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ENVIRONMENTAL PROBLEMS OF UZBEKISTAN AND SOLUTION TO THEIR PROBLEMS

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Abstract: A new approach to the problem of preparing absorbents for fluoride gases in industrial production is proposed and scientifically substantiated, based on the rational use of mechanochemical methods of influencing the molding system and making it possible to obtain cheap, highly active sorbents for the sanitary purification of waste gases.
Key words: environmental problem, harmful gases, production, methods, purification, sanitary cleaning.

ЭКОЛОГИЧЕСКИЕ ПРОБЛЕМЫ УЗБЕКИСТАНА И РЕШЕНИЕ ЭТИХ ПРОБЛЕМ

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The effectiveness of measures to protect the air environment from pollution by technogenic impurities is determined by the reliability of environmental monitoring tools. The nature of society's interaction with the environment has recently caused concern among the general

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public. The human environment is becoming increasingly polluted, and its ability to self-regulate is falling catastrophically. Diseases that were previously either not observed at all or were local in nature are spreading widely. They are called “diseases of civilization.”

Both the natural and social environments need to be protected and improved. A person experiences a feeling of discomfort and falls ill both from a violation of the ecological balance in nature and from contamination of the social environment.

The ecological state of the Republic of Uzbekistan is extremely worrying. The soil, air and water are polluted. The extraction of minerals is carried out irrationally, and nature is becoming scarcer. Nature also suffers from the intensive collection of fodder, medicinal and edible herbs and shrubs. Intensive collection of raw materials, unregulated grazing, and recreational pressure on landscapes lead to a reduction in the country's biomass reserves.

To preserve the natural environment and solve environmental problems, the level of environmental culture of the entire society plays an important role. In order to form and develop an environmental culture among the population, it is necessary to create a special methodology for environmental education, based on which and with the help of which people could control their actions and actively form an environmental culture.

Uzbekistan has always expressed its concern about the consequences of the impact of emissions from aluminum production, both on the environment and on the health and gene pool of the population. Back on November 17, 1994, in Tashkent, an agreement was signed between Uzbekistan and Tajikistan on cooperation to improve the environmental situation in areas influenced by the activities of the aluminum smelter in Tursunzade. Unfortunately, a number of the agreement’s measures were never implemented by the Tajik side.

Representatives of UNEP, along with other international experts, personally familiarized themselves with specific facts on the spot and saw with their own eyes the consequences of

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industrial activity in the Sariasy, Uzun, Denau, Altynsay, Shurchin, Kumkurgan districts of the Surkhandarya region of Uzbekistan, where more than 600 thousand people live.

Currently, during the production of phosphate fertilizers, hydrogen fluoride, fluorine, phosphoric acid and other fluoride compounds, large quantities of various fluorine-containing gases are released that pollute the environment. Even 20–25 years ago, with relatively small fluoride emissions, it was possible to reduce the fluorine content in the exhaust gases to the required level using any gas scrubbing devices. Every year the scope of application of phosphorus fertilizers expands and the scale of production increases; the amount of hydrogen fluoride, silicon tetrafluoride, elemental fluorine and other fluorine-containing compounds released into the gas phase in gaseous form, or in the form of aerosols, or dust increases annually. The need to capture them is dictated both by economic considerations, in particular, by the acute shortage of fluorine and its compounds, and by their very harmful effects on the surrounding wildlife.

The recovery of hydrogen fluoride from technical gases is due to its high cost and harmful effects on the environment. Sources of emissions of fluorinated gases can be divided into two main types: process gases from enterprises processing fluorine-containing raw materials and process gases from enterprises using fluoride compounds as reagents, additives and catalysts. It should be noted that with the sulfuric acid method of producing phosphorus fertilizers, which is widely used in practice, it is possible to extract only half of the fluorine found in the raw materials. The rest of it (19–25%) goes with fertilizers, phosphogypsum, waste gases and wastewater, the rest is removed into the gas phase. When processing slag from a phosphorus furnace, furnace gas components dissolved in the slag are released into the air. The presence of fluorine, phosphorus, and sulfur compounds in the gas phase was qualitatively established. For example, the content of fluorine compounds in gases at the granulation stage is 10–20

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mg/nm3, and when producing slag pumice in a pilot plant it is 52–188 mg/nm3. In this regard, the requirements for the maximum permissible concentration of fluorine compounds in the gas phase are becoming increasingly stringent.

