

ХИМИЧЕСКИЕ НАУКИ

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IMPACT OF POLLUTIONS ON ENVIRONMENT

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ABSTRACT: Environment - is characterized by a combination of physical, chemical and biological facts that, under certain conditions, can have a direct or indirect immediate or remote effect on the activity and health of a person. At present, the protection of the environment has become very difficult, since it is associated with many factors. At the same time, the offshore waters of Hovsan and Gunashli regions have been taken and organic toxic substances have been identified in its content with the help of chromatographic analysis.

Keywords: environment, environment, pollutions, soil, technogenic impact, etc.

INTRODUCTION

The chemical composition of the atmosphere, natural waters, soils is formed not only due to natural, but also anthropogenic factors. Pollution is the result of incomplete and irrational use of extracted natural resources and imperfection of technology. Control of the purity of the atmosphere, the chemical composition of soils, natural and waste water is carried out by a system of control points. Such control allows, in principle, not only to fix the degree of contamination, but also to establish the source of contamination and localize it, to evaluate the effectiveness of the purification method used [1]. The quality assessment of atmospheric air and water is carried out according to the maximum permissible concentrations (MPC) of the components. Very strict requirements are imposed on the quality of water and air: the content of normalized components ranges from 100-1000 $\mu\text{g} / \text{l}$ (for very toxic 1-2 $\mu\text{g} / \text{l}$) for water and 1-100 $\mu\text{g} / \text{m}^3$ (and even less) for air. Consequently, the main difficulty arises in the analysis of these objects - the determination of components at a concentration level of up to 10-7-10-10%. This makes it possible to study the migration and transformation of contaminated substances in the biosphere [2].

Nowadays, technogenic effects on the atmosphere have caused such global changes as the "greenhouse effect", the destruction of the ozone layer, the fall of acid rain. All this leads to a global environmental crisis and requires an immediate transition to environmental management. It is the pollution of the atmosphere that depletes the adaptive capabilities of the human body to the greatest extent. The atmosphere has a powerful ability to self-purge of pollutants. The movement of air leads to dispersion of impurities. Dust particles fall from the air to the earth's surface under the influence of gravity and rainwater. Many gases dissolve in the moisture of the clouds and with the rains also reach the ground.

At present, the volume of harmful substances released to the atmosphere in the world has increased dramatically and amounts to many millions of tons. This exceeds the limits of the ability of the atmosphere to self-purification. Especially unfavorable is the ecological situation in the cities, where the largest industrial facilities are concentrated. The pollution of the atmosphere can take a dangerous character for some specific time in one area or another. This can occur both as a

result of emergency situations and due to changes in weather conditions. When the temperature changes, the fog, contaminated with smoke, clings to the surface of the earth, forming the so-called "smog", which irritates the mucous membranes of the eyes and upper respiratory tract, as well as exacerbation of lung diseases. Nuclear explosions in the atmosphere are dangerous for the ozone layer, since chlorine and nitrogen oxides enter it. Reduction of the concentration of O_3 in the ozone layer will lead to massive cancers of the skin in people, slowing down photosynthesis and the death of some plant species. The steady growth of toxic substances into the environment, first of all, affects the health of the population, the quality of agricultural products deteriorates, decreases productivity, affects the climate of individual regions and the state of the ozone layer of the Earth, leads to the death of flora and fauna.

Oxides of carbon, sulfur, nitrogen, hydrocarbons, lead compounds, dust and etc, which enter the atmosphere, have various toxic effects on the human body. The toxicity of CO increases with the presence of nitrogen in the air, in this case the concentration of CO in the air must be reduced by a factor of 1.5. Emissions to the atmosphere of engineering enterprises are: carbon monoxide, sulfur dioxide, dust and suspended matter, nitrogen oxides, xylene, toluene, acetone, gasoline, butyl acetate, ammonia, ethyl acetate, sulfuric acid, manganese, chromium, lead and so on [3].

Second half of XX century was characterized by rapid development of the chemical industry. At one time, the successes in the development of chemicalization brought unquestionable benefits. At present, the negative consequences of this process have become obvious.

Firstly, the release of chemical compounds into the environment increases every year. According to the World Health Organization (WHO), of the more than 6 million known chemical compounds, up to 500,000 compounds are actually used, of which about 40,000 are harmful to humans and 12,000 are toxic. Each fluorescent lamp contains 150 mg of mercury. For example, one broken lamp pollutes 500 thousand m^3 of air at the MPC level.

Secondly, the replacement of natural materials with synthetic ones leads to a whole series of unforeseen consequences. Biochemical cycles include a large list of synthetic compounds that are not characteristic

of virgin natural environments. For example, if soap gets into the pond, which is based on natural compounds - fats, then the water is self-cleaning. If synthetic detergents containing phosphates enter the water, this leads to the reproduction of blue-green seaweed and the pond dies.

