STUDY AND ANALYSIS OF THE PRODUCTION AND PROCESSING OF CHEMICAL PRODUCTS AROUND THE WORLD AND THE LARGEST CHEMICAL COMPANIES IN UZBEKISTAN

Fozilova Firangiza Komilovna
Doctor of economic sciences, professor Makhmudov Nosir Makhmudovich PhD
researcher of Tashkent state university of economy

https://doi.org/10.5281/zenodo.7313132

Abstract*. This article examines major manufacturers of chemical products, the development of the global chemical industry, the growing importance of the petrochemical industry, the commodity structure of global chemical products,the production and processing of fertilizers and the leading countries in the trade of chemical products in general are analyzed.*

Keywords: *chemical industry, technical state of production, structural transformations, world trade, commodity structure, modernization, chemicals, fertilizers.*

ИЗУЧЕНИЕ И АНАЛИЗ ПРОИЗВОДСТВА И ПЕРЕРАБОТКИ ХИМИЧЕСКИХ ПРОДУКТОВ ПО ВСЕМУ МИРУ И КРУПНЕЙШИЕ ХИМИЧЕСКИЕ КОМПАНИИ УЗБЕКИСТАНА

Аннотация. *Данная статья рассматривает крупных производителей химических товаров, развитие мировой химической промышленности, рост значимости нефтехимической промышленности, товарная структура мировой химической продукции,Проанализировано производство и переработка удобрений и страны — лидеры по торговле химических продуктов в целом.*

Ключевые слова: *химическая промышленность, техническое состояние производства, структурные преобразования, мировая торговля, товарная структура, модернизация, химические вещества, удобрения.*

INTRODUCTION

The chemical industry is one of the largest producing branches of the modern world economy. In the structure of world industrial production, it is currently much inferior only to mechanical engineering. The range of products produced by the industry has thousands of names, their number is constantly growing. Chemical products have an extremely wide scope of application and close relationships with many other industries, which is why a number of chemical products are often considered as part of other industry blocks (for example, within the framework of existing foreign trade classifiers).

The chemical industry plays a significant role in the formation of the most important macroeconomic indicators of the country. The level of chemicalization is a universally recognized criterion of scientific and technological progress in the world practice. In the leading countries of the world, the industry's share in the production of industrial products reaches 10-13 percent.

MATERIALS AND METHODS

The modern world market of chemical goods is characterized by a wide range, an increase in environmental safety costs, increased competition for sales markets, a decrease in the price competitiveness of chemical products from leading countries of the world (primarily Western European) relative to goods from countries with cheap labor resources. Global changes in the structure of global production and consumption of chemical products have led to the

restructuring of leading chemical companies. The restructuring of chemical companies is taking place against the background of the desire to save money, the introduction of highly efficient environmentally friendly technologies, the preference for the production of qualified chemicals (with high added value), the expansion of the network of branches in countries with cheap labor resources. [2]

In the future, biotechnological production will become increasingly important. Modern structural changes consist in an increase in the share of knowledge-intensive production of organic chemistry, plastics, pharmaceuticals, as well as processing and basic sub-sectors and a decrease in the share of industries processing raw materials and producing intermediates.

The main trends in the development of the global chemical industry are: stricter environmental standards; the increase in the cost of labor and energy resources in an effort to optimize production; the transition to safe and efficient technologies, the specialization of companies on products with high added value; rapid development of technologies; emphasis on small production lines; increased concentration of production; change of strategy of the largest companies; growth the importance of the petrochemical industry; an increase in the specific weight of gas raw materials.

RESULTS

The improvement of mechanisms should ensure the formation of transparent integrated corporate structures and the creation of investment attractiveness of chemical industry enterprises. The problems of industrial production growth, active development of enterprises, their adaptation in the conditions of socio-economic transformation are reflected in the works of domestic and foreign scientists.