At this stage of development in industry, there are quite a lot of methods for capturing fluorine-containing compounds. Research aimed at deep extraction of fluorine from the gas phase by water absorption has in most cases not yielded positive results. This is explained, firstly, by the rather significant equilibrium concentration of fluorine in the gas phase over acid solutions (12–15 kg/m3 at 50°C), and secondly, part of the fluoride compounds is present in the form of an aerosol, the capture of which does not obey the laws of ordinary absorption .

One of the most promising is the adsorption purification method on a solid sorbent, the advantage of which is a significant reduction or complete elimination of harmful discharges. Fluorides, oxides, hydroxides, carbonates, chlorides, sulfates and other inorganic metal compounds can be used as absorbers for the sorption of fluoride compounds. The most widely used absorbers are those whose interaction is accompanied by the formation of gases and vapors (O2, H2O, etc.) that do not cause atmospheric pollution. The use of adsorption purification of waste gases makes it possible to solve two problems - sanitary purification of waste gases and regeneration of fluorine in order to return it to the technological cycle for the production of fluorine-containing products, which can significantly reduce the cost of the latter. Currently, the development of new and modernization of existing technologies for the creation of sorbents for purification of industrial waste gases from fluorine compounds continues.

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Scientists, ecologists and specialists have proven that the accumulation of fluorides in the environment of this region causes degradation of flora and fauna, disrupts the balance of synthesis and mineralization processes, and contributes to the emergence of mutation processes. Fluoride compounds cause the spread of fluorosis, developmental anomalies of the musculoskeletal, respiratory, and endocrine systems. The birth of children with birth defects has become commonplace here. It is of particular concern that from year to year in the area affected by the enterprise, the incidence of diseases is growing, the number of premature births and miscarriages, congenital deformities and stillbirths is increasing.

In connection with the above, it becomes relevant to control macro- and microconcentrations of hydrogen fluoride, which represents one of the most important safety tasks in its production and protection of environmental objects. Solving the listed problems of quickly establishing the degree of danger and harmfulness of hydrogen fluoride in air mixtures is possible only through the development of new express methods that have the necessary dynamic parameters and metrological characteristics.

The most correct and correct solution to the problems of rapid and accurate determination of hydrogen fluoride in the air is the creation and use of simple, highly accessible and cheap sensors. In this regard, the task of developing effective methods based on semiconductor effects and creating on their basis instruments for monitoring hydrogen fluoride is an urgent problem of modern analytical chemistry and ecology.

To detect hydrogen fluoride in the air, various methods are used, the choice of which is determined by the impurities that accompany hydrogen fluoride in the air and air mixtures.

Formation of industrial gases and ventilation emissions containing hydrogen fluoride, chlorine and organic substances. The lime method has a number of advantages: low cost, availability of the reagent, no need to carefully protect equipment from corrosion since the environment is

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alkaline. The disadvantages of this method are the low degree of purification and insufficient use of absorbent.

azoic chlorine and fluorine are well absorbed by solid organic compounds such as lignin and calcium lignosulfonate. However, it is more effective to use these absorbers in the idea of aqueous solutions and pulps. As solid absorbers of hydrogen chloride from industrial waste gases, they can be used. iron oxide chloride and cuprous chloride, lead, cadmium, and some organic polymer materials were used. Absorption purification is a continuous and, as a rule, cyclic process, since the absorption of impurities is usually accompanied by the regeneration of the absorption solution and its return at the beginning of the purification cycle. During physical absorption, the regeneration of the absorbent is carried out by heating and reducing the pressure, resulting in desorption of the absorbed gas impurity and its concentration.

The development is ready for implementation: there are certificates of laboratory and experimental industrial tests, there are experimental laboratory samples, technological regulations and technical conditions, they have the best metrological characteristics and operational parameters that meet the requirements of the relevant GOST 52033–2003 for devices of similar classes.

