[a] The epithermal region is sometimes considered to be above the cadmium cut-off energy at 0.4–0.5 eV, corresponding to the energy at which a sharp decrease in the cadmium cross-section occurs.

[b] At 20°C, the peak of the thermal neutron fluence distribution occurs at an energy of 0.0253 eV. The upper bound of the energy of thermal neutrons is sometimes given the cadmium cut-off energy.

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INFLUENCE OF HUMANITY ON NATURE

In the conditions of scientific and technological progress, the relationship between society and nature has become much more complicated. Man got the opportunity to influence the course of natural processes, conquered the forces of nature, began to master almost all available renewable and non-renewable natural resources, but at the same time pollute and destroy the environment. Human intervention in natural processes is increasing sharply and can cause a change in the regime of soil and underground water in entire regions, surface runoff, soil structure, intensification of erosion processes, activation of geochemical and chemical processes in the atmosphere, hydrosphere and lithosphere, changes in microclimate, etc.

Stages of changes in the biosphere by humanity, which culminated in environmental crises and revolutions, namely:

- the impact of humanity on the biosphere as a normal biological species;
- over-intensive hunting without ecosystem changes during the period of human development;
- changes in ecosystems as a result of processes that occur naturally: grazing, increased grass growth by burning, etc.;
- intensification of the impact on nature through soil plowing and deforestation;
- global changes of all ecological components of the biosphere as a whole.

Human influence on the biosphere can be reduced to four main forms:

- change in the structure of the earth's surface,
- a change in the composition of the biosphere, the circulation and balance of the substances that make it up,
- a change in the energy, in particular thermal, balance of individual regions of the globe and the entire planet,
- changes made to the biota as a result of the destruction of some species, the destruction of their natural habitats, the creation of new breeds of animals and varieties of plants, their relocation to new habitats, etc. [1]

According to a 2018 study in Nature, 87% of the oceans and 77% of land (excluding Antarctica) have been altered by anthropogenic activity, and 23% of the planet's landmass remains as wilderness. [2]

The concept of pollution. Classification of environmental pollution.

Environmental pollution means the entry into the biosphere of any solid, liquid, or gaseous substances or types of energy (heat, sound, radioactivity, etc.) in quantities that have a harmful effect on humans, animals, and plants, both directly and indirectly by. Directly, the objects of pollution (acceptors of polluted substances) are the main components of the ecotope (place of existence of the biotic community): - atmosphere, - water, - soil. [3]

World Environment Day, which is observed annually on June 5, is one of the main ways for the United Nations to draw the attention of the world public to environmental problems, as well as to stimulate political interest and action. Such an event as the celebration of this Day is designed to bring the human factor into the issue of environmental protection. [4]

Today it is very important for people to understand that nature is the only source of all the wealth that man needs for existence. Only a rational, thrifty and reproducible attitude towards nature can save humanity. To preserve life on Earth, man must protect nature. [5]

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DISCHARGE OF PERSONNEL IRRADIATION DEPENDING ON THE CONDITIONS OF THE LOCATION OF SOURCES OF IONIZING RADIATION

The management of stochastic effects in radiological protection relies on the concept of effective dose (E), established by the International Commission on Radiological Protection (ICRP). Effective dose, derived from equivalent doses to risk organs and tissues, serves as a fundamental parameter for implementing radiation protection principles. However, effective dose cannot be directly measured and requires estimation through dose distribution in the human body, often facilitated by conversion coefficients (CCs). These coefficients relate physical, measurable quantities to protection quantities and are essential for assessing radiation risks in various exposure scenarios.

Conversion coefficients bridge operational quantities defined by regulatory bodies like ICRP and International Commission on Radiation Units and Measurements (ICRU) with physical quantities characterizing radiation fields. Commonly employed physical quantities include kerma free-in-air (Ka), tissue-absorbed dose (DT), and particle fluence (Φ). Conversion coefficients are crucial for evaluating health risks to populations in specific exposure situations and assessing the potential benefits of relocation from high-exposure areas.

This study utilized the Alderson RANDO phantom, an anthropomorphic model widely used in radiation dosimetry experiments. The phantom's organ positions and mass fractions were meticulously determined through a combination of published data and expert consultation. Experimental setups involved exposures on open surfaces using various radionuclides to investigate energy-dependent conversion coefficients. Dosimeters, including thermoluminescent detectors (TLDs) and optically