"We live in a material world, we are surrounded by substances. We ourselves are essentially some kind of chemical factories, where billions of chemical reactions occur every second," Mikhail Egorov, the director of the Zelinsky Institute of Organic Chemistry, Academician–Secretary of the OHNM, took the floor. "Today, more than 100 million chemical compounds are known all over the world, and their number increases by at least 20 thousand every day. That is, chemistry has almost unlimited possibilities, and the future of our country will largely depend on how developed it is. Let me remind you of the words of scientist Leonid Kostandov: “What is chemistry, such is life”[1].

Egorov noted that from 1965 to 1980, when Kostandov was the Minister of Chemical Industry, the largest program of chemicalization of the national economy of the country was implemented in the USSR: over 400 new enterprises were built, as a result of which the chemical industry in the Soviet Union was one of the best in the world, and the country ranked first in terms of production of fertilizers and products of high processing.

The academician said that the total volume of chemical production in the world is 4 trillion US dollars, which is about 8.3% of global GDP. One workplace in the chemical industry provides 8 jobs in related fields. Global investments in production amount to more than 190 billion dollars a year, more than 52 billion are allocated annually for research and development. The production of chemical products is broadcast on 98% of goods. Chemistry is a stimulating industry: the aerospace industry depends on chemistry by 100%, the automotive industry by 100%, resource extraction by 100%, etc.

A significant contribution to the historiography of the formation of the chemical industry of Uzbekistan is made by the works of A.D.Dulman, which reveal various aspects of the

development of the chemical industry, the problems of the industry, the ways of their development [2].

However, it should still be noted that the issue of the creation of the chemical industry is disclosed unilaterally. They did not cover the consequences of intensive construction of chemical production. In addition, chronologically they cover the period mainly before the chemical industry in the USSR (under the general ed. Kazaryan P.E.).

The historical experience and problems of the development of the chemical industry at different stages of the history of Uzbekistan are studied in special dissertations. These are the dissertations of M.R.Sharifkhotszhayeva, H.Sahabutdinova, M.Urinbaev, S.Badridinov, Sh.Askarova [3].

Among the dissertation studies, it should be noted the works of S.Badricinov and Sh.M.Askarov, written in the conditions of the real changes that have begun, the ideology of society. They differ in new approaches and give a clearer and more correct idea of the problems associated with the development of the chemical industry in Uzbekistan.

At the same time, the research of these authors considered, as a rule, individual problems of the functioning and development of the chemical industry at various levels of management, or considered these issues related to other industries.

The improvement of organizational and economic support for the development of chemical industry enterprises should be carried out within the framework of a single strategy by implementing interrelated measures at all levels of management related to this area, including industry as a whole, the petrochemical industry, regional industrial complexes and individual economic entities.

This work is an abridged version presenting the results of the research work carried out by the author in the direction of research on the evaluation of the chemical industry and the production of fertilizers. The paper uses the following methods: content analysis, which allowed aggregating existing approaches to understanding the essence and tasks of development mechanisms; scientific synthesis aimed at developing practice-oriented solutions on the stated topic.

The enterprises of AO "Uzkimesanoat" can be divided into the following main production complexes according to the type of products produced:

complex of mineral fertilizers production, complex of inorganic substances and chemical reagents production for energy, gold mining, chemical industry;

production of chemical plant protection products;

soda ash production;

production of polymer and rubber products.

Currently, the enterprises of AO "Uzkimesanoat" produce more than 170 types of chemical products. At the present stage, the main task of the industry is to significantly reduce the volume of imports of raw materials by developing new types of products, in order to achieve raw material independence for particularly important types of products. Achieving this goal involves expanding the range and increasing the competitiveness of exported products, increasing the export potential of the industry through the use of local resources, the implementation of technical re-equipment and reconstruction of existing production facilities, the creation of joint ventures with foreign partners and attracting foreign investment. The basis of the modern structure of the industry is determined mainly by the developed production of

