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RESEARCH ARTICLE

Comparison of electrical devices and nanotechnology in laboratories instruments

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ABSTRACT

Nanotechnology is the fourth generation that appeared in the world of electronics. It was preceded by the first generation that used the electronic lamp, including the television, and the second generation that used the transistor, and then the third generation of electronics that used the integrated circuits, which is a very small piece that by reducing the size of many devices, but rather raising their efficiency and enlarging their functions. The fourth generation came with the use of microprocessors, which made a huge revolution in the field of electronics by producing Personal Computers and silicon computer chips that made progress in many scientific and industrial fields. The fourth generation, on the other hand, is called "molecular manufacturing," meaning that we make the material by assembling the molecules in the vacuum whenever we want, which whenever the raw material is found or was manufactured by nanotechnology, we can make large things that may reach a plane or other life basics. The beginning was 10 years ago, and he added that he started working on nanotechnology itself nearly 10 years ago, as it is a very modern technology and is considered the technology of the age, century, and decade, and the world is still preparing research and studies on how this technology and its economic and investment dimensions. For his part, said Mia Maban, director of the Center for Nanotechnology at NASA's Ames Research Center, "There has been definite progress in this area compared to the main research that was conducted 5 or 6 years ago."

Keywords: Electrical, Nanoelectronic, Nanodevice, Advantage, Disadvantage

INTRODUCTION

Nanotechnology is a new scientific breakthrough that humanity awaits with much anticipation and great hopes for investing this technology in many important scientific and economic fields that are directly related to human life, whose life needs are complicated and increasing by virtue of the great civilizational development that included various aspects of economic, social, and knowledge life. NASA has been the pioneer in applied research, as it began to move since the early 90s to search for how to take advantage of this technology in its laboratories and explorations, as it coordinated with the University of Louisiana to carry out several studies. With the shuttle externally[1-3] to the details: #2# Great benefits for humanity At the outset, Edwin Thomas, the American professor who specializes in nanotechnology, says that nanotechnology is an enormous thing and has great benefits for humanity in societies, the economy, and others. The internet and antibiotics, and scientists need a broader and more accurate understanding of the world of this technology and the areas in which it is useful or used n through it. He adds, "Nano" is a world about which we do not know much. It lies between the level of matter in the form of an atom that is neither touched nor seen, and the level of matter in the form of a tangible and visible mass. The formation of nano cells from a substance makes them possess properties and interact in a different way than what

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a visible and tangible mass of the substance itself does.[4-7] At the nano level, the material is stronger, lighter, more water soluble, more resistant to heat, and more amenable to heat conduction. He goes on to explain: "A nano-gold cell, for example, does not have a golden color, but spectra of different colors that differ as the cell mass increases, which is what glass makers use, for example, to give it different colors without their knowledge of nanotechnology." Here, Dr. Muhammad Al-Suwaiyel, President of King Abdulaziz City for Science and Technology, confirms that this technology has emerged remarkably recently as a vital area of research, especially since new manufacturing methods have been reached and a large number of applications have been invented in this field, which made the developed countries move rapidly. Fast to take advantage of this technology, and the report, which worked between 2002 and 2006, indicates that 781 applications for patents related to nanotechnology were submitted to the US Patent Office, and from other countries that monitored a large number of inventors, South Korea (100 applications) Japan (96 applications), Taiwan (55 applications), and Germany (18 applications), and we hope that this initiative will be the cornerstone for developing and developing this technology for the benefit of the Kingdom and the national economy. #3# Diamond production from coal On the other hand, Fahad Al-Muzaini, CEO in the Middle East for the American company Geoshield, which is interested in nanotechnology products, explained that the technology means complete and precise control in the production of materials by controlling[8-10] the generation of internal molecules according to the interaction directed at those molecules positively to reach. To produce a certain substance, and this is what is known as partial manufacturing. And about how to manufacture those materials and the interaction of those molecules, Al-Muzaini indicated that manufacturing requires placing the atoms during the reaction in their right and appropriate place of diamond production.

