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ATMOSPHERIC AIR POLLUTION AND MEASURES FOR ITS PROTECTION IN MACHINE-BUILDING

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Abstract: This article discusses the causes of atmospheric air pollution and its negative impact on the biosphere and human health. It also addresses the amount of industrial and transport emissions, ways to reduce them, and the importance of purification devices and monitoring systems. Environmental protection is considered an urgent ecological issue.
Keywords: Atmosphere, pollution, ecology, air protection, industrial emissions, transport, toxic gases

Currently, environmental protection and ecological issues are considered one of the biggest challenges [1]. Ecology and environmental protection are at the center of attention of the global community, with major authoritative organizations working on these matters. Recently, due to the rapid development of science, technology, manufacturing industry, and other sectors of the national economy, various harmful gases and industrial waste are being released into the atmosphere and environment. This is leading to changes in natural conditions, a decline in flora and fauna, alterations in climatic conditions, and ultimately having a negative impact on human life. These issues present a challenge to all scientific and engineering personnel, senior government officials, and law enforcement agencies, as well as humanity as a whole, to focus on environmental protection, rational use of natural resources, implementation of harmless production methods, and ensuring the proper and clean delivery of all resources to future generations [2-6].

Special attention should be paid to the study of the topic "Protection of Atmospheric Air." This is because almost all processes in the biosphere occur through the atmosphere. The atmosphere is the Earth's air envelope, the source of life in the biosphere. The atmosphere regulates heat on the Earth's surface. It serves as a protective screen against harmful cosmic radiation for all living organisms in the biosphere. There is a relatively natural balance of gases in the atmosphere, and changes to this balance lead to disruption of the ecological equilibrium. There is a particularly high risk of changes in the carbon dioxide balance due to human impact. Atmospheric pollution refers to changes in the physical and chemical properties of the air as a result of the introduction of foreign compounds into it. The atmosphere is polluted by natural and artificial means. The level of artificial pollution is very high [7].

Global, regional, and local atmospheric pollution are distinguished. Chemical, mechanical, acoustic, electromagnetic, and radioactive atmospheric pollution are observed. Among these, the most dangerous is radioactive air pollution. Air pollution exceeding established norms leads to negative consequences. Especially "alkaline factors," "smog," and "ozone holes" cause great harm to human health and all living creatures. Buildings and historical monuments also suffer from air pollution. As a result of air pollution, countries suffer significant economic losses [8].

A system of measures has been developed to prevent and reduce air pollution. To study atmospheric air pollution, a monitoring and control system is implemented. The maximum permissible concentrations (MPCs or PDKs) of air pollutants have been established. Atmospheric pollutants include carbon dioxide (CO2), carbon monoxide (CO), nitrogen oxides

(NOx), sulfur dioxide, chlorofluorocarbons, and particulate matter such as dust, soot, and smoke. It is important to note that these pollutants react in the atmosphere under the influence of water vapor and sunlight, forming new compounds.

Industrial and transport-related pollution in the atmosphere amounts to 3.0 billion tons per year worldwide. Of this, 150 million tons are attributed to the USA, 100 million tons to Russia, 4.5 million tons to the Republic of Uzbekistan, 400 thousand tons to the city of Tashkent, and 70 thousand tons to the Kibray district. Air pollution is detected using special permanent stations and mobile laboratories. Measures to prevent atmospheric pollution are diverse. To reduce air pollution, the amount of emissions (PDK) released into the atmosphere by each enterprise is regulated, and various treatment facilities are installed. The implementation of waste-free technology and the creation of environmentally friendly vehicles are measures that fundamentally address the problem of atmospheric air pollution. In Uzbekistan, air pollution is one of the significant environmental problems. Due to the location of large cities and industrial areas in foothill and mountainous regions, the level of atmospheric air pollution is considered high.

Population growth, the expansion of cultivated areas, and pollution of ocean and sea waters necessitate increasing technological efficiency. However, this has both positive and negative effects. For instance, a single car traveling 15,000 km consumes 1,500 liters of gasoline and 4,350 kg of oxygen. In 1990, the number of cars worldwide reached 450 million. By 2000, their number was expected to reach 700 million. The oxygen burned by a modern jet aircraft in 1 hour could sustain 18,000 people. If 500 jet aircraft ascend to an altitude of 17-20 km, they can reduce the ozone layer by 8-30%. If 125 rockets are launched simultaneously, the ozone layer covering the Earth's surface would be completely destroyed.

According to data, there are 142-200 billion tons of carbon monoxide in the atmosphere. When 1 liter of gasoline burns in an engine, it releases 200-400 mg of lead, and throughout the year - 1 kg. At a distance of 150 meters along the highway, 5 mg of lead accumulates in the stems of planted trees and crops, which can be harmful to human health. Globally, in 1990, the amount of gas, carbon monoxide, soot, and carbon dioxide released into the atmosphere amounted to 500 million tons. Since the emergence of humans until 1999, 85 billion tons of various fuels - coal, uranium, peat, natural gas, oil, crude oil, firewood, and others - have been burned. From these, smoke and carbon monoxide gases rose into the atmosphere. In Uzbekistan, 44.3 billion cubic meters of natural gas were produced in 1993. Thus, the atmosphere contains 140 billion tons of carbon dioxide, 10% of which is formed by the combustion of fuels. Recently, its amount in the atmosphere has been increasing year by year. When 1 ton of gasoline burns, 60 kg of carbon monoxide rises into the air. One thermal power plant burns 151,000 tons of coal monthly. As a result, 33 tons of sulfur dioxide and 250 tons of ash are released into the atmosphere daily from the plant's chimneys. One thermal power plant burns 151,000 tons of coal monthly.

Due to incomplete combustion of fuels, poor quality, and poor operation of smoke-retaining devices, various compounds from the atmosphere are gradually reaching the earth's surface. For example, 17 tons of black sand falls per square kilometer in New York City each month, and 34 tons in Tokyo.

In Uzbekistan, 4.2 million tons of toxic substances are released into the atmosphere annually. Of these, 60 percent is attributed to motor vehicles. As a result, the air quality in cities such as Andijan, Gulistan, Kokand, Karshi, Navoi, Tashkent, and Fergana is deteriorating dramatically. The emission of toxic waste in these areas exceeds the permissible norms by 6-9 times.

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