

DEVELOPMENT OF NANOTECHNOLOGY IN THE WORLD AND IN UKRAINE

The article is devoted to the current state and development of scientific - technical progress in Ukraine and in the world, the basic trends and features of the impact on industries. In the article the necessity of large-scale changes that lead technological "breakthrough" in Ukraine.

Keywords: scientific - technical progress, innovation development, innovation.

The formation of a new sixth technological structure just out of the embryonic phase of a phase of growth. The process of replacing his previous technological structure accompanied in the leading countries of the world an unprecedented scale financial crisis, the transition to long-wave depression. For developing countries in these conditions opens the possibility of rapid development on the crest of a new long wave of economic growth through the timely development nanotech-gies and forming technology sets the nucleus of a new tehnohich-foot structure (nanoeletroniki, biotechnology, laser technology, nanomate-rials, etc.) and upgrading its bearing sectors (healthcare, telecommunications, agriculture, aviation, shipbuilding, instrumentation, etc.). in developed countries out of the crisis associated with the transition to a new long wave of economic growth based on the speedy formation a new technological structure and modernize the economy.

Innovative processes in Ukraine's economy, unfortunately, not yet significant extent, the number of enterprises that implement innovations decreases every year and now stands at 12-14%, which is 3-4 times less than in developed economies innovation. Knowledge-based industrial production-tion is at 0.3%, which is much less than the world level. Almost a third of the funds spent on innovation, account for the purchase of equipment, while the acquisition of rights to intellectual property or new on R & D costs much less. Almost half of the innovative enterprises generally do not fund for the benefit of its manufacturing research.

This situation is due to a lack of funds and lack actor in recent years the state system to stimulate innovation, the beginnings of which were gradually

removed annually in the last 5 years of relevant amendments to the budget and other legislation. [5]

However, the low level of knowledge intensity of domestic production is determined not only shortage of money or lack of incentives and benefits. The fundamental importance is the structure of the economy. The Ukrainian economy is dominated by low-tech industries, which naturally belong to malonaukoyemnyh sectors: mining and fuel - 0.8-1%; food, light industry, Agro-industries - 1.2%. In general, in Ukraine dominated play production 3rd technological structure (mining metallurgy, railway, large-inorganic chemistry, etc.). Accordingly, almost 95% of domestic production plants belonging to the 3rd and 4th technological structures.

The most informative assessment of innovative development of Ukraine in the context of the key factors that determine it obtained from Viko-municating indicators of the European Innovation Scoreboard, which include five groups of indicators: "the driving force of innovation", "creating new knowledge," "innovation and entrepreneurship ", " application of innovation indicators ", " intellectual property. " For EIS Ukraine is the last in terms of innovatyvnosti fourth group - "the country moving chase" with the index value of 0.23. This group consists of: Hungary - 0.24, Russia - 0.23, Ukraine - 0.23, Latvia - 0.22, Poland - 0.21, Croatia, Greece - 0,20, Bulgaria - 0.19 Romania - 0.16, Turkey - 0.08. Compared with other EU countries lag of Ukraine from "leading countries" - about 3 times (Sweden - 0.68), from "countries followers" - 2 times (United Kingdom - 0.48), the countries' moderate innovators "- 1.6 times (Norway - 0.35). [4]

Ranking countries on the basis of innovative integrated indicator-tion of a value in the sense that this index determines how economic growth is based on innovation. And innovations in terms EIS understood in a broader context than just technological innovation. In addition to research, development, technologies, these include technological diffusion indices, rates of new knowledge and the degree of information technology. [3]

Today, the process of replacing the fifth to sixth technological structure opens opportunities for Ukraine technological breakthrough. A necessary condition for this is the timely creation backlog for the development of key factors and core of a new technological structure and modernization ahead of its key industries. Today you need to master key core manufacturing new technological structure, further expansion which will receive the intellectual rent.

In order to make technological breakthrough and create innovative model of economic development in Ukraine, to be implemented:

- Active and full support of the state, special and regional authorities of newly created innovation-oriented structures and their potential creators;
- Development of alternative outflow of highly skilled professionals from Ukraine, as a high level of "brain drain" makes it impossible to build a high-tech economy;
- Create market mechanisms that make the development of science and implementation of cost-effective achievements as innovative trends can not be formed only centralized solution;
- Attracting foreign investment to stimulate the development of nadryzkovoho business venture;
- Promoting the active development and operation of small innovative businesses, mobile and more capable to rapid development and innovation in production;
- Creating conditions combination of innovative infrastructure elements and major scientific and educational centers [1].

Development, creation, research and effective use of a variety of nanostructures are impossible without a large arsenal of tools, methods and processes, supported by appropriate equipment and devices. Powerful, flexible, almost universal means of research nanostructures, manipulating atoms and molecules, the creation of these structures, allowing visualization and control of nanostructures created is scanning probe microscopy. Recently created many of microscopes based on different physical phenomena. In particular it should be noted tunneling microscopy, atomic sylovumikroskopiyyu and optical near-field microscopy.

The current state of affairs can rightly be called nanotechnology boom that covered most areas of human activity. There are new concepts: "nanoelectronics", "nanophysics", "nanotechnology", "Nanobiology", "nanomedicine".

A very important factor in the development of nanotechnology is nanopromyslovosti economy. The fact that technology is creating any product has two approaches: technology a "top-down" when we get the product from larger pieces through the offices of unnecessary parts and technology "bottom-up" when manufacturing products made of elements "lower order" (atoms, molecules, fragments of biological cells, etc.), which are arranged in order. According to this principle is the nature of the construction of complex biological systems. Current production is on a "top-down", which is very inefficient compared to natural processes as the share of useful raw materials used by weight, and cost of energy. In the final consumer product becomes ~ 1.5% by weight of raw materials extracted and the share of energy used and useful tohomenshe. Nature has much more economical. It is widely used wasteless collection and a collection of very

complex systems with simple molecules. Self-assembly and self-organization play a key role in all living things. [2]

Nanotechnology is technology on the way "bottom-up". Recent studies have shown a real opportunity to create industrial technologies of nanosystems. Experts predict that in 10 - 15 years of success of nanotechnology will create robots - Assembler to be able to generate and collect your nanosystem analogue for a given program, without direct human intervention.

The principal aim of nanotechnology is to create and use strategies similar to those that exist in nature and function, giving particular importance nanotechnology. Nanotechnology actually blurs the boundaries between artificial and natural.

Nanotechnology, Nanoscience is an interdisciplinary area and requires interdisciplinary research based on growing and mutually complementing each one science and technology, resulting in unexpected, new products and methods. Thus, nanotechnology systematically associated with many disciplines and existing technologies, and this specificity is reflected both in the study of structures and phenomena in nanometer-level, and the process of education and training in the field of nanoscience and nanotechnology.

Despite the short time of nanotechnology came close to the practical task of designing and creating devices, machines and integrated systems of nanometer size parts, components and assemblies. For the development of this new field for engineering practice activities require more fundamental grounds and approaches than traditional in the production. They should be based on the laws of quantum physics, biochemistry, molecular biology and others. So far in this direction made only the first steps. But enormous opportunities encourage scientists and engineers for the early use of almost unlimited potential embedded in nanotechnology nature, to solve a wide range of vital tasks of society. Nanotechnology opens up the possibility of fundamental change of the current state of science and technology and create prerequisites new scientific and technological revolution. [5]

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