EFFICIENCY OF NANOTECHNOLOGY[11]

We have begun to reach some conclusions. Thus, with confidence, Maban finally began talking to the media, explaining that a tight chemical probe was manufactured using carbon nanotubes, and such a device is ideal for use in NASA's missions related to space chemistry. A device has also been designed to measure waves using nanotechnology, a device whose performance is much higher than the commercial devices available while using less energy, as well as being lighter and smaller. He added that this technology will have an impact in all fields, and that "NASA" should take a long-term view of the capabilities of nanotechnology that could be effective on the moon and Mars, and plans for a period of 10–15 years. Nano-initiative Challenge Workshop Miyaban recently led the Nanotechnology Initiative's Great Challenge workshop in Palalto, California. The initiative, sponsored by NASA, brought together experts in six areas where nanotechnology is likely to play a role in space efforts. As follows: (Nano materials) or (Carbon nanotubes): They are light materials that can revolutionize the design of cars due to their strength and ability to conduct electricity and heat. (Nano Robot): It is the next stage in the miniaturization process that could lead to the manufacture of microscopic motors or robots to help study biological cells and systems,[12-15] in addition to fibers. (Micro vans). They are extremely small vehicles that can be developed for deep space research, orbital, and climate research or exploration of moving surfaces. (Nano Sensors) They are ultra-small wireless, fast and highly sensitive sensors that can be placed with electronic, chemical or optical sensors for use in scientific tasks, especially in real-time analysis and robot operations.[16-19] (Nano Health Tech): Through this field, nanotechnology can be integrated into human networks such as care devices and environmental monitoring networks. (Managing the health conditions for astronauts): Through this field, astronauts on long flights can use nanotechnology to confront climatic conditions with high radiation, manufacture medical monitoring devices and treatment equipment, and help reduce or overcome the pressures and stress arising from long space flights. This can be achieved in two ways: The first is the manufacture of nanomaterials that can be used to overcome the penetration of cosmic rays from ships. The other way is nano-sensors

to determine the radiation levels. Astonishing medical advances The year 1991 is the actual beginning of "nanotechnology," when the Japanese researcher Sumio Ijima discovered nanotubes composed only of a network of carbon atoms; They are carbon cylinders with a diameter of a few nanometers, which means obtaining a one-dimensional structure, as the ratio between their length to diameter exceeds ten thousand, which gives them unique electronic and mechanical properties and makes them superior in a wide range of applications.[20-22] Through nanoformations, it has been possible to obtain a strength that is 100 times stronger than steel, and is 6 times lighter than it in weight Nano." And the matter escalated to reaching health and medical benefits through this technology, as many universities and health and medical colleges were involved in this technology to search for the extent of benefit from it and from the atoms used. It is limited to those cells only, but some centers have started making ceramics for artificial bones of an extremely smooth and hard degree, to replace joints. #5# Treatment of cancerous tumors The scientists also found that gold at the nano level has the ability to absorb light and convert it into heat energy; this feature has been taken advantage of in the treatment of cancer and tumors by injecting the tumor with gold particles at the nano level, which are inside certain particles to enable it to enter cancer cells only without healthy cells, and then a certain amount of light is shed on the tumor, so the gold particles absorb it and turn it into heat that is Enough to kill and destroy cancer cells without harming healthy cells, and this technique is known as "elective thermal light therapy."[23-25] Cell regeneration medicine Dr. Sami Habib explained that medical applications in nanotechnology have large, many and important fields, such as pharmaceutical experiments that work on the principle of drug delivery to the concerned cell designated for treatment within the human body through nanotechnology, as well as creating and building artificial cells instead of dead cells or After these experiments, those who lost their liver due to cirrhosis can be treated with this experiment and also through nanotechnology and through stem cells, and also for those who have suffered from quadriplegia, which was known to be permanent. And judged by its owner, the precision of nanotechnology is able to restore the neurons that the patient has lost. Dr. Sami confirmed that the Nanotechnology Center is currently focusing on the field of drug delivery to the cell and the field of treatment, regeneration, and building of cells, in cooperation with the College of Medicine and the College of Pharmacy at King Abdulaziz University. On the other hand, Hisham Al-Mubarik, a specialist in medical devices and a specialist in modern techniques, describes that his knowledge revolves around the philosophy of modern technologies and their incorporation into medical devices, stressing the exacerbation of many health and environmental problems in the Arab Gulf states.[26]

