RESEARCH ON THE USE OF NANOSCALE APPLICATIONS IN TEACHING THE PHYSICS OF NANOSCALE SEMICONDUCTORS

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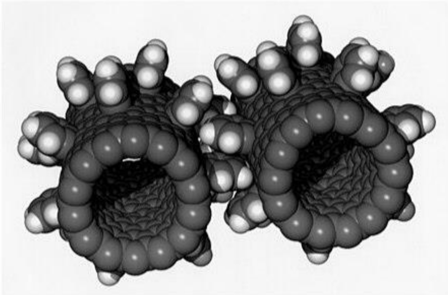
ABSTRACT

In the teaching content of the physics of nano-sized semiconductors course, nano-sized materials and their application in the field, their impact on ecology are studied. In-depth mastering of the structure and theoretical properties of nano-sized materials, To deepen the theoretical knowledge in the classroom in mastering the units, parts, materials, technologies and devices based on the achievements of MST, to increase the interest and passion of students for learning, and to encourage students to learn and master the physics of nano-sized semiconductors. to achieve good practical results in cooperation. It is possible to provide students with interesting information about nanotechnology and to increase their interest in the physics of nano-sized semiconductors. To give them interesting information about nanotechnology. Another advantage of nanotechnology is that computer equipment and mobile phones can be folded like a table cloth and carried in the side pocket. The nanoworld encompasses biology, medicine, energy, material science and other fields. We regularly read and hear about their application to various fields. however, it is known that our ideas about the nanoworld are still very narrow. In fact, nanotechnologies change the usual properties of substances and help to change the world for the better. We cannot imagine our lives without nanotechnologies in most cases. then the demand for nanorobots will increase. When the time comes, nanorobots will perform the tasks that humans can do. In this way, nanotechnology will develop rapidly.

Keywords: History of development of nanotechnology, Nanotechnology, Nano-sized materials, Application of nanotechnology in various fields, Determination of environmental risks associated with the use of nanotechnology.



Nano-shesternya

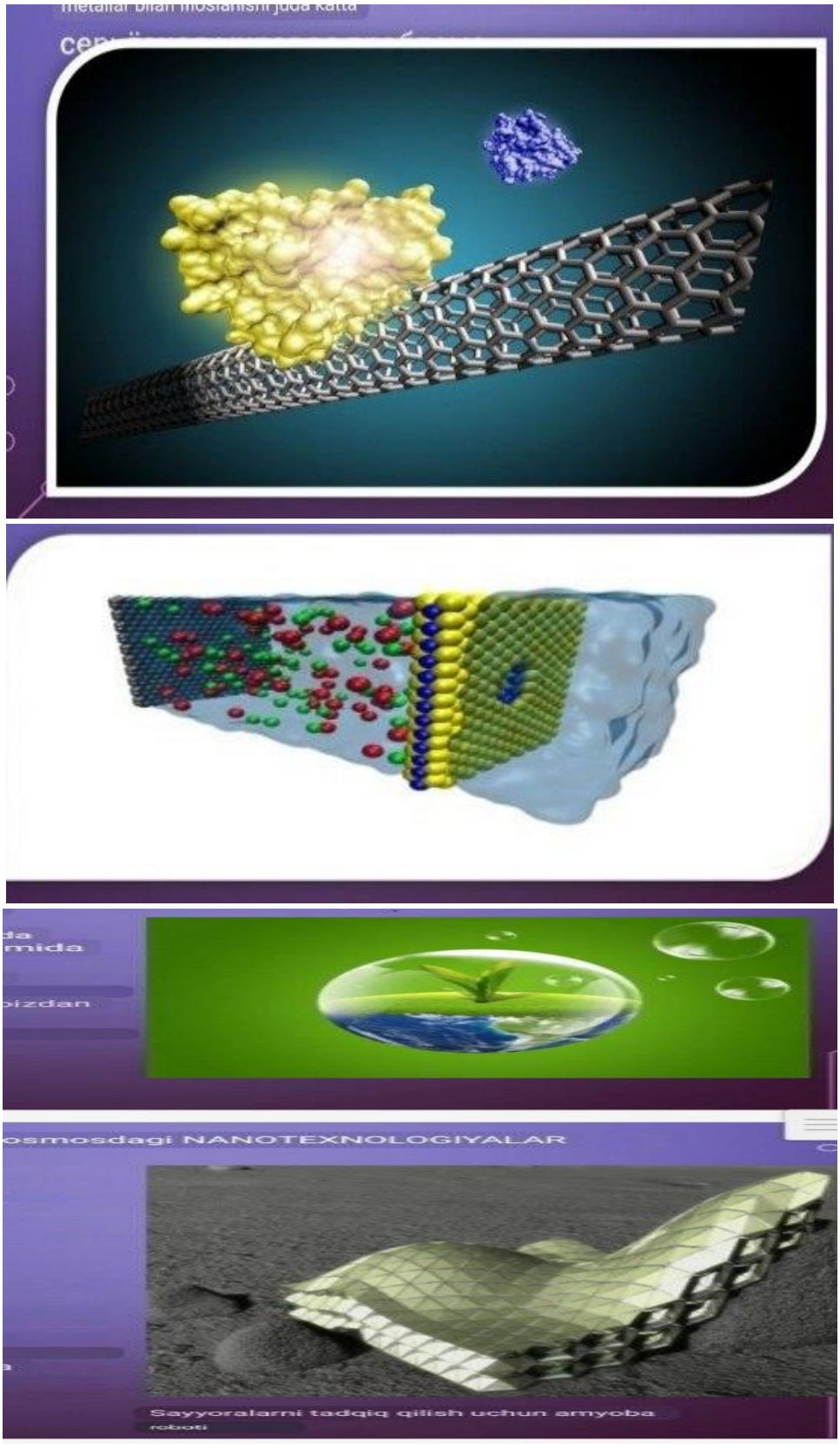
Several scientists have conducted scientific research on the history of the development of nanotechnology. The term nanotechnology was first used by the Japanese scientist Norio Taniguchi (Tokyo Science University) in his scientific lecture entitled “On the Basic Concept of Nanotechnology” at the conference of the Japanese Society for Precision Engineering in 1974. In 1974, Norio Taniguchi named the term nanotechnology as "Processing, separation, combination and deformation of materials with molecular and atomic precision." The next stage of the development of nanotechnology was caused by an invention discovered by Heinrich Rohrer and Gerd Binnig from the Zurich IBM laboratory (Switzerland). They invented the scanning tunneling microscope. As a result, they became Nobel laureates. They added. With these discoveries of scientists, nanotechnology developed rapidly and achieved great achievements.

