
ANTHROPOGENIC INFLUENCE ON ATMOSPHERIC AIR

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ABSTRACT: In this article The importance of the main emissions and sources of atmospheric pollution, the consequences of atmospheric pollution: "greenhouse effect", acid rain, "ozone holes" and others are revealed.

KEYWORDS: Atmospheric air, pollution sources, nuclear power plant, greenhouse effect, chemical industry, metallurgy, greenhouse effect, acid rain.

INTRODUCTION

Atmospheric air occupies a special place among other components of the biosphere. Its importance in the life of all living organisms on earth is huge. If a person can live up to five weeks without food, he can live up to five days without water, and only five minutes without air. In this case, the air must have a certain purity, any deviation from the norm is dangerous for health and life. Atmospheric air protects the Earth from the absolute cold of space, the flow of meteorites and the flow of dangerous ultraviolet radiation from the sun. Global meteorological processes take place in the atmosphere, weather and climate are formed.

The atmosphere has the unique property of being self-cleaning. In it, turbulent mixing in the atmospheric layer near the ground and washing of aerosols due to atmospheric precipitation, etc. take place. However, under current conditions, the self-cleaning capabilities of natural systems have been seriously impaired. Under anthropogenic influence, negative ecological consequences began to appear.

Air pollution means any change in its composition and properties to the extent that it negatively affects human health, animals, plants, and the entire ecosystem .

The atmosphere can be naturally and anthropogenically polluted or polluted naturally.

Natural air pollution occurs as a result of natural processes. Products of volcanic activity, rock flying and wind erosion products, plant pollen, forest and prairie fire smoke, meteorite combustion products, etc. are examples of them. Anthropogenic pollution is associated with the release of various pollutants in the processes of various human activities. Currently, this pollution is significantly greater than natural air pollution.

According to the scale of distribution, pollution is divided into the following types: local, regional and global. Local pollution is characterized by a high amount of pollutants in small areas (city, industrial area, agricultural area, etc.). At the regional level, pollution covers larger areas (continent or its part, geographical province, etc.). Global pollution completely covers the earth's atmosphere.

According to the state of the aggregate, wastes of harmful substances are described in the following order: dusty (sulfur dioxide, nitrogen oxides, carbon oxides, hydrocarbons, methane, ammonia, etc.), liquid (acids, alkalis, solutions of salts, etc.), solid (organic and inorganic dust, institution, compounds of heavy metals, etc.).

Sulfur dioxide, carbon monoxide and solid particles are the main air pollutants (pollutants) and they account for about 98% of the total volume of emissions of harmful substances. In addition to the main pollutants, about 70 harmful substances such as formaldehyde, hydrogen fluoride, phenol, ammonia, carbon sulfur and others are released into the atmosphere.

The total amount of major pollutants released into the atmosphere in 1990 was 401 million tons. The main sources of atmospheric pollution. The following sectors of the economy make the main contribution to atmospheric pollution: heat energy (thermal power plants, nuclear power plants, industrial and municipal boilers, etc.), ferrous and non-ferrous metallurgy, oil production and petrochemicals, construction material production enterprises, auto transport, agricultural farms. 50-60 percent of the harmful substances emitted by the transport account for this.

During the burning of solid (coal) and liquid (diesel) fuels, thermal power stations and boiler plants emit combustion products into the atmosphere either completely (carbon dioxide) or partially (carbon, nitrogen, sulfur oxides, hydrocarbons). At the same time, the amount of energy costs is huge. For example, a 2.4 million kW thermal power plant spends up to 20,000 tons per day and emits 680 tons of SO₂ and SO₃, 120-140 tons of solid particles (dust, soot), 200 tons of nitrogen oxides into the atmosphere during this time. The transition to liquid fuel will reduce emissions, while emissions of sulfur and nitrogen oxides will practically not decrease. The use of gas fuel is cleaner from an environmental point of view and reduces air pollution by 3-5 times.

Nuclear power plants can release toxic substances such as radioactive iodine, inert gases and aerosols into the atmosphere.

Ferrous and non-ferrous metallurgy. When melting ten tons of steel, 400 kilograms of solid particles, 300 kilograms of sulfur and up to 500 kilograms of carbon monoxide, small amounts of manganese, lead, phosphorus, mercury, mercury vapor and others are released into the atmosphere. Lead-zinc, copper and sulfate ore, aluminum production and non-ferrous metallurgical enterprises release toxic substances into the atmosphere.

Chemical industry. The amount of network waste is not very high (around 2% of the total amount). However, due to their high level of harmfulness (toxicity), diversity and concentration, they seriously harm people and biota in general. These wastes are fluorine compounds, ammonia, nitrous gases (nitrogen oxide mixture), chlorine compounds, hydrogen peroxide, sulfur oxides, inorganic dust, etc.

Motor transport. Gases emitted by internal combustion engines contain a large number of harmful compounds. These are: benz(a)pyrene, aldehydes, carbon and nitrogen oxides are extremely dangerous lead compounds.