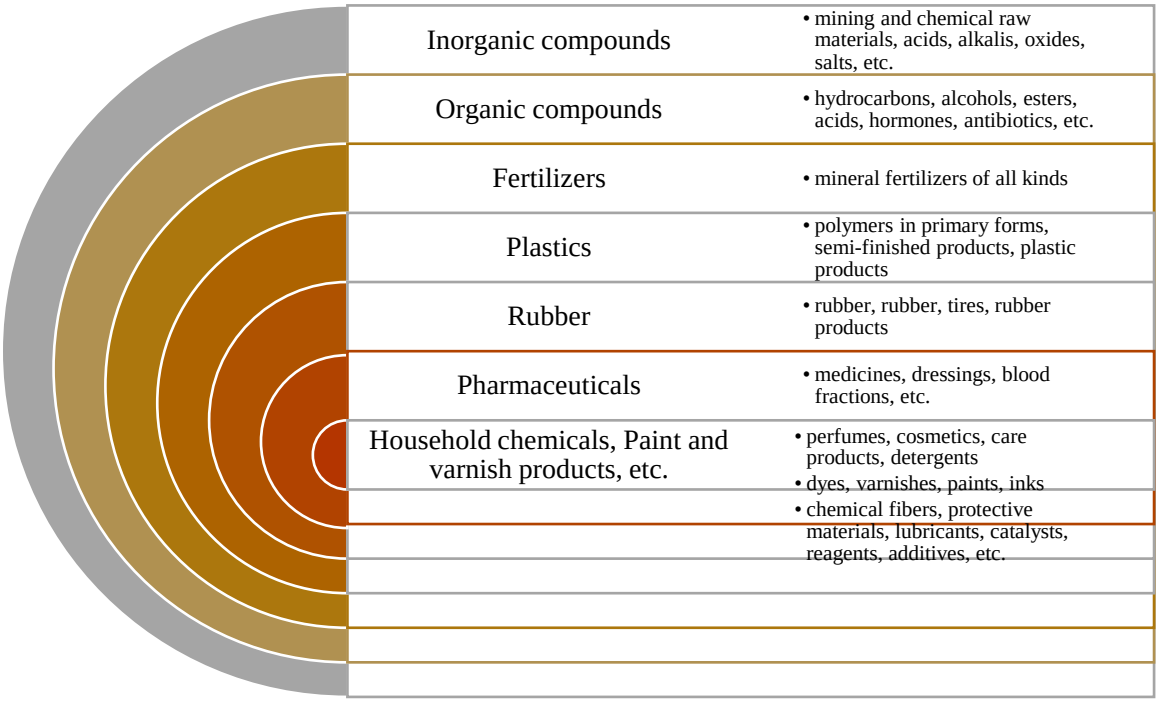
mineral fertilizers, primarily nitrogen and phosphorus, which account for more than half of the gross output of the industry. The production and processing of synthetic materials and polymers, as well as the production of consumer goods, has been developing at an accelerated pace in recent years.

Currently, the industry enterprises are undergoing the process of modernization, re-equipment of production workshops and updating equipment based on high technologies [5].

The creation of modern enterprises for the production of competitive chemical products on the world market and the implementation of projects for the modernization and reconstruction of existing production facilities, including the expansion of production of phosphorus fertilizers by attracting both foreign and domestic investments remain the main priorities for the development of the chemical industry in the near future.

Chemical goods account for 13% of the value and about 10% of the physical volume of international trade In 2021. The world market of chemical products in value terms amounted to about 6.4 trillion dollars. The largest segments of the chemical market by value are plastics (about 25%), pharmaceutical products and organic compounds (20% each). By tonnage, inorganic compounds (25%), plastics, organic compounds (20% each) and fertilizers (17%) have the highest weight.

