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New Insights and Latest Developments in Different Disciplines of Physics through Nanotechnology

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Abstract

Recent advances in physics have been made through nanotechnology that employed the nanoparticles and provide the physical and chemical basis studies of various compounds. In this regards, various branches of physical such as atomic, molecular, nuclear, thermodynamics and photonics all also made several recent perspectives in their main areas. Many photonics based objected have been designed through advances in nanotechnology for example, nature of opto-electronics as it now becomes possible to imagine using coherent light produced on a chip to control electronic interactions on the same chip. The new technologies are focusing on the development of quantum physics has applied to the nanoscale systems in order to understand the as quantum sensing. Molecular physics associated with combinations of the nanoparticles intergraded with atoms and hybrid systems that would be helpful for the ultrasensitive sensor devices that are most efficient and no environmental hazards while some of the old and traditionally used devices and machines are poorly understood with noise pollution and no significant in their preparations. As, quantum computing is based on physical materials, the choice of material is important and semiconductor materials. The newly solar cell technology has been also folding the nanoparticles coating to the adhered materials of the solid surfaces for when surface plasmon is located in front of a solar cell. Microwave plasma-enhanced also applied for the different applications of diamond films. X-ray diffraction for thermodynamic based materials also important because of the some phenomenon happening in nature deals with heat, work and temperature, and their relation to energy.

Keywords: Nanotechnology, quantum computing, semiconductor materials, X-ray diffraction, energy.

INTRODUCTION

Physics as important branch of the natural sciences that involved the synthesis, characterization and optimization of various physical based compounds. The nature of these compounds sometime appears to uncertain but the advances in physics have been made through nanotechnology that employed the nanoparticles and provide the physical and chemical basis studies of various compounds. The physical and chemical properties of newly discovered elements can be studies in conjugation with nanotechnology. In this regards, various branches of physical such as atomic, molecular, nuclear, thermodynamics and photonics all also made several recent perspectives in their main areas [1-4]. Thermodynamics deals with the study of heat and its relation with work and energy. Thermodynamics helpful for better understating of the transmission of heat energy by means of convection, conduction, and radiation. Optics that described the physical and chemical properties id light such as infrared light, visible light, and ultraviolet. Atomic physics as most emerging field that reveled the structure of the atom, its energy states. The main goal of combinations of various nanoparticles made easy, efficient delivery in physical studies such as diffraction as significant marker give clear indication of various elemental compositions [4, 5].

Nanophotonics is the most emerging science in which physical studies can be more easy as the interaction of light with matter on a micro nanometer size scale. Many nanophotics based objected have been designed through advances in nanotechnology for example, nature of opto-electronics as it now becomes possible to imagine using coherent light produced on a

chip to control electronic interactions on the same chip. Through the use of nanotechnology, optical fibres, nano based solar cells for efficient conversion of energy and other advances included the surface plasmons, localized surface plasmons around nanoscale metal objects, and the nanoscale apertures and nanoscale sharp tips. The phenomenon of light and their interaction helpful for the discovery of the optical devices. Light interact with the nanoparticles and flow of electron happens at rate in order to maintain the optical fiber sheet and in case of solar cells, light in the form of sun falls to the solar system that comprised of nanosheets for conversion into the electrical form that can be usage for the home and industrial sectors. These advances also made in order to increase the industrial growth of electronics based objects made with nanochips that can be more efficient while traditionally used objects are costly and required expensive preparaions of industrials and low shelf life. Due to which, they have been replaced by nano based objects and increased the shelf life and many other characteristic features have been made through the use of nanotechnology [6-10].

Latest developments in various disciplines of Physics through nanotechnology

The new technologies are focusing on the development of quantum physics has applied to the nanosacle systems in order to understand the as quantum sensing. Nanotechnology is applied to computers, electrical appliances in order to introduce the quantum computers, and quantum sensors, are based on the fundamentally quantum properties. Molecular physics associated with combinations of the nanoparticles intergraded with atoms and hybrid systems that would be helpful for the ultrasensitive sensor devices that are most efficient and no environmental hazards while some of the old and traditionally used devices and machines are poorly deeded with noise pollution and no significant in their preparations [11-13].