In addition to the listed sectors, intensive atmospheric pollution occurs in mineral raw materials, oil and gas processing enterprises, waste incineration and burning of rocks, etc. In rural areas, livestock and poultry farms, meat production industrial complexes, pesticide spraying, etc. are sources of atmospheric air pollution.

Ecological consequences. Atmospheric air pollution affects the environment and human health (skin, mucous membranes, etc.) directly and cumulatively, by gradually damaging the various vital activity systems of the body. In many cases, air pollution causes damage to the structural components of the ecosystem to such an extent that the recovery process is completely disrupted and the homeostasis mechanism fails.

Local pollution with individual pollutants affects the environment. Sulfur dioxide combines with moisture to form sulfuric acid, which eats away at the pulmonary system of animals and humans. Dust containing silicon dioxide caused silicosis, a severe lung disease. Nitrogen oxides irritate the mucous membrane (eyes, lungs), even erode it, increase the body's susceptibility to viral diseases (flu, etc.). The presence of nitrogen oxides in the air together with sulfur dioxide and other harmful compounds is very dangerous.

Carbon monoxide poisoning can cause general weakness, dizziness, nausea, insomnia, fainting, and even death. Lead compounds affect the blood, nervous and genitourinary systems, reduce mental ability in children, accumulate in bones and other tissues.

Ozone irritates the mucous membranes of the respiratory organs, reduces protection against colds, aggravates chronic heart diseases, causes asthma and asthma.

Heavy metals and their compounds cause cancer, sexual dysfunction, and disability in newborns. A toxic mixture of smoke, fog, and dust - smog causes severe damage to Turkish organisms. Smog is divided into two types: winter (London) and summer (Los Angeles).

Los Angeles (photochemical) smog is caused by the intense action of solar radiation on air containing high concentrations of automobile exhaust gases. A complex photochemical reaction takes place in windy or calm weather. In this, very harmful photo-oxidants (ozone, organic compounds, nitrates, etc.) are formed. They irritate the mucous membranes of the lungs, gastrointestinal tract, and organs of vision.

The release of pollutants in large quantities and over a long period of time not only causes great harm to humans, but also has a negative impact on animals, plants and the entire ecosystem.

Harmful substances are absorbed by plants in different ways. They can have a direct effect on the green part of plants, being absorbed into the tissues, absorbing the tissue structure and chlorophyll. It also reaches the plant body through the root system. Gaseous pollutants have different effects on plant conditions. Some of them (carbon monoxide, ethylene, etc.) weakly neutralize leaves and young branches, others (sulfur dioxide, chlorine, mercury vapor, ammonia, etc.) have a destructive effect on plants. Sulfur dioxide is extremely dangerous, many types of trees die under its influence.

Animals, birds, and insects are poisoned by eating infected plants or by ingesting harmful substances directly into their bodies.

The main consequences of global atmospheric pollution: possible climate warming ("greenhouse effect") depletion of the ozone layer, acid rain.

"Greenhouse effect" is greenhouse gases in the atmosphere (carbon dioxide, methane, nitrogen oxides, chlorofluorocarbons (freons)) that absorb long-wave radiation and heat the atmosphere. At the same time, they do not prevent solar radiation from reaching the ground.

Thus, the atmosphere behaves like a greenhouse roof. However, in the modern approach, the contribution of greenhouse gases to global warming is not very large.

The ozone layer (ozonosphere) covers the entire globe. It is found at altitudes from 15 km to 50 km. Its maximum concentration is observed at altitudes of 20-25 km. Ozone concentration in the atmosphere has diurnal and seasonal variation and distribution by latitude. In the second half of the 20th century, local depletion of ozone concentration (ozone holes) was detected over various regions of the Earth.

Depletion of ozone reduces the ability of the atmosphere to protect living organisms on earth from the sun's ultraviolet rays. An increase in ultraviolet radiation leads to the development of skin cancer, eye diseases (cataract, etc.), decreased immunity, etc. Plants gradually lose their ability to photosynthesize as a result of strong ultraviolet radiation. Disruption of plankton life activity leads to disruption of the biota trophic chain in aquatic ecosystems.

Depletion of the ozone layer occurs under the influence of chlorofluorocarbons (freons), nitric acids and other pollutants. Chlorofluorocarbon emissions are released into the atmosphere in the production of cooling equipment and perfumery products. Freons rise in the atmosphere and have a destructive effect on ozone molecules.

Acid rain damages the environment. They turn into sulfuric and nitric acid as a result of the combination of sulfur and nitrogen dioxides released into the atmosphere from industrial enterprises with moisture in the atmosphere. The gross waste of these substances is 255 million per year. more than tons. As a result of acid rain, soil fertility decreases. They are absorbed by plants and soil organisms. This leads to negative consequences. For example, as a result of acid rain, an increase in the amount of aluminum in water by only 0.2 mg/liter will kill fish. The development of phytoplankton is drastically reduced.

Acid rain reduces the resistance of forests to drought, diseases, and pollution. This leads to the degradation of the natural ecosystem of forests.

Acid rain spills into open bodies of water are devastating to fish, plankton, and aquatic life.

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