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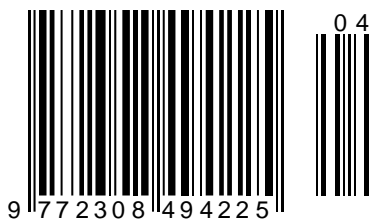
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SCENARIOS OF INVESTMENT AND INNOVATION POLICY IN THE LIGHT OF INSTITUTIONAL TRANSFORMATION

Abstract: *Subject. The article is devoted to the problems of developing scenarios for the strategy of investment and innovation policy of the state in the conditions of transformation. Goals. Clarification of the definition of the category of investment policy of the state. Development of investment and innovation policy scenarios for the conditions of the Republic of Uzbekistan. Methodology. In the course of the study, such methods of analysis as systematization and generalization were used. Results. Clarifications and the author's interpretation of the economic category "investment policy" are given, trends in the development of the world economy are analyzed, as well as some macroeconomic indicators of the development of the economy of Uzbekistan. Scenarios of investment and innovation policy in relation to the local conditions of the Republic of Uzbekistan are proposed. Conclusions. It is concluded that the objectives of investment policy and innovation strategy are closely interrelated. In conditions of instability of business and investment activity in the world, in order to maintain high rates of economic development of the country, it is necessary to pay more attention to internal growth reserves.*

Key words: *investments, innovations, innovation and investment policy, institutional reforms, strategy, Economy of Uzbekistan.*

Language: *English*

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Introduction

JEL Classification: O31, P48, R11, R58

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One of the vectors of the country's economic development within the framework of the implementation of the Development Strategy of the new Uzbekistan for 2022-2026 is considered to be high investment activity, which contributes to economic growth and, as a result, is a catalyst for the growth of the welfare of society. This is reflected in the formation of an effective strategy for investment and innovative development of territories. Increasing the volume of investments and improving the efficiency of innovation management are fundamental conditions for the diversification of the national economy, creating prerequisites for economic growth. The optimal use of investments at both the micro and macro levels depends on the country's production potential and its efficiency.

In conditions of uncertainty, the issues of attracting investments to various sectors of the economy are particularly acute, since the investment process is directly related to economic growth, the increase of which depends on the concentration of domestic investment potential and on the possibilities of attracting foreign investors. Project management is becoming a new developing area of knowledge and practice, which is associated with the identification and assessment of investment risks that affect the decline in investment activity and the effectiveness of economic activities of organizations.

Literature review

The discussion of options for developing an investment policy strategy and the resulting options for economic development strategies occupies a significant place in scientific discussions. Thus, the foundations of the theory of economic systems and effective reproduction of social capital were laid in the works of J.K. Galbraith, J.M. Keynes, V.V. Leontiev, D. North, V. Pareto, P. Samuelson, J.Y. Stiglitz, J. Tinbergen, F. Hayek, J. Schumpeter, etc. Issues of strategic management and modeling of investment policy in an innovative economy were dealt with by I. Ansoff, A.A. Vodianov, S.Gulyamov, M.A. Ikramov, A.Y. Malenkov, G. Minsberg, G.A. Parsadanov, I.V. Prangishvili, A.N. Falomyev, L.I. Yakobson, etc.

Having conducted a systematic monitoring of scientific sources[1] in the field of investment policy, we came to the conclusion that the investment policy of the state is a concept of organizing and managing investment activities in the country in order to ensure the achievement of socio-economic development goals. Accordingly, the goals of investment policy depend on what results of the development of socio-economic processes in the country the state wants to achieve.

The main priorities of the investment policy, its content and key points, in turn, proceed from the priorities of the socio-economic policy of the state. At the same time, the need for awareness of the need for spatial balance of policy remains unchanged: investment policy, as well as socio-economic policy, is formed at the expense of the state, but its implementation takes place at the level of territories and industries.

The currently existing developments on the formation of investment policy use a variety of fairly effective research methods, techniques and approaches. However, the importance of increasing attention to the formation of conditions for an innovative economy in the country, as well as the tightening of competitiveness issues, necessitate the development of investment policy based on new methodological tools.