Nanotechnology is considered a fundamental and applied science, it deals with theoretical foundation, production and use of products with atomic structure. The word “nanotechnology” is derived from the words “nano and technology” and it means something, for example, one billionth of a meter. Nanotechnology includes instrumentation, materials science, etc. aimed at creating materials. The modern application of nanotechnology Some information on its application is also given. For example, high-strength nanocrystalline and amorphous materials, polymer-based non-combustible nanocomposites, heat elements, electric accumulators, energy converting and storage devices are examples.

When we say nano-sized materials, we understand materials with dimensions equal to several hundred nanometers. We can use silicon as an example of such nano-sized materials. Many new phenomena in nanomaterials arise from the fact that the electron has a wave nature. It can be considered as a situation in an angular potential barrier. An electron wave located in such a potential barrier can return from the walls of the potential barrier and interfere with them, even due to the tunnel effect from the potential barrier. This is definitely a potential barrier. depends on the size, value of the

potential barrier energy and the relationship between the width of the potential barrier and the wavelength of the electron.

Nanotechnology has developed as a science and it is used in various fields. For example, it is used in medicine, cosmetology, biology, military field, food industry, space, ecology and other fields. There are several reasons for the use of nanotechnology in medicine. It is the diagnosis and treatment of diseases, nanocapsules containing medicine and its targeted delivery, adjustment in certain types of cells. In biology, it is possible to introduce nanoelements into a living organism at the atomic level. Nanoelements are also used to detect various diseases. Tuberculosis, HIV, especially dangerous can instantly detect infections, many poisons and anti-cancer antibodies. Nanotechnology not only creates supermicroscopic means of mass destruction, but also miniaturizes the means of their production. Experts say that the nanoparticles that can be avoided are silicon, ceramics, and polymers. Nanoparticles are also used to deliver useful substances to precisely selected parts and cells of the body. To date, more than 500 food products have been manufactured in the world using nanotechnology. more than 90 percent of the production and consumption is dairy products. If rockets change their shape depending on the mode with the help of nanotechnology, it works optimally. In addition, nanotechnology is also used to solve environmental problems. It can break down nitrogen and carbon oxides, which are harmful to humans. Nanotechnology also plays a big role in solving problems related to environmental protection. It also creates "clean" technologies that produce minimal production waste. It also includes recycling waste from landfills and cleaning polluted water bodies. In other new industries, nanorobots prevent and eliminate them when production increases. The benefits of nanotechnology it has its advantages as well as disadvantages. The disadvantage is that it has a great impact on human health and the environment. Nanomaterials, in addition to their advantages, have an environmental impact due to their chemical composition, increased reactivity, and very small size. According to scientists, nanoelements greatly reduce the breathing and sensitivity of the human body.



In short, nanotechnology is a symbol of the future. You cannot imagine the next stage of civilization. The benefits of using nanotechnology are endless. The development of nanotechnology continues today. With its help, humanity is really

solving global problems. in other words, the aspects of nanotechnology that we do not know are being opened. Scientists and governments of the whole world are using the achievements of nanotechnology for good works without going beyond the limits of prudence, and they are spending enough energy and enthusiasm.

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