The competitiveness of production and the efficiency of export of chemical products are determined by a large number of factors, and their role varies greatly by individual groups of goods. In the production of fertilizers and many inorganic compounds, the availability and cheapness of raw materials is crucial. The production of monomers — the initial products of plastics production is characterized not only by high consumption of oil and gas raw materials and energy, but also by significant capital intensity. The pharmaceutical industry and a number of other branches of "fine" chemistry are characterized by extremely high knowledge intensity. The world commodity markets for plastics and rubber products play an important role in labor costs, although this factor is of little importance in the industry as a whole. For many chemical industries, the environmental factor is of great importance, since they can have a strong negative impact on the environment and human health.



Pic. 1. Commodity structure of the world market of chemical products

A variety of factors ensuring the competitiveness of production determines the participation of a large number of countries in international trade in chemical products not only as buyers, but also as suppliers (Table 1). At the same time, due to the fact that the bulk of the cost is created by several capital- and knowledge-intensive industries (plastics and raw materials for them, "fine" chemistry), leading positions in the world trade in chemicals (in general) are occupied by leading industrial powers. For a long time, only economically developed countries were represented in the top ten largest exporters of chemical products, and only in the mid-2000s did China enter it, which still remains the only developing state there. In imports, the positions of developing countries are more noticeable, but even there, only China falls into the top ten of them.

Germany and the USA have been replacing each other in the role of the main exporter of chemical products for more than two decades, in recent years Germany usually has a slight advantage. China rose to the third place in the early 2020s, ahead of such a traditional specialized exporter as Belgium. The leading exporters of chemical products also include:

- in Europe — France, Netherlands, Great Britain, Switzerland, Ireland, Italy;
- in the Asia—Pacific region - Japan, the Republic of Korea, Singapore.

The United States has remained the largest buyer of chemical goods for many years. During the last crisis, China has significantly approached them, in 2020 ahead of Germany, which traditionally took second place. Belgium and France complete the top five, having a significant gap both from the top three and from the rest of the countries.

The main importers of chemical products also include:

- in the CIS — Russia;
- in Europe — Great Britain, Italy, the Netherlands, Spain, Switzerland;
- in the Asia—Pacific region - Japan, Republic of Korea, India;
- in North America — Canada, Mexico;

• In Latin America — Brazil.

Table 1.

The leading countries in the trade of chemical products in 2021, billion dollars.

Export		Import	
Germany	245	USA	250
USA	240	China	204
China	178	Germany	173
Belgium	143	Belgium	112
France	118	France	109
Netherland	114	Great Britain	86
Japan	104	Japan	85
Great Britain	89	Italy	82
Switzerland	88	Netherland	79
Republic of Korea	76	Canada	59

The countries of Europe, North America, Africa, South and Central America are increasing the volume of exports, as well as imports, thus carrying out close cooperation with other countries in the field of trade in chemical products.

Separately, it should be said about the CIS countries and the Middle East, since they are gradually increasing their production capacity, thanks to which they increase the share of exports and reduce the share of imports, since they have the ability to partially support their needs at the expense of their own production, the rest falls on imported products.

Europe provides about 1/4 of the world's chemical products, especially important here are the production of "fine" chemicals (pharmaceuticals, perfumes, photographic products, etc.), household chemicals and polymers. North America (USA and Canada) also produce 1/4 of the world's chemical industry products. There are especially many gas chemical industries and enterprises producing agrochemicals here. About 1/10 of chemical products are produced by Japan. The CIS countries account for about 1/6 of production, chemical complexes of Russia and Ukraine are particularly distinguished here.

The corporation owns 353 storage facilities for petroleum products with a total capacity of 18.8 million cubic meters. The Chinese authorities approved the merger of two of the country's largest chemical companies - Sinochem Group Co. and China National Chemical Corp. (ChemChina), hoping to create a leading global player in this field. Sinochem and ChemChina will merge into one holding company, which will be financed and controlled by the state.

The deal, which has been planned for several years, should minimize competition between the two companies and create the world's largest chemical conglomerate with annual revenue of 1 trillion yuan ($153 billion). Sales volume for 2020 is $407.0 billion.