Research Methodology

The methodological basis of the research is a process approach. The study takes into account systemic, integration, situational, institutional approaches, which is due to the complexity and multidimensional nature of the scientific problem of developing and implementing an investment strategy. Methods of systems theory, general and strategic management, stakeholder theory, etc. were applied.

The theoretical basis of the study was the scientific provisions contained in the fundamental works of domestic and foreign scientists.

The information and empirical base of the study was made up of international documents of the United Nations, the World Bank, the Interstate Statistical Committee of the CIS, the State Statistics Committee of the Republic of Uzbekistan, as well as factual and empirical materials presented in scientific and practical publications.

Analysis and results

Currently, the main global problem of the global economy appears to be the development of an adequate strategy for overcoming the financial and economic crisis, which our country is trying to solve using classical monetarist methods — priority attention is paid to regulating the volume of money supply, reducing inflation and supporting financial institutions.

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Ашурков, О. А., & Орлова, Н. А. (2020). Особенности формирования системы правового регулирования инвестиционной деятельности. *Вестник Института экономических исследований*, (2 (18)), 112-121.

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Толмачева, А. Э. (2019). Проблемы привлечения иностранных инвестиций в российскую экономику. *Экономика: вчера, сегодня, завтра*, 9(6-1), 233-239.

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Bachtler, J., Martins, J. O., Wostner, P., & Zuber, P. (2019). *Towards Cohesion Policy 4.0: Structural transformation and inclusive growth*. Routledge.

Grillitsch, M., Hansen, T., Coenen, L., Miörner, J., & Moodysson, J. (2019). Innovation policy for system-wide transformation: The case of strategic innovation programmes (SIPs) in Sweden. *Research Policy*, 48(4), 1048-1061.

Ferraz, J. C., & Coutinho, L. (2019). Investment policies, development finance and economic transformation: Lessons from BNDES. *Structural Change and Economic Dynamics*, 48, 86-102.

Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. *Research Policy*, 48(8), 103773.

Shirov, P. N., & Danilova, V. O. (2020). Priorities of investment policy of the state in the system of ensuring economic security of the real sector of the economy. *St. Petersburg State Polytechnical University Journal. Economics*, 13(1), 55.

As world practice shows, the existing ways out of the crisis can be divided into two groups[2].
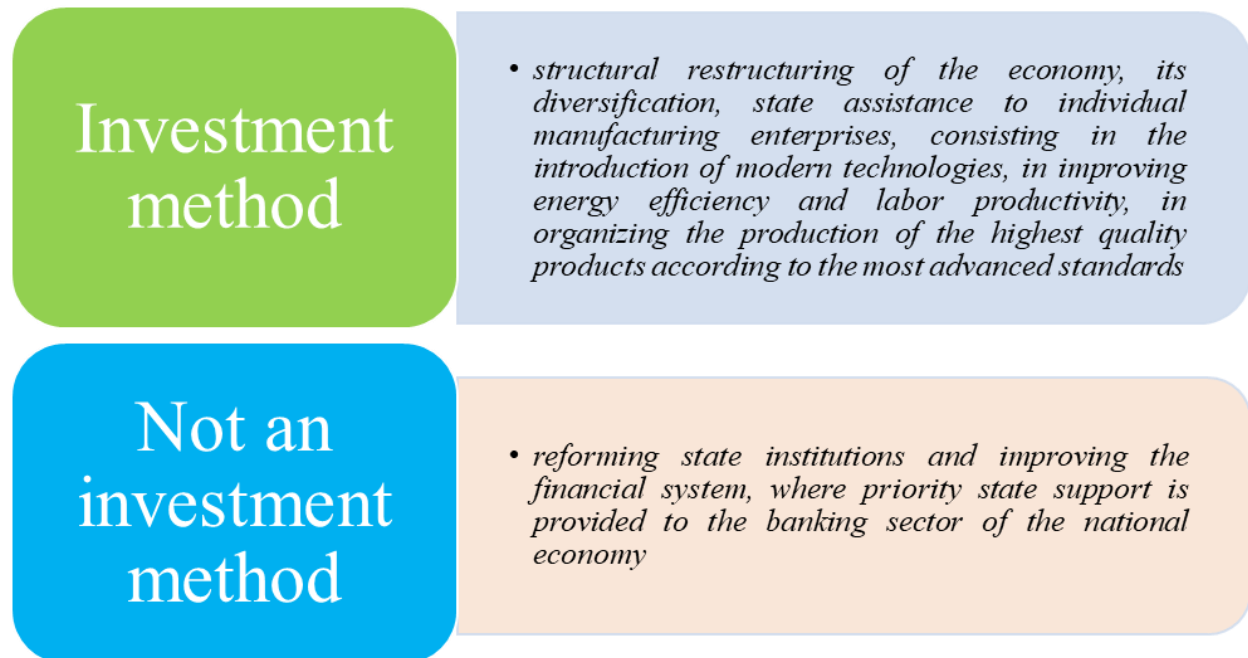