Various theories have been explained for the quantum formulation of nanoparticles for applications in the fields of electronics. One of the examples is the S-matrix theory of quantum for mesoscopic systems that have been applied to the nonlinear, far-from-equilibrium and high-speed nanoelectronic devices. The materials characteristics retained during the formulations of newly designed materials while the flow of electrons and quality of aspirated products with contamination leads to serious mechanical issues that can be resolved through the effects of molding. They layering processing happen at the sequential manner in order to maintain the flow while nanoparticles use makes the most versatile applications and made reliable products with enhanced physical applications for the manufacturing of mechanical parts [1, 3, 6, 7].

Solid and liquids combinations in nanoparticles formulations leads to address the characteristics of fluid and thermodynamics. These particles have different applications of great industrial interests because of micrometer-sized particles settle rapidly, clog flow channels, erode pipelines. Mixing the different types of the nanoparticles into the base fluid changes the thermo physical properties of the base fluid. The fluid properties can be enhanced through nanotechnology that interned the nanoparticles in the layer to the inner surface of the fluid that can be passed through their industrial process such as melting and layering and cooing. The clean fluid can be stored in order to avoid any combination and hence larger diversity as compared to the traditionally used fluids. These materials also possess the other thermal and heat transfer properties and nanofluids can enhance the critical heat flux. The nanofluids also make more valuable by addition of surfactants and other reagents that also increased their flow properties [2, 9, 11, 12].

Interdisciplinary sciences	Physical Role	Industrial value
Nanotechnology, atomic, thermodynamics, quantum and photoincs	The nature of tcompounds sometime appears to uncertain but the advances in physics have been made through nanotechnology that employed the nanoparticles and provide the physical and chemical basis studies of various compounds.	Semiconductors, Optical fibres, localized surface plasmons around nanoscale metal objects
Different physical processes have been employed for enhanced the materials utilized in the in physics of microelectronics.	One of the example is the application of the vapor deposition, in which atomistic coating	Targeted source material is heated to a temperature where there is an appreciable vapor pressure
Some of applications of the atomic physics are found in the highly designed semiconductors	semiconductors and optoelectronics	For the industrial applications
Core shell of the nanoparticle improved such as electric and magnetic resonances	The adhered materials of the solid surfaces for when surface plasmon is located in front of a solar cell	Physical and chemical operational works. The metallic nanoparticles exhibit the high potential because of their excellent properties

Different physical processes have been employed for enhanced the materials utilized in the in physics of microelectronics. One of the examples is the application of the vapor deposition, in which atomistic coating followed from the applied solids or in the form of liquids. The ultimate atoms or molecules then move from the vacuum to the substrate for facilitation of the condensation process. Because of this, the most important factor is temperature, which is the average kinetic energy of the molecules in a substance. Modern heat pipes are able to transfer heat several hundred times faster than a solid copper rod. Through the use of nanoparticles coated to the liquid surface, heat and mechanical resisted pies can be manufactured that is more valuable. In this process, targeted source material is heated to a temperature where there is an appreciable vapor pressure [3, 4].

The application of nanoparticles to the surface materials helpful for designing of new industrials appliances that are more reliable while some of the traditionally used materials are high cost and due to the serious problems to the safely, they have been replaced with the nano coated materials. These materials can be applying or injected from the nozzle. The final product depends upon the speed the monitoring wells, piezometers. This can be helpful in controlling the photocatalytic degradation in which toxic molecules can be converted into the less toxic form in order to reduce the serous health issues. It also involves the aspirate flow of the injecting nanoparticles in up gradient wells for the cleaning of the groundwater [5-8].

Some of applications of the atomic physics are found in the highly designed semiconductors in which quantum dots applications have attracted its use for the differential processes where excitions cannot move freely, discrete atomic like states with energies. The most important phenomenon is the effect of quantum confinement for the joining of semiconductors and optoelectronics to the industrial applications. As, quantum computing is based on physical materials, the choice of material is important and semiconductor materials. The high quality materials need to be employed for the aching the industrials goals. The impurities in the materials or during proceeds lead the impure form of final product that renders the products. It ultimately larded the industrial significance. It depends upon on the size and wavelength of the quantum dots. The larger of the quantum dots allows the wavelength to emit in the larger range while on the other hand, the smaller of the quantum dots allows the wavelength to emit in the shorter range while on the other [9-12].