According to international experts, the annual rate of development of the global chemical industry is expected to be 3.1%, including in developing countries this figure will be 5.5%, in the EU — 2%.

According to the forecast of CEFIC experts, by 2030 the global production of chemical and petrochemical products will almost double compared to the level of 2014 and will amount to 6.25 trillion. euro. At the same time, the share of Chinese products will rise to 44%.

AO Uzkimesanoat is an integral corporate structure representing the chemical industry of the Republic of Uzbekistan. The structure of AO "Uzkimesanoat" includes 9 large industrial

enterprises. By the end of 2020, the production of marketable products amounted to 7.3 trillion. sum, the growth rate by 2019 is 108.2%.

Table 2.

The main financial and economic indicators for 2021for industrial enterprises of Uzkimesanoat JSC

№	Name of indicators	Ед.изм.	Fact for 2020	Forecast for 2022	Growth rate by 2020, %
1	The volume of commercial products	Billion sum	7 305,6	9 969,8	126,9
2	Production of mineral fertilizers (in 100% p.v.), total	thousands of tons	1 180,8	1 454,8	123,2
	Including:				
	Nitrogen fertilizers	thousands of tons	859,2	1 105,4	128,7
	Phosphorus fertilizers	thousands of tons	111,6	133,4	119,5
	Potash fertilizers	thousands of tons	210,0	216,0	102,9
3	Net profit	Billion sum	436,2	808,2	185,3

Neighboring countries (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan), whose potential is up to 450 thousand tons per year of mineral fertilizers, and neighboring countries (Afghanistan, Iran, Turkey) – more than 100 thousand tons, remain strategic and economically profitable for the export of mineral fertilizers.

By the end of 2020, the following indicators were achieved in the industry as a whole:

- - the forecast for the production of marketable products was fulfilled by 94%;
- the production growth rate was – 108.2%;
- - the export forecast was fulfilled by 67.7%;
- - according to the Investment program, the development was 102.0%;
--fulfillment of the forecast for the production of mineral fertilizers amounted to 91.1%.

Table 3.

Summary target parameters for reducing production costs and reducing the cost of production in the context of industrial enterprises of AO "Uzkimesanoat" for 2021

№	Company name	Unit of measurement	Decline forecast	Including:								
				Production costs						Indirect costs		
				Overall	Of these:					overall	Of these:	
					Saving energy resources	Optimization of raw materials and materials costs	Reduction of technological and other losses	Optimization of numbers-news of industrial and produc	Reduction of other production costs and operating costs		Reducing the cost of maintaining AU	Reducing overhead costs

								tion personnel			P	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
JSC «Uzkimyosanoat» including:		%	4,1	3,9	3,4	0,4	0	0,03	0,2	0,2	0	0,2
		mln.sum	380 185	364 235	313 272	33 969	0	2 386	14 609	15 950	0	15 950
1	JSC «Navoiazot»	%	7,2	7,2	7,2					0,03		0,03
		mln.sum	309 078	307 704	307 704					1 374		1 374
2	JSC «Maksam-chirchiq»	%	0,6	0,6	0,2	0,1		0,1	0,1			
		mln.sum	10 125	10 125	3 981	1 382		2 386	2 376			
3	JSC «Ferganaazot»	%	1,8	0,8		0,7			0,1	1,0		1,0
		mln.sum	24 907	10 996		9 075			1 921	13 911		13 911
4	JSC «Ammofos-Maksam»	%	2,7	2,7	0,2	2,5				0,1		0,1
		mln.sum	25 365	24 798	1 411	23 387				567,3		567
5	JSC «Dehkanabad Potash plant»	%	1,1	1,0	0,01				1,0	0,02		0,02
		mln.sum	5 429	5 331	70				5 261	98		98
6	LLC "Kungrad soda plant"	%	1,4	1,4	0,03	0,03			1,4			
		mln.sum	5 281	5 281	105	126			5 050,0			

