

NANOTECHNOLOGIES OF FUTURE

Research in the field of nanotechnology has increased over the last decade. The idea of nanotechnology appeared in 1980s in studies of E. Drexler who worked at the laboratory of artificial intelligence at Massachusetts Technical Institute.

Nanotechnology is the biggest achievement of modern science associated with scientific and technological revolution of the third millennium. The term “nanotechnology” began to be used by the Americans in the 1980s. The term “nano” means tiny or billionth (10^{-9}). In 1905 the Swiss physicist Albert Einstein published a study which showed that the size of sugar molecules equals to about one nanometer ($1 \text{ nm} = 10^{-9}$). Let's imagine that a nanometer:

- It is a million times smaller than the length of the spine.
- Thickness of a sheet of paper is about 100,000 nanometers.
- The diameter of a red blood cell is 7000-8000 nanome.

Nanotechnology is widely used in nanoelectronics nanotubes. Carbon nanotubes are ideal candidates for the role of elements for electronic schemes due to the unique physical properties and structural features. Main potential of nanotubes in nanoelectronics is the ability to create submicron elements for electronic circuits – nanotransistors, nanodiodes, nanocathodes. American company Nantero introduced a new type of computer memory which also uses nanotechnologies.

In the near future, nanotechnology will become one of the driving forces of innovation in medicine and pharmacy. Growing number of publications and patents in nanotechnology has been increasing for 10 years almost 6 and 12 times, respectively. In 2004 the global turnover of nanomedicines was estimated as 6 billion dollars. Over 50% of pharmaceutical manufacturing companies working in the direction of nanomedicine use NI to develop delivery systems APIs to organs and target tissues (80% of turnover in the global nanomedicine).

Nanotechnologies have great potential. They can make our life easier, protect human being from bacteria and viruses, achieve great success in automation solving the problems that a person is not able to perform. By 2020 the global nanotechnology market will grow up to \$ 75.8 billion.

REFERENCES

1. La Monica M. IBM: Tiny carbon nanotube transistor outshines silicon / M. La Monica. – 2012. Available at: <http://www.cnet.com/news/ibm-tiny-carbon-nanotube-transistor-outshines-silicon>.