Fig.1. Methods of overcoming the crisis

As can be seen from the presented figure, the investment method looks quite promising. This is explained by the fact that the investment sphere is the link of the economy, the state of which determines the pace of socio-economic development of the state, the technological level and efficiency of production, competitiveness in global markets and thereby the level and quality of life of the population[3]. Investments in the production of consumer goods and services, the construction of housing and socio-cultural facilities directly affect the living conditions of the population. In this connection, it is difficult to overestimate the relevance of economic growth[4].

Following this, we can say that with high-quality economic growth, the renewal of fixed production assets takes place, innovative and high-tech activity increases, working conditions at enterprises improve, wages become a form of a decent standard of living for people. This is inextricably linked with the problem of increasing investment activity and improving the investment climate[5]. The growth of investments and their broad involvement in innovative activities, which adapts the innovations available in world practice and creates new high-tech products, will contribute to the worldwide increase in the competitiveness of the country's economy.

The gradual transition to an innovative economy requires the formation of such a strategy of investment policy of economic growth, which will ensure the transition of the national level of development of production technologies and living standards to a new, higher technical level. It is impossible to make this transition without industrialization and continuous modernization and technical and technological renewal of production.

In our opinion, the country's innovation and investment policy is aimed at improving state regulation, development and stimulation of innovation through investment, structural reforms and improving the standard of living of the population, for sustainable economic development and solving the most

[2] Шпалтаков, В. П. (2018). Проблемы улучшения инвестиционного климата в России. *Вестник Омского университета. Серия «Экономика»*, (1), 56-66.

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important tasks of the socio-economic system of the state.

From the point of view of the conditions for the formation of an innovative economy, it can be noted that there are a number of problems in the processes of attracting and using investments[6].

Production in Europe and Central Asia (ECA) is estimated to have grown by 5.8 percent in 2021, indicating a faster than previously estimated recovery in domestic demand for most of this year. The strengthening of economic activity in the euro area and the increase in commodity prices contributed to the growth of exports and the influx of remittances, providing additional support to the recovery processes in the region. The incoming data showed more confident dynamics and contributed to the upward revision of estimates of economic growth rates for 2021 in about 90 percent of the ECA countries.

At the same time, global growth is expected to slow to 4.1 percent in 2022, reflecting the ongoing outbreaks of COVID-19, a reduction in fiscal support and continuing supply bottlenecks. Production and investment in advanced economies are projected to return to pre-pandemic levels next year, but they will remain noticeably lower in emerging market and developing countries (EMDC). Downside risks to the global outlook include a synchronous resumption of the pandemic, further supply disruptions, destabilization of inflation expectations, unexpected financial stress and possible climate disasters[7]. The decision-making bodies of the SFRS countries face problems of increased inflationary pressure and limited budgetary opportunities. In the long term, EMDC countries will need to implement reforms aimed at reducing vulnerability to commodity-related shocks, reducing inequality and increasing crisis preparedness.