DISCUSSION

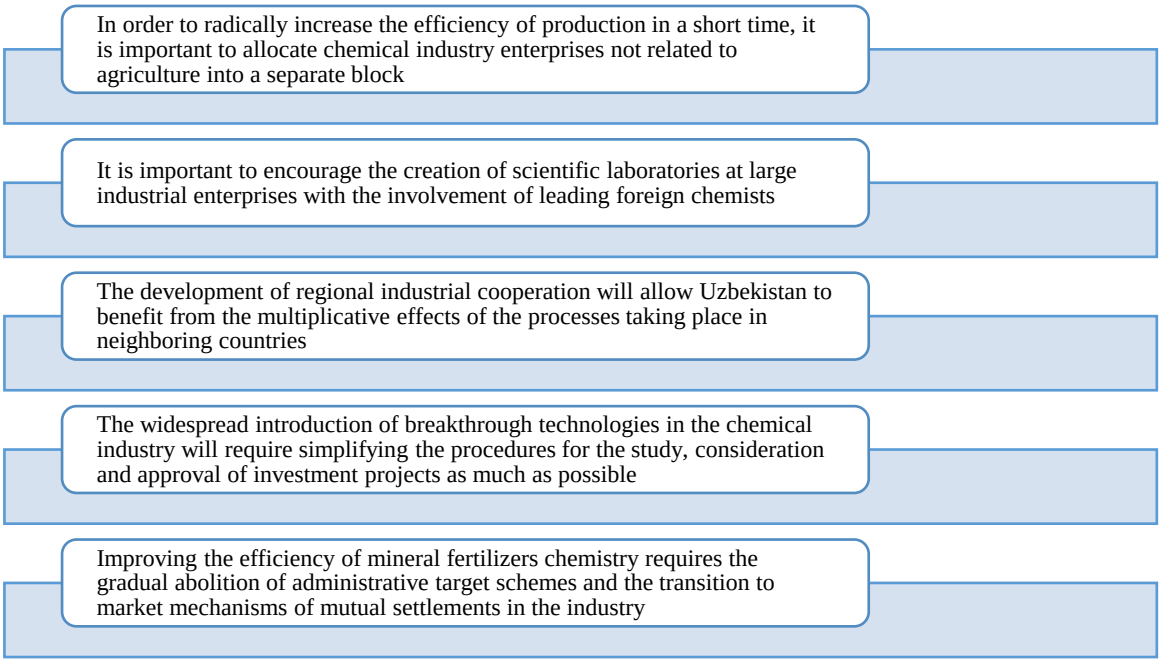
The main reasons for non-fulfillment of the forecast production parameters for nitrogen and phosphorus fertilizers are: restrictions in the provision of natural gas in the autumn-winter period (January-February, November-December); shortage of phosphorous raw materials at JSC “Ammophos-Maxam” due to a shortage of financial resources due to late purchase of finished products by agricultural producers.

CONCLUSION

The Government's strategy for chemicals and petrochemicals, which is currently being developed, provides for large-scale investments in this sector. However, exploration and production at the top of the value chain in certain areas are still considered strategically important and may remain under state control. This applies to all large-scale projects in the strategic sectors of cotton and grain production and fertilizers. According to the forecasts of

Uzkimesanoat, they should remain in full state ownership, but it is possible to consider organizing the production of final goods together with private investors. Meanwhile, Uzbekneftegaz has shown a clear interest in a large share of investments in the share capital of gas processing enterprises and subsequent production cycles in petrochemicals and polymers. Since these two enterprises use the same natural resources, have products that are transferred through their value chains, and the government controls the supply of raw materials, energy supply and, to some extent, the sale of products, proper coordination is justified, provided the sector develops.

