for applications in mobile and e-reader displays utilizing, for example, semiconductor nanomembranes.

For different forms of flexible electronics, other nanomaterials such as graphene and cellulosic nanomaterials are used to allow wearable and "tattoo" sensors, photovoltaics that can be sewn onto clothes, and electronic paper that can be roll-uped. Making highly effective, smooth, compact , lightweight, non-breakable electronics opens the door to endless smart goods.

Nanotechnology by improving catalysis increases the performance of fuel output from raw petroleum materials. It is also allowing decreased fuel usage in cars and power plants through combustion with higher performance and reduced friction.

Nanotechnology is often applicable to exploration of oil and gas by, for example, the use of nanotechnology-enabled gas lift valves in offshore operations or the use of nanoparticles to identify microscopic downwell oil pipeline fractures.

Researchers are studying "scrubbers" with carbon nanotube and membranes to isolate carbon emissions from the waste with power plants.

CONCLUSION

Nanotechnology has significantly led to substantial developments in computers and electronics, resulting in quicker, simpler, and more compact devices that can handle and retain greater and greater volumes of data. These applications which continue to develop include:

Via nanotechnology, transistors, the basic switches which make all modern computing, have become fewer and fewer. A standard transistor at the turn of the century was in the range of 130 to 250 nanometers. In 2014 Intel developed a 14 nanometer transistor, then in 2015 IBM produced the first seven nanometer transistor, and finally in 2016 Lawrence Berkeley National Lab revealed a one nanometer transistor! Smaller, quicker, and stronger transistors could mean that the whole memory of your machine could be placed on a single, tiny chip soon.

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