By 2023, production in all EMDC regions is expected to remain below pre-pandemic levels, unlike in advanced economies, where the gap is projected to narrow. The region of Europe and Central Asia will be closest to the trajectory that existed before the pandemic, and South Asia will be the furthest from it. Risks that may cause regional forecasts to be revised downwards include ongoing COVID-19 outbreaks, slow progress in vaccination, financial stress, lower-than-expected commodity prices, geopolitical tensions and social unrest, food insecurity, as well as disruptions and damage from extreme weather conditions[8].

East Asia and the Pacific region. According to forecasts, the growth rate in the region will slow down to 5.1% in 2022, and then in 2023 it will slightly increase to 5.2%.

Europe and Central Asia. The growth rate is projected to slow down to 3.0% in 2022 and to 2.9% in 2023.

Latin America and the Caribbean. According to forecasts, the growth rate will slow down to 2.6% in 2022, and then slightly increase to 2.7% in 2023.

Middle East and North Africa. It is predicted that in 2022 the growth rate will increase to 4.4%, after which it will fall to 3.4% in 2023.

South Asia. Growth is projected to increase to 7.6% in 2022, and then slow down to 6.0% in 2023.

Sub-Saharan Africa. It is predicted that in 2022 the growth rate will slightly increase, amounting to 3.6%, and will continue to increase in 2023, reaching 3.8%[9].

Let's consider the situation in relation to the national economy of Uzbekistan.

Competition is still perceived as weak. According to the Bertelsmann Transformation Index, the perception of market competition in Uzbekistan improved from 2016 to 2020, but today it still lags behind a number of other countries in the Europe and Central Asia region, such as Tajikistan, Ukraine, Poland and Russia.

Entrepreneurship remains limited. The density of entry of new firms into the formal private sector — a standard indicator of entrepreneurship - has improved over the past few years, but remains significantly below the regional average and lower than projected per capita income in Uzbekistan.

Formal private firms do not increase in size as they age. The analysis, based on data from the World Bank's enterprise surveys for 2019, shows that formal private firms, especially in manufacturing and services, did not grow as fast as in other large transition economies, such as Vietnam and Russia. In addition, these firms tend to remain small over time: official private Uzbek firms employ an average of 20 employees for up to 10 years, compared with 33.6 employees in similar firms in Vietnam. This gap of 13.6 employees becomes larger (up to 78.6 employees) for firms that are more than 20 years old.

Reduced labor productivity. The same micro-level analysis showed that labor productivity (defined as sales revenue per employee) in the formal private sector has been steadily declining over the past decade, with annual growth of -1.2 percent in 2010-2013 and -6.7 percent in 2016-2021. This recent decline indicates poor performance in other areas of entrepreneurship, such as insufficient openness of

[6] Гуляева, Г. Г. (2015). Сущность инновационно-инвестиционной политики. *Современные научные исследования и инновации*, (9-1), 189-192.
[7] Kathuria, S., Yatawara, R. A., & Zhu, X. O. (2021). Spotlight on Outward Foreign Investment and Foreign Direct Investment Policies.

[8] Qiang, C. Z., Liu, Y., & Steenbergen, V. (2021). *An Investment Perspective on Global Value Chains*. World Bank Publications.
[9] https://www.vsemirnyjbank.org/ru/publication/global-economic-prospects

trade, low innovation intensity and weak capabilities of companies.

All this points to a common interpretation: stagnation in the private sector reflects a distorted business environment that does not reward firms with growth potential and prevents the allocation of resources in favor of more efficient firms.

There are many reasons for this. One of the important factors is limited competition in commodity markets, a typical problem for countries with economies in transition. Indeed, discriminatory interference and regulation continue to make the playing field unequal, especially in markets where State-owned enterprises compete with private firms.