Over the past 5-10 years, Uzbekistan has managed to significantly increase its advantage over neighboring countries in a number of different types of chemical products. For example, already in 2006, the Kungrad soda plant was put into operation, producing 100 thousand tons of soda ash per year. There are no similar production facilities in Central Asia, the creation of such production facilities in Kazakhstan and Turkmenistan is only being worked out. In 2009, Uzbekistan launched a project for the production of synthetic liquid fuel based on purified methane from the Shurtan GHK. The implementation of a similar project in Turkmenistan (a plant for the production of gasoline from natural gas) was launched only in 2014. The construction of the Ustyurt Gas Chemical Complex on the basis of the Surgil deposit was completed in 2015, in Turkmenistan the construction of a gas chemical complex was only started in 2014 in Kiyanly; in Kazakhstan, a similar project is only being worked out in the Atyrau region. In other words, Uzbekistan launches almost all key projects in the chemical industry before other Central Asian countries, after that similar productions begin to be worked out and implemented in neighboring countries.



Pic.2. The main prospects for development in the chemical industry

For example, if Uzbekistan does not launch production using methanol-olefin technology in the next 4-5 years, other countries in the region may establish this production earlier than Uzbekistan (at the current level of technology development, individual countries in the region can implement this project in 5-8 years). The country that introduces the technology first will have access to the production of the entire line of polymer products and will occupy the Central

Asian market in this segment. After that, it will be extremely difficult for Uzbekistan to attract foreign investment and join the global technological chains for the production of these products.

REFERENCES

1. Dulman A.D. Chemical industry in Uzbekistan.-Tashkent, 1959; Its non-economic effectiveness of the development and placement of the chemical industry in the Bukhara-Navoi industrial district.-Tashkent, 1971
2. Askerov Sh.M. From the experience of socio-economic problems at chemical industry enterprises in the 80s. The historical and party aspect of the problem (based on the materials of the republics of Central Asia).: Diss. Candidate of Sciences.-M. , 1991. Khodjaeva Muir. Development of chemical science and chemical industry in Uzbekistan (1917-1945).-Tashkent, 1991.
3. Popov B.G. Chemical hazard risk assessment// Chemical industry -2001. No.7. pp.41-42.
4. Shubin V.S. Applied reliability of chemical equipment: Textbook. --Kaluga: Publishing House of Nu Bochkareva, 2002. 296 p.Fozilova F.K .Ways of development of the chemical industry and its export of South Korea. -Asian journal of research in business economics and management, ISSN: 2249-7307, Vol.12, Issue 4, April 2022
5. Fozilova F.K., Development of foreign economic activity and dynamics of exports in the Republic of Uzbekistan for 2018-2020 years, MODERN SCIENTIFIC CHALLENGES AND TRENDS: a collection scientific works of the International scientific conference (7-9 April, 2021) - Warsaw: Sp. z o. o. "iScience", 2021. Part 2 – 230 p., https://sciencecentrum.pl/konferentsii/
6. Nazarova R., Fozilova F.K. Foreign trade of industry in developed and developing countries, "*Economics and Innovative Technologies"*: Tashkent/ Vol.2020: No.4, Article 1. Available at: https://uzjournals.edu.uz/iqtisodiyot/vol2020/iss4/1
7. Fozilova F.K., Digitalization and its impact on the development of international trade, VI International Scientific and practical conference SCIENTIFIC HORIZON IN THE CONTEXT OF SOCIAL CRISES, held on February 6-8, 2021 in Tokyo, Japan, https://ojs.ukrlogos.in.ua/index.php/interconf/article/view/8534
8. https://cefic.org/a-pillar-of-the-european-economy/facts-and-figures-of-the-european-chemical-industry/growth-and-competitiveness/
9. https://economy.gov.ru/material/news/zapusk_rossiysko_koreyskogo_industrialnogo_kompleksa_v_primore_pozvolit_sozdat_okolo_2_tysyach_rabochih_mest.html?utm_source=yxnews&utm_medium=desktop
10. https://elaw.klri.re.kr/eng_service/lawView.do?hseq=4764&lang=ENG
11. https://poisknews.ru/themes/himiya/bez-himii-ne-zhizn-uchenye-znayut-kak-podtyanut-otstayushhuyu-otrasl/