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Розглянуто нагальні проблеми економіки, інженерії, інформаційних технологій, охорони навколишнього середовища, наук про землю, гуманітарних наук.

Також приділено увагу сучасному законодавству, спрямованому на вирішення цих проблем. Матеріали згруповано у розділи, що відповідають секціям форуму і відображають сучасні тенденції та інноваційні розробки молодих учених, представників різних країн світу в різних галузях економіки.

Відповідальність за достовірність фактів, цитат, власних імен та інших відомостей несуть автори публікацій.

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Nanomaterials are the future of our planet

Our modern world is filled with many things that humanity has created for itself. The profession of materials scientist is to study the properties of materials and develop new materials. The main purpose of this profession is to acquire knowledge about the structure and properties of materials and to establish a connection between the composition of materials. All the knowledge that a material scientist acquires not only helps to explore our planet, but also helps to create new materials that help maximize the conservation of natural resources and not pollute the Earth.

Research methods: 1) Analysis of scientific works of famous scientists. 2) Research of materials science technologies used abroad. 3) Generalization of ideas of scientists and specialists who have directly studied this problem. 4) Creating a model for solving ecological problems at the present stage with the use of nanomaterials.

Steels are made on the basis of nanotechnology, practically not subject to corrosion effects. A vapor permeable glass was created using these same technologies, There are also energy-saving pellicle that are self-cleaning and used for translucent structures. In addition, the study found that the service life of buildings that were built using nanotechnology exceeds 2-5 times the service life of the strongest buildings of the late 20s early 21st century.

The "lotus effect" technology, developed in Beijing, helps to create non-pollutant materials. This is due to the high density of particles that do not allow water droplets or dirt to linger on it. Also, these materials are completely transparent.

Material scientists from Shanghai have created translucent nanoclays that have the ability to accumulate solar energy, these pellicles are applied to the windows of homes and significantly reduce energy costs.

Electric trunk cables on carbon nanotubes may appear in the near future. They will be able to conduct high voltage currents much better than copper wires, while weighing five to six times less.

Nanomaterials will reduce the cost of precious metals by 15-20 times. For example, by replacing with nanomaterials the platinum used in automotive catalytic converters, which cleanse the exhaust from harmful impurities.

Nanobots:

Robot can designing any object. Modern scientists and experts argue that such robots can appear as early as 2025. It is theoretically possible that these robots will be able to construct from ready atoms anything.

It is also theoretically possible that molecular work will be able to create food by replacing farm animals and plants. For example, create milk directly from the grass. This significantly stabilizes the environment, as new types of industry will not produce waste.

Incredible possibilities can become real, such as the colonization of other planets. Nanorobots will be able to create the habitat necessary for human life on other planets.

Aerospace Engineering:

Spare parts of which can be made can be much easier and better, made with minimal or no metal. [1]

Water purification using nanomaterials and nanotechnologies:

Nanomaterials are endowed with unique properties, such as high surface-to-volume ratio, high reactivity and sensitivity, self-assembly properties on substrates for film formation, high adsorption, and more. Due to these properties, nanomaterials are effective against various organic and inorganic pollutants, heavy metals, as well as against various harmful microorganisms present in contaminated water. [2]

Nanostructured catalysts are widely used in the treatment of industrial waste and the purification of industrial waste gas. [3]

Eco-friendly food packaging:

In the area of food packaging, an example of the use of nanotechnology is materials that come into contact with food. Nowadays, nanocomposite materials are widely used as packages or coatings, which are applied to plastic containers in order to limit gas diffusion and increase the shelf life. These packages are also used in the production of antimicrobial materials in contact with food. [4]

Material science is a leading science in the field of ecology, with which you can save the resources of the earth and the sustainability of ecology.

References:

1) Analysis of current trends in the use of nanotechnology in environmental and other fields. <http://eco.com.ua/content/analiz-suchasnikh-tendentsii-vikoristannya-nanotekhnologii-u-ekologichnii-ta-inshikh-sferakh>

2) Nanomaterials and Nanotechnologies in Water Treatment. <http://science.lpnu.ua/uk/ctas/vsi-vypusky/volume-1-number-1/nanomaterialy-ta-nanotekhnologiyi-v-ochyshchenni-vody-oglyad>

3) DI Rizhonkov, VI Levina, and E.L. Dzigiguri Nanomaterials: A Tutorial. - Moscow. Laboratory of Knowledge, 2012. - p.335

4) Utilization of nanotechnology achievements in ecology. <https://cyberleninka.ru/article/n/ispolzovanie-dostizheniy-nanotekhnologiy-v-ekologii>