Moreover, there are other reasons such as barriers in the business environment that hinder the development of the private sector, including tax rates, informal sector practices and access to electricity and finance.
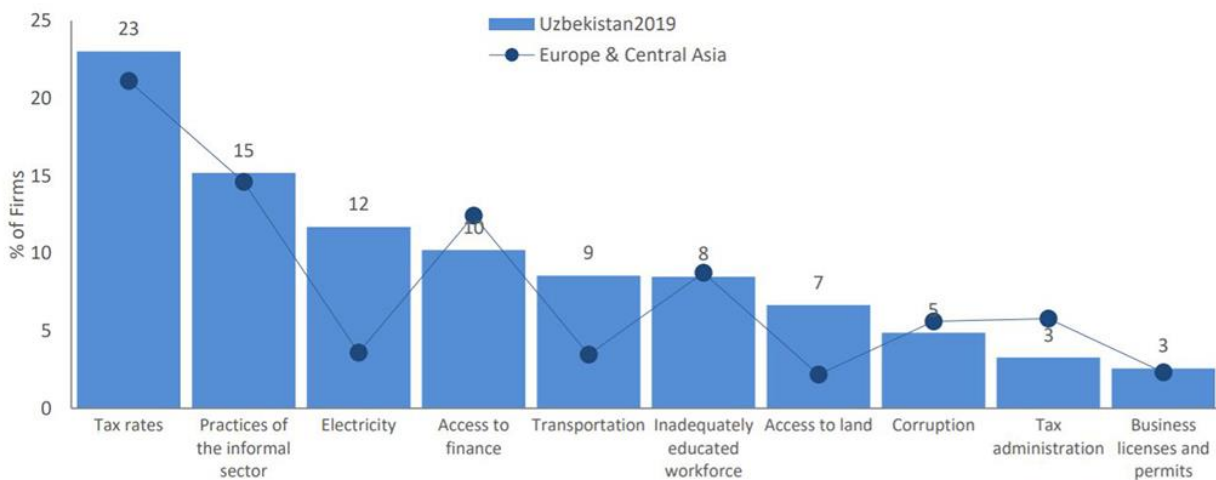

Fig.2. Typical problems of the business sector

These data confirm the need for a comprehensive policy program to optimize the business environment and stimulate the development of the private sector in Uzbekistan. Seven urgent reforms and policies to focus on:

Active development of competition. Creating favorable conditions for private firms to compete is just as important as promoting privatization and restructuring of state-owned enterprises. Therefore, it is crucial to continue reducing distorting discriminatory interventions and rules that change the rules of the game, especially in markets where state-owned enterprises compete with private firms. It is necessary to strengthen competitive neutrality, as well as control state aid in order to avoid favoritism and minimize distortion of competition.

Ensuring that the fiscal system supports the growth of the firm. The fiscal system should stimulate the growth of companies by balancing tax rates and administrative burden. The fiscal system should raise rates gradually as firms increase in size, so as not to hinder growth, and lower marginal rates to stimulate investment and employment in growing and large companies.

Mitigation of informal sector practices. In order to limit the size of the informal sector and redirect resources in favor of the most efficient firms, public policy should: increase the flexibility of the labor market, reform the social protection system, rationalize the tax system and improve the regulatory framework and the justice system. In addition, there must be conditions for creating good formal jobs so that the informal sector regresses over time.

Improving access to finance for micro, small and medium-sized enterprises. This can be achieved by developing competition in the banking sector, reducing state ownership of commercial banks, further reducing targeted government lending, improving bank management and increasing human capital in the banking system. And continuing to strengthen institutions to ensure rapid credit growth and ensure the allocation of financial resources for the most productive projects.

Promotion of electric power sector reforms. This is critically important for updating outdated infrastructure and improving the quality and reliability of service. The Government of Uzbekistan is implementing appropriate sectoral reforms to transition to market mechanisms that increase efficiency and update outdated infrastructure. It is also important to ensure effective regulation of competition and pricing.

Implementation of an active entrepreneurship support policy. When implementing the above-mentioned reforms, it is crucial to pursue an active policy aimed at eliminating existing shortcomings that hinder the growth of entrepreneurship. Business support measures should follow two important principles. First, prioritize the growth potential and productivity of firms rather than their survival. Secondly, to combine financial and non-financial tools to strengthen the capabilities of firms so that firms can manage production, learn new opportunities in the market, take on the risk of developing new projects, introduce new technologies and expand activities.

Addressing skills gaps to ensure private sector growth. Before the crisis caused by COVID-19, many enterprises reported a lack of skills as a serious deterrent to business development in Uzbekistan. It is estimated that the pandemic has resulted in learning losses equivalent to two years of schooling for children, which affects the potential productivity of the future workforce. Thus, the development of skills in education is an area that requires urgent action.