THE IMPACT OF NANOTECHNOLOGY IN MEDICAL AND INDUSTRIAL DEVICES

In addition to sewage waste and various wastes, increased pollution by oil and its derivatives, water, air, food, and radioactive pollution, all these problems need to be researched and investigated in various research fields. Therefore, the hope rests after God Almighty in the General Secretariat of the Gulf Cooperation Council states, universities, institutes, and specialized research centers to start giving the green light to this technology, which needs more support and encouragement, especially in the various vital fields, military, medical, agricultural, pharmaceutical, food and biotechnology fields. Biotechnology includes bioremediation for the treatment of sewage waste, nanotechnology for bioremediation of Sewage, biofilms water treatment and environmental pollution treatment with heavy metals, in addition to the utilization of this technology in the bioremediation of oil-contaminated soils.cell c Arabic. #6# He said, "However, nanotechnology can be used in the health and medical field in cancer treatment research and the accurate search for the presence of cells that are prepared to replace all treatment methods and medical examinations available today for this, and the research published at the beginning of this year on the role of this technology in dealing with malaria, and the impact on the elasticity of red blood cells, it lays the

foundations for a leading role in understanding and treating infectious diseases, and technical studies in making bone ceramics with an extreme degree of smoothness and hardness promise much in the field of joint replacement and the development of its technology, in addition to the bone industry." While recent studies that highlight the usefulness of nanotechnology in writing the codes of genes inside DNA, in a way that facilitates and saves money for examination, indicated the possibility of using this technology to benefit even from human urine in making long-life batteries for examining diabetics, as published by the Journal of Precision[27,28] Engineering Mechanisms. Dr. Kai Bang Lee of the Nanoscience and Biochemistry Research Foundation, Singapore. In operating rooms and intensive care, Laura Lechaga, director of the National Center for Microelectronics in Spain, says that the role of this technology in making medical devices used in operating rooms and intensive care is very important in reducing hospital infections and the transmission of germs to patients.

THE EFFECT OF NANOTECHNOLOGY ON ELECTRICAL ENERGY[29-34]

There are a number of so-called renewable energy, on top of which is solar energy and energy cells. All of these issues can take their place with petroleum in generating energy with the needs of the world gradually until they can reach and replace petroleum. Dr. Muhammad Al-Suwaiyel supported him in his opinion, who confirmed that nanotechnology is an essential source for the development of industries, as new manufacturing methods have been developed and a large number of applications have been invented in this field, for example but not limited to in the field of oil. Nanotechnology is used to develop catalytic materials that resulted in materials with high quality. High capabilities in terms of activity, selectivity and longevity as a technical catalyst for converting heavy petroleum oil into gas that would help develop petroleum refining and petrochemical industries. While Dr. Sami Habib indicated that the current stage that the Kingdom is going through is a very critical stage to determine its future directions in nanotechnology.[35,36] Either we catch up and adopt a national plan during the coming years to be one of the top ten countries in the field of nanotechnology research and applications, or we miss the train, as it has a source Income for countries may exceed oil sources of income. The nanotechnology market is a promising market in the global economy with values that may reach three trillion dollars over the next 5 years, despite the severe financial crisis, but nanotechnology has not been affected by spending on it at the level of countries, as the countries budget is in the development of research In nanotechnology this year, more than 25 billion dollars, an increase of ten billions over last year.[29-31] Dr. Muhammad Al-Suwaiyel supported this, saying, "This technology, which has emerged recently, has a promising future in all fields, whether in the field of petroleum, advanced electronics or the field of solar energy, due to its enormous capabilities. For example, it is now possible through this technology to manufacture Solar cells of small size, low cost and high efficiency, and this did not exist before the emergence of this technology, which is a qualitative leap that will have a significant impact in various industries." Dr. Habib concluded his speech by reminding that the Kingdom needs to spend at least 1 billion riyals annually on developing technology research to be in the middle of the ranks of global countries, and

Figure 1: Nano-device for medical samples

Figure 2: Electronic-device for medical samples

also needs more than four thousand scientists in this field, including engineers and assistants, to be able to stand on a ground that contributes to Entering and competing in investments[32] in this technology, which are estimated at volumes exceeding three trillion dollars, as trade exchanges in this field, [Figures 1 and 2].

CONCLUSION

Likewise, if the sand atoms were positioned when the reaction was conducted, the materials used in the production of computer chips could be produced. In his speech, Al-Muzaini pointed out that the traditional method of manufacturing various chemicals is by mixing the components of the reaction together without taking into account the direction of the atoms involved in the interaction, and therefore the resulting chemical materials are a mixture of several materials, while using nanotechnology it is possible to direct the placement of the atoms involved in the reaction is directed with a specific direction, so the resulting materials will be more refined and purer. The fourth generation is in electronics.

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