

ӘЛ-ФАРАБИ АТЫНДАҒЫ ҚАЗАҚ ҰЛТТЫҚ УНИВЕРСИТЕТИ
КАЗАХСКИЙ НАЦИОНАЛЬНЫЙ УНИВЕРСИТЕТ ИМЕНИ АЛЬ-ФАРАБИ
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**«GLOBALLY INTERCONNECTED: NEW OPPORTUNITIES
AND CHALLENGES FOR SUSTAINABLE DEVELOPMENT» АТТЫ
IV ХАЛЫҚАРАЛЫҚ ҒЫЛЫМИ ЖӘНЕ
ОҚУ-ӘДІСТЕМЕЛІК КОНФЕРЕНЦИЯНЫҢ
ҒЫЛЫМИ ЖӘНЕ ОҚУ-ӘДІСТЕМЕЛІК МАҚАЛАЛАР
Ж И Н А Ғ Ы**

С Б О Р Н И К
научных и учебно-методических статей
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**«GLOBALLY INTERCONNECTED:
NEW OPPORTUNITIES AND CHALLENGES
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Пайдаланылған әдебиеттер тізімі

1. Севда Фатуллаева*, Ділгам Тағиев, Низами Зейналов «Энтеросорбенттер және олардың клиникалық тәжірибеде қолданылуы» Академик М.Ф.Нагиев атындағы катализ және бейорганикалық химия институты-тының Наноқұрылымдық металл-полимерлі катализаторлар бөлімі 2021.

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THE EFFECT OF PHOSPHATE MINERALS ON THE ENVIRONMENT

Андатпа. Мақалада фосфат минералдарының қоршаған ортаға әсерінің оң және теріс жақтары көрсетілген.

Кілт сөздер: фосфат минералы, фосфат жыныстары, тыңайтқыш, ауыл шаруашылығы, балдырлар, сапа.

Аннотация. В статье указано о положительном и негативном влиянии фосфатных минералов на окружающую среду.

Ключевые слова: фосфатные минералы, фосфатные породы, удобрение, сельское хозяйство, водоросли, качество.

Abstract. The article talks about the positive and negative effects of phosphate minerals on the environment.

Keywords: Phosphate minerals, phosphate rocks, fertilizer, agriculture, algal, quality.

Phosphate is essential for all life, phosphate-containing materials are the basis for agricultural fertilizers that provide the volume of food production. However, it also entails harm to the environment and human health.

Phosphate rocks are by far the most important phosphorus-bearing raw material used in the fertilizer industry. They are the primary source of phosphorus (P), which is an essential element for agriculture and various industrial applications (e.g., animal feed, cosmetics, and electronics). Phosphate rocks are also likely to host significant amounts of rare earth elements (REE), making them a potential REE resource given their production volume all over the world. Similarly, phosphate rocks are also considered to be an unconventional source of uranium, especially in certain deposits, where it can reach high concentrations. Other elements—such as cadmium, radium, and thorium, which could also be enriched in certain phosphate rocks—are currently weighing heavily on their production and transformation. Phosphorus in phosphate rocks is always combined with other elements in the form of phosphate minerals, of which the most common and widely distributed belong to the apatite group [1].

Intensive farming methods require the use of very large quantities of chemicals produced in industry-fertilizers, pesticides. Their use guarantees high yields, improves the quality of agricultural products and prevents excessive losses. However, with the development of agricultural chemicalization, its negative impact on the environment also increases. The increase in the number and capacity of enterprises producing fertilizers is also associated with increased pollution of the environment with harmful gaseous, liquid and solid waste. In agriculture, undesirable consequences from the application of mineral fertilizers arise mainly due to unjustified overestimation of their doses. This leads to a deterioration in the quality of the crop and the ingress into the biosphere (into the soil, reservoirs, atmosphere) of a significant amount of chemicals unused by plants. The use of large doses of fertilizers with water-soluble phosphorus causes soil erosion and deterioration of its structure. From an excess of fertilizers and pesticides, in particular herbicides and their

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decomposition products, not only harmful but also useful insects and plants die, the number of birds and some types of useful animals decreases [2].

Phosphate is the main cause of eutrophication, which poses various risks to humans, animals and plants. For several years, the existence of phosphate in the different water resources has been an expanding phenomenon from different sources, yet the two most high risk sources are; i) the presence of phosphate in sewage waters and phosphate traces in the treated sewage effluent (TSE), ii) the runoff from agricultural lands due to phosphate fertilizers spreading and dissolution in rain water and consequently the discharge of phosphate into rivers and other surface and underground water resources. The issue of phosphate from fertilizer runoff has been shown to cause extreme algal growth and microcystins (MCs) production in surface waters. The presence of toxic red algae and dinoflagellates on the seashore areas has caused the loss of millions of dollars' worth of fish farming stocks, thus resulting in more economic upheavals. There is an increasing global environmental concern about MCs growth caused by phosphate eutrophication and algal blooms. MCs represent a class of toxins that can accumulate in an aquatic environment, leading to decreased aquatic diversity and problems in fish farming. MCs can also be transported to drinking water and enter the food chain through irrigation and can hence affect human health [3].

Currently, environmental problems related to the interaction of the phosphorus enterprise with the environment, with the spread of soluble phosphorus compounds, the formation of a significant amount of waste and harmful emissions are relevant. The industrial regions themselves are turning into focal zones of profound changes in the lithosphere and biosphere. As noted, in the five-kilometer zone of influence of enterprises producing phosphorus and phosphorus fertilizers, the concentration of fluorine sometimes reaches 100-200 mg/m³. Under the influence of such emissions, photosynthesis decreases, vegetation suppression is observed. According to the qualitative composition and harmfulness of emissions, phosphorus production enterprises belong to industrial productions that have emissions of gases or aspiration air into the atmosphere containing carcinogenic and toxic substances [4].

It is important to be aware of the potential risks of phosphate minerals, and to take steps to minimize their negative impacts on the environment. With proper management and regulation, the benefits of phosphate minerals can be maximized, while minimizing their environmental risks.

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ҚАРАҒАНДЫ ОБЛЫСЫНДАҒЫ ҚОРШАҒАН ОРТАҒА ТЕХНОГЕНДІК ӘСЕРДІ ЭКОНОМИКАЛЫҚ-ГЕОГРАФИЯЛЫҚ БАҒАЛАУ

Аңдатпа. Қарағанды облысындағы қоршаған ортаның жағдайын экологиялық-географиялық бағалай отырып, техногендік әсерден алдын алуға жағдай жасау.

Кілт сөздердер: Қарағанды облысы, атмосфера, гидросфера, техногендік әсер, ластанушы заттар.

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