Uzbekistan faces a difficult task of developing the private sector while abandoning the legacy of a centrally planned economy. Making private firms the backbone of the country's business and economic future is the only sustainable way forward. This will require the coordination of all stakeholders and government agencies, the achievement of a broad consensus and the creation of a reliable framework for monitoring the coordination and implementation of reforms.

Unlocking the full potential of the private sector and entrepreneurship is crucial for Uzbekistan to achieve the 2030 Development Goals and improve the lives of the entire population.

According to World Bank research, investment inflows in Uzbekistan decreased by 26 percent to $1.7 billion, despite a relatively good macroeconomic situation in which GDP increased by 1.6 percent in 2020, as well as the country's efforts to attract new FDI. The Law on Special Economic Zones (SEZ), adopted in February 2020, for example, promoted new investment projects in the energy sector, as well as in the telecommunications industry. Currently, 22 SEZs are registered and operating in the country . In May 2020, the government announced that 70 companies and consortia from 30 countries had submitted proposals for green energy projects.

In addition, Volkswagen Group (Germany) has launched an investment project in the FEZ from Jizzakh. However, since the country is doubly landlocked, that is, surrounded only by other landlocked countries, border closures and other restrictive measures taken by local authorities and authorities of neighboring countries have affected the economy and delayed investment projects.

Since April 10, 2021, Uzbekistan has been accepted as a beneficiary country under the GSP General Scheme of Preferences.

As a member of the GSP+ system Uzbekistan receives additional economic benefits compared to the standard GSP due to the complete abolition of tariffs on two-thirds of the product lines covered by the GSP, which, in turn, will contribute to export growth and attract additional investment to the country. GSP+'s commitments in the field of sustainable development further strengthen Uzbekistan's position as a reliable and far-sighted economic partner.

The level of use of preferences under the GSP in Uzbekistan currently stands at 87%. The product segments that most benefit from reduced benefits are textiles and clothing, plastic products, as well as fruits, nuts and vegetables, which indicates that Uzbekistan's export structure is already more diverse compared to its neighbors from Central Asia.

The GSP+ scheme offers additional opportunities to increase trade between the EU and Uzbekistan, as tariffs on a number of important export goods, such as fabrics, clothing and plastic products, will be abolished. Despite its relative proximity to the EU market, the trade potential has not yet been fully utilized, since the EU ranks only seventh in the list of export destinations of Uzbekistan.

A comprehensive analysis of the data of the State Statistics Committee of the Republic of Uzbekistan, the Report of The World Bank: Foreign Direct Investment can reveal the following.

Uzbekistan ranks 103rd out of 201 possible in the latest World Bank: Foreign Direct Investment 2019 ranking.

Firstly, the volume of investments per capita remains at a fairly low level - 20% of the world average and ¼ of the average level of the CIS countries.

Secondly, for various reasons, the investment activity of enterprises, the main driver of investment activity, has been declining in recent years - the share of enterprises' funds as a source of investment financing decreased from 32.0% in 2015 to 29.1% in 2021, and the volume of investments at the expense of enterprises increased by only 26.3% compared to 2015.%.

Thirdly, despite the efforts being made, the volume of attracting foreign direct investment (FDI) remains low - 3.6% of GDP by the end of 2018, and 4.1% in 2021, while the optimal level of FDI is 7-10% of GDP, or $77. At the same time, FDI is one of the key sources of new technologies and experience, and not only a source of additional funds. Their lack is a serious limitation for the successful formation of an innovative economy. At the same time, a significant part of foreign direct investment in fixed capital by the end of 2021 of 61.9 % are in four countries-investors: Russia– 24,2 %, China – 20,4 %, Turkey – 9.2% and Germany to 8.1 %. This indicates a serious

dependence of foreign capital flows from only 2 countries of the world.