Core shell of the nanoparticles has been improved because of their extensive use in physical and chemical operational works. The metallic nanoparticles exhibit the high potential because of their excellent properties such as electric and magnetic resonances that allow the conducting of the ions from the inner surface in the dielectric layer. The newly solar cell technology has been also folding the nanoparticles coating to the adhered materials of the solid surfaces for when surface plasmon is located in front of a solar cell [13, 14]. For the particles that suspended in water or any liquid with a high dielectric constant, their interaction with nanoparticles can be contacted as water molecules move rapidly due to their kinetic energy while nanoparticles have different types, some of them comprised of lipids that make the inner surface of the materials too hard. It also leads the high weighed materials that decrease their valuable for the commercial and industrial purposes. The surface charges are balanced through the formation of the oppositely charged ion layer in the solution that maintains the flow of materials due to which appropriate reactions happens. Sometimes, the impurities in the solution can cause the disturbances of ions on the pulsation process, therefore, the pure materials to employ for the designated highly reissued materials with excellent thermal conductivity [15, 16].

Different applications of physics have also in the plasma based as in the microwave plasmas. The most occurring events are transferred of the energy to a charged species of mass in an oscillating electrical field where flow of electrons occurs. As plasma can be found around most forms of visible electricity, like lightning, it inside your microwave can accelerated the flow if ions and atoms. It also depends upon on the interaction as well as collisions between the ions and atoms. Higher rate of the collisions can parsed the ions with atoms that increased those reactions to be happened. Microwave plasma-enhanced also applied for the different applications of diamond films. It also lies behind the optimum level of the applied or provided microwave frequency can oscillate electrons. The high degree of ionization resulted due to large collisions among the ions and atoms. It also leads the productions of the increases the rate on copious flux of ions and or radical species that also causes the health pommels as free radicals incase the rate of reaction than the normal conditions [17-19].

Some metallic based nanoparticles have been designed through engineering operations but most of them don’t follow the Ohm's law due to some of the characteristic features such as small size. The physical mechanism behind this that low capacitance leads to storage some of the charge. Due to which, barrier of the energy changes from electric behaviors of certain metals [19]. The appraised and metallic based some parts of the capacitors make the efficient use of some piece of chip in the form of nanosheet that allows the intact combinations with other adjusted assembly. This type of behavior of nanoparticles leads to emphasize its importance for the manufacturing of electronics and metallurgical engineering. The define preparation of

cobalt ferrite nanoparticles have been made through different methods such as ceramic method by firing [5], coprecipitation [5-7], microemulsions [13]. X-Ray Diffraction is one of the most powerful method for the chemical characterization of different metals. One of the best ideal and key features of using the X-Ray Diffraction is the preparation of a minimal sample for analysis. Interpreting the resulting data is relatively straightforward. X-ray diffraction helpful for characterization of nanoparticles is crystalline although some of the various precipitation agents used to prepare cobalt ferrite nanoparticles. Each method for the preparation has its own significance due to more liability and advances through using the nanotechnology that also helpful for improving the shelf life of various metallic parts used for electronic [20-24].

Some characteristic features of the dielectric nanoparticles with role in developing the pulse chirping that is much complicated structure as compared to the ordinary particles with less significance because of the toxic chemicals release the surface that damages to the final products. It resulted the formations of the individual quantum dots that followed the patterns of the two-photon fluorescence signal. Sometimes, quantum effects to be more than the optical in designing of the nanoparticles working on the principle of the physical characteristics [25-27]. Some salts can be added to the formation atomic nanoparticles during the physical and chemical presses use as n cooling from room temperature, K1 of cubic magnetite decreases steadily, but the effects of salts can be enhanced through the chemicals that accelerate the chemical reactions happening at the normal temperature [26]. Role of physics for thermodynamic based materials also important because of the some phenomenon happening in nature deals with heat, work and temperature, and their relation to energy. The oscillating properties of some objects also included the transfer of the energy and how it is affected the nearby objects. Thermal energy is the energy that comes from heat [28-32].

CONCLUSION

Physics as one of the most branch due to which matter, energy, different objects, heat exchange, characterization for the indentation of compounds can be integrated with the help of nanotechnology. This will enables the advances in functional systems at the molecular or supramolecular scale also atoms and molecules to design a the utilization of nanoparticles in the form fine layer to the particular semiconductors or objects can be made more reliable products for improving the yield of the physical objects.

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