Environmental issues in Uzbekistan are a relevant and increasingly important topic. Despite the fact that Uzbekistan has rich natural resources and unique ecosystems, many of them are subject to destruction and deterioration due to human activity and climate change. Water pollution, deforestation, urban pollution and other environmental problems have a serious impact on public health and the country's biodiversity. One of the main challenges facing Uzbekistan in the field of ecology is the pollution of water and soil resources. This occurs as a result of industrial activities, non-compliance with environmental requirements during the storage and transportation of hazardous substances, as well as the use of outdated technologies and equipment.

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In addition, deforestation continues in Uzbekistan due to the expansion of agricultural land and the construction of new facilities. This has a negative impact on the biodiversity and climatic conditions of the region.

The importance of solving environmental problems for Uzbekistan lies not only in preserving the environment and biodiversity, but also in improving the quality of life of the population and developing the economy. After all, ecosystems play a key role in ensuring food security, protecting against natural disasters and creating jobs in the ecotourism and clean technology sectors. At the same time, Uzbekistan is one of the first in the region that began to realize the need to preserve the environment and transition to sustainable development. In this article we will look at the main environmental problems of Uzbekistan, as well as measures taken by the state and society to preserve nature and achieve sustainable development.

1) Pollution of water and soil resources

One of the main environmental problems in Uzbekistan is the pollution of water and soil resources. This is due to a lack of control over emissions of harmful substances into the atmosphere, improper storage of pesticides and fertilizers in the fields, as well as untreated wastewater discharged into water bodies. The government of Uzbekistan is taking measures to address this problem, including the creation of new treatment facilities, the introduction of new technologies to reduce emissions of harmful substances, and strict controls over the storage of hazardous chemicals.

2) Deforestation

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Deforestation continues in Uzbekistan due to the expansion of agricultural land and the construction of new facilities. It has a negative impact on the biodiversity and climatic conditions of the region. In this regard, the government of Uzbekistan is developing programs to create reserves and protected natural areas, as well as conducting large-scale reforestation campaigns.

3) Ecotourism

Ecotourism is becoming increasingly popular in Uzbekistan due to the country's unique ecosystems and cultural attractions. It represents an opportunity not only for the development of tourism, but also for protecting the environment and preserving biodiversity. The Government of Uzbekistan actively supports the development of ecotourism by providing financial assistance and creating conditions for the development of ecotourism sites

4)Energy efficiency

Uzbekistan is implementing projects to improve energy efficiency in industry and the residential sector. These include installing new equipment that uses less energy and implementing energy-saving systems in buildings. Such measures help reduce emissions of harmful substances, conserve natural resources and reduce energy costs.

5)Creation of protected natural areas

The government of Uzbekistan is actively creating reserves and protected natural areas to preserve the country's unique biological and natural environment. These measures help protect rare species of plants and animals, prevent the extinction of ecosystems and the destruction of natural conditions for humans.

6)Increasing environmental awareness

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An important element in solving environmental problems is increasing environmental awareness of the population of Uzbekistan.

The government and public organizations are conducting various environmental education campaigns, events and programs to increase people's awareness of environmental issues and the importance of preserving it for future generations. Uzbekistan also creates conditions for the active participation of citizens in solving environmental problems. For example, volunteers conduct waste collection campaigns in natural areas and cities, and also participate in reforestation work. In general, the government of Uzbekistan and public organizations are making significant efforts to protect the environment and combat environmental problems. However, a lot of work remains to preserve biodiversity and improve the environmental situation in the country. In this issue, a key role is played not only by the government, but also by every citizen who can contribute to preserving the environment and creating a sustainable future for Uzbekistan and the entire world community.

Advantages and Disadvantages

Advantages:

• Uzbekistan recognizes the importance of environmental issues and is taking measures to address them, which can lead to an improvement in the environmental situation in the country.

• The development of ecotourism can become one of the key areas for the development of the tourism industry, improve the standard of living of the population and create new jobs.

• The introduction of new technologies and energy saving systems can not only reduce emissions of harmful substances, but also have a beneficial effect on energy costs in industry and the residential sector. Flaws:

• Despite the measures taken, environmental problems in Uzbekistan remain significant, and their solution requires additional efforts and funding.

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• Some problems, such as air and water pollution, are associated with the activities of large industrial companies, making them difficult to control and regulate.
• Some measures, such as the creation of new protected areas, may reduce access to some resources and make the living conditions of local people more difficult.