In January-December 2021, 245.0 trillion soums were spent on the development of the economy and social sphere of the Republic of Uzbekistan at the expense of all sources of financing. sum of investments in fixed assets. In dollar terms, they amounted to $23.1 billion, and the growth rate by 2020 is fixed at the level of 105.2% (Fig.3).

Investments in fixed assets by sources of financing
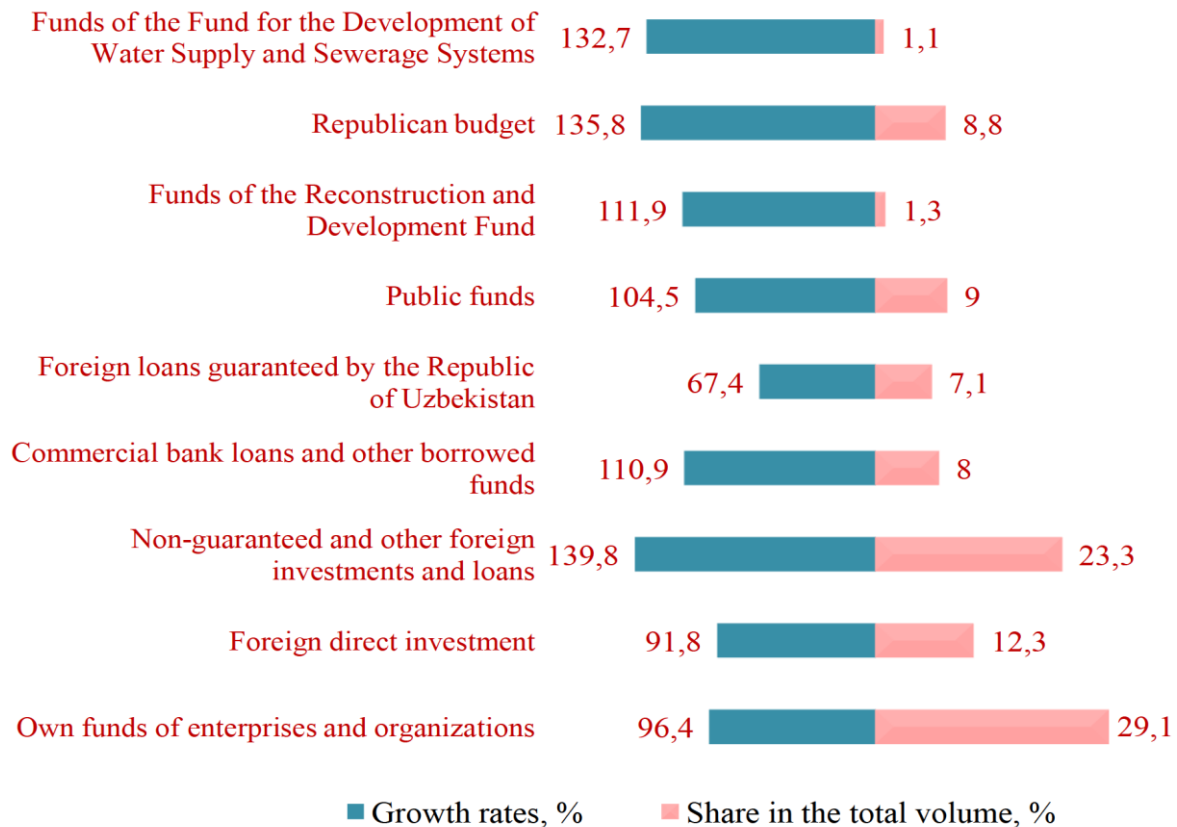
Fig. 3. Investments in fixed assets by sources of financing.

In recent years, measures have been taken to create a large-scale favorable investment climate in the republic, attract and develop foreign investment, in particular foreign direct investment. Thus, as a result of investments made directly at the expense of foreign direct investment, 30,149.2 billion soums were disbursed sum, which, compared with 2020, is 1.8 percentage points less, or 12.3% of their total volume (Fig.3).

The highest indicators and growth rates in terms of sources of financing of investments in fixed assets were noted due to non-guaranteed and other foreign investments and credit funds, which, compared to 2020, increased by 39.8%. 56 989.9 billion. soums of investments in fixed assets was mastered at the expense of non-guaranteed and other foreign investments and loans, and their share amounted to 23.3% and increased by 5.8 percentage points compared to 2020.