Table 1

. The chemical load per inhabitant of the city for the lifetime

Hydrocarbons	CO	Pesticides	Fluorides	Phenol	Lead	Mercury	Heavy metals
2,8 t	4,2 t	140 kg	6,3 kg	2,1 kg	1 kg	12 g	1 kg

A chemical load means the total amount of harmful and toxic substances that enter the human body during its lifetime. Enterprises of the chemical and petrochemical industry are sources of a number of diverse toxic substances. Among them, first of all, include organic solvents, amines, aldehydes, chlorine, sulfur and nitrogen oxides, phosphorus compounds, mercury. Among pollutants, sulfur dioxide is a toxic gas that is readily soluble in water. The concentration of sulfur dioxide in the atmosphere is particularly high in the vicinity of copper smelters. It causes the destruction of chlorophyll, the underdevelopment of pollen grains, the drying and falling of leaves, needles. As a result of the combustion of various fuels, about 20 billion tons of carbon dioxide are released into the atmosphere each year. Anthropogenic emissions of carbon dioxide exceed natural ones and now constitute a large part of its quantity, violate the transparency of the atmosphere, and consequently its heat balance.

Constant increase in water consumption on the planet leads to danger, which necessitates the development of measures for the cost-effective use of water resources. In addition to the high level of consumption, water shortages, its growing pollution is caused by the dumping of industrial waste, especially chemical production and communication wastewater into rivers. Organic compounds such as polycyclic aromatic hydrocarbons (PAHs) and phenols are a global environmental problem, as they cause inflammation and cancer of the human skin. As its known, there are two types of anthropogenic source of hydrocarbons: these are petrogenic and pyrogenic sources [4].

The Caspian Sea is a very sensitive ecosystem. Over the past two decades, the impact of anthropogenic

and biochemical factors has sharply worsened the state of ecosystems in general, and especially the north-eastern part of the sea. Observations of recent years show that the waters of the Caspian Sea, especially along the coast of the National Park are also contaminated with oil and sewage. Over the past few decades, industrialization and urbanization in the Caspian region is developing rapidly and the associated increase in hydrocarbons is a concern in this region. Marine oil production and emergency oil spills, industrial waste, sewage, discharges draining with river water are considered the main source of anthropogenic hydrocarbons in the marine environment [5]. It is assumed that industry is the main source of oil pollution in the Caspian Sea. The total amount of industrial waste emitted into the Caspian Sea averages 2342.0 million m³ per year. Such waters contain 122.5 thousand tons of oil, 1.1 thousand tons of phenols, 9.9 thousand tons of organic chemistry products.

EXPERIMENTAL PART AND EXPLANATION OF THE RESULTS

Water samples has been taken for analysis from the two sites: Gunashli and Hovsan coasts at depths of 0.5 m from the sea level with the "12 L Niskin" sampler. Quality analysis of crude oils were carried out with A flame-ionizing GC equipped with ZB-1 (Phenomenex, USA) -FID 6890 (Agilent, USA) gas chromatographic detector. In the analysis, helium was used as a gas-bearing agent.

Near the coastal areas of the Caspian Sea-Gunashli and Hovsan, samples of sea water contaminated with organic substances were taken and determined (Table 2).

Table 2.

Contamination of sea water with organic substances

Organic substances, mg/l	Gunashli	Hovsan
Naphthalene	0.09	0.19
Acenaphthylene	<0.01	<0.01
Acenaphthene	0.01	0.01
Fluorene	0.04	0.07
Phenanthrene	0.09	0.17
Anthracene	0.01	0.01
Fluorent	0.01	0.01
Pyrene	0.01	0.01
Benzo (a) anthracene	<0.01	<0.01
Hoary	0.02	0.01
Benz (b + k) fluoranthene	0.01	0.03
Benzo (a) furan	0.01	0.01
Indeno (1,2,3) pyrene	<0.01	<0.01
Benzene	<0.01	<0.01
Dibenzanthracene	<0.01	<0.01

Pollution of soil cover with pesticides and industrial waste, mercury, lead, iron, copper, zinc, manganese, nickel, aluminum and other metals (near large centers of ferrous and non-ferrous metallurgy), radioactive elements (as a result of precipitation from atomic explosions or Removal of liquid and solid wastes from industrial enterprises, nuclear power plants or research institutes associated with the study and use of atomic energy), persistent organic compounds used as pesticides. They accumulate in soil and water and, most importantly, they are included in ecological food chains: they pass from soil and water to plants, animals, and eventually to the human body with food[6]. Unskillful and uncontrolled use of any fertilizers and pesticides leads to disruption in the circulation of substances in the biosphere.

An important part of the soil is a complex of specific organic compounds. Terrestrial and internal soil organisms, after their death in the form of lifeless organic matter, enter the soil. As a result of microbiological and partly chemical and physico-chemical processes, this substance undergoes complex biochemical transformations. Organic compounds entering the soil as part of plant and animal organisms are either destroyed to simple inorganic compounds (CO₂, H₂O, NH₃, etc.) or converted to new organic compounds. Protection of the environment and rational use of natural resources - professional activities aimed at preserving and restoring the natural environment, rational use and reproduction of natural resources, prevention of

pollution, degradation, damage, depletion, destruction, destruction and other harmful effects on the environment through economic and other activities and the elimination of its consequences [7].

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