Overall, Uzbekistan is faced with serious environmental problems that require attention and solutions. The government and public organizations are taking measures to solve them, but to achieve significant results, constant attention to this problem is necessary from all participants in society.

Social Impact of Ecology

Environmental problems in Uzbekistan have a serious social impact on the lives of the local population. For example, contamination of water and soil resources can lead to disease and reduced access to clean water and food.

Deforestation can worsen the living conditions of local communities, reduce the number of plant and animal species, and worsen climatic conditions in the region. This can lead to difficulties in agriculture, the economy and social life in general.

However, addressing environmental issues can also have a positive social impact. For example, the development of ecotourism can help create new jobs, improve the standard of living of the population, as well as preserve natural resources and biodiversity. Measures to improve energy efficiency and reduce emissions can improve air quality and public health, and reduce energy costs.

Also, the creation of protected natural areas can contribute to the conservation of rare species of plants and animals, which can have a positive impact on the cultural and ecological connection of the local population with nature. In general, environmental problems in Uzbekistan have a serious social impact on the lives of the local population. However, solving these problems can have a positive effect on the standard of living, health and well-being of citizens.

Impact of the State

The state in Uzbekistan plays a significant role in solving environmental problems. The government is taking measures to reduce emissions of harmful substances, create new treatment facilities, reforestation, develop ecotourism and create protected natural areas.

For example, the government is introducing new technologies and energy-saving systems in industry and the residential sector, which helps reduce emissions and energy costs. The government also creates reserves and protected natural areas to protect the country's unique biological and natural environment.

However, in practice, implementation of measures to solve environmental problems can be difficult due to lack of funding and technical capabilities. In addition, in some cases, the activities of large industrial companies may have a negative impact on the environment.

It is also worth noting that Uzbekistan has restrictions on freedom of expression and citizens' rights to access information, which may hinder the development and implementation of environmental programs and public participation in this process. In general, the state plays a key role in solving environmental problems in Uzbekistan. It is necessary to continue to create conditions to remove obstacles to solving these problems, as well as to raise public awareness of the importance of preserving the environment and biodiversity.

Environmental problems are a serious problem not only for Uzbekistan, but also for the entire world community. The environment influences human health, economic development,

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international relations and public life. In Uzbekistan, environmental problems are becoming increasingly urgent due to population growth, industrial and agricultural development, and climate change. Much attention is paid to preserving biodiversity, combating water pollution, protecting the health of citizens and creating conditions for sustainable economic development. Research in the field of ecology is of great importance for the development and implementation of programs to protect the environment, raising public awareness of the importance of environmental issues, identifying new methods and technologies for solving environmental problems.

Also, research in the field of ecology is important for the formation of a global understanding of environmental issues and the development of international relations in this area. In general, the study of environmental problems is a relevant and important area for scientific research, which requires additional efforts and funding in Uzbekistan and the entire world community.

To improve the environmental situation in Uzbekistan, research can help in identifying the causes of environmental problems and developing effective methods to combat these problems. This could include research to identify sources of environmental pollution, create new methods for water and air purification, develop new technologies to improve energy efficiency and use renewable energy sources. Research could also help build global understanding of Uzbekistan's environmental problems and provide information on best practices and solutions in other countries. Research can also help raise public awareness of environmental issues, which can lead to changes in people's behavior and increase their contribution to preserving the environment.

In general, conducting research in the field of ecology is of significant importance for the development of a sustainable and environmentally responsible society in Uzbekistan. This will help preserve biodiversity, protect public health and create conditions for sustainable development of the economy and society as a whole.

Conclusion

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Environmental problems are one of the significant and current topics in Uzbekistan. The country's government is taking measures to solve them, but these problems continue to remain serious challenges for society. Research in the field of ecology is of great importance for the development and implementation of environmental protection programs, raising public awareness of the importance of environmental issues, and identifying new methods and technologies for solving environmental problems. Although the government is already taking steps to address environmental issues, much work still needs to be done. There is a need to improve the working environment for scientists and environmental experts, as well as to create a global understanding of environmental problems and participate in the international community to address these problems. In general, solving environmental problems in Uzbekistan requires an integrated approach and efforts of all participants in society, from government agencies to ordinary citizens. However, if we all work together, we can preserve our planet for future generations and create an environmentally sustainable and prosperous society.

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