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Structure of investments in fixed assets by sources of financing, billion soums

Non-guaranteed and other foreign investments and loans 56 989,9

Foreign direct investment 30 149,2

Commercial bank loans and other borrowed funds 19 545,4

Foreign loans guaranteed by the Republic of Uzbekistan 17 318,2

Fund for the Development of Water Supply and Sewerage Systems 2 860,8

Republican budget 21 498,2

Enterprise funds 71 257,3

Public funds 22 229,2

Reconstruction and Development Fund 31 14,4

Fig.4. Structure of investments in fixed assets by sources of financing, billion soums.

In January-December 2021, the volume of disbursed foreign investments and loans to fixed assets reached 104,457.3 billion. sum (in the dollar equivalent of $9.8 billion), or 105.2% by 2020 (Figure 5). The share of foreign investments and loans to fixed assets in the total volume of disbursed investments in January-December 2021 was 42.7%.

Foreign investments and loans to fixed assets, billion soums

	Total	including:		
		foreign direct investment	*foreign loans guaranteed by the Rep.of Uzb.*	*other foreign investments and loans*
Republic of Uzbekistan	**104 457,3**	**30 149,2**	**17 318,2**	**56 989,9**

Fig.5. Foreign investments and loans to fixed assets, billion soums.

In the total structure of foreign investments and loans, foreign investments reached 39 879.4 billion. sum and, respectively, 64 577.9 billion. sums are accounted for by foreign loans.

Fourth, the main volume of investments is directed to the development of the manufacturing industry. The industry has mastered a significant amount of foreign investments and loans, which amounted to 39,213.1 billion. sum, or 37.5% of their total volume.

At the same time, about 6% is directed to more important industries from the point of view of the formation of an innovative economy -electrical engineering and mechanical engineering, as well as science and education. A similar situation is observed in the structure of the distribution of foreign investments.

As for the actual investment in innovation, the total amount of costs for all types of innovations (technological, marketing and organizational) has decreased approximately, and their dynamics are volatile.

There is still an imbalance in the structure of costs by type of innovation - technological innovations occupy the largest share (74.8% in 2018), almost equally process and product. The prevalence of costs for technological innovations, without the development of marketing and organizational ones, although it contributes to the growth of enterprises in the short and medium term.

Based on these problems, taking into account the set goal of the investment policy, three scenarios of the strategy can be considered:

I. the script. Identification of priority sectors of the economy and worldwide state support for their development. The basis for choosing priority industries can be an analysis of available resources and the potential for the development of industries, identifying gaps in the value chain and directing investments to "close" the gap in the chains.

At the same time, 2 stages can be distinguished here:

▪ the first 5-10 years - creation of national value chains and national brands;

▪ the next 10-15 years - the integration of Uzbek enterprises into international value chains.

II. scenario. Development based on the theory of the stages of development of the economy of the World Economic Forum - from the resource economy to the economy based on the growth of productivity of factors of production and further to the economy based on innovation.

III. the script. Active formation of clusters in strategic areas of the economy and, accordingly, the direction of investments to stimulate and develop this process. In some respects, this approach echoes the first two. However, unlike the first option, it is proposed to focus not on a single industry, but on their complex. Accordingly, unlike the second option, it is supposed to focus on investing in personnel training

and infrastructure not in the economy as a whole, but within a separate set of industries.

Each of these strategy scenarios is acceptable from the point of view of achieving the ultimate goal - the formation of an innovative economy. However, the most relevant is still the combination of the considered scenarios, depending on the characteristics of industries and regions, as well as the current situation.

Conclusion/Recommendations

The development of investment institutions, strengthening the market infrastructure, increasing the level of financial literacy of the population, ensuring the transparency of the activities of joint-stock companies, strengthening the protection of shareholders' rights will ensure an increase in the participation of foreign capital and the population in the stock trading market of domestic enterprises.

In general, summarizing the above, it can be noted that the strategy of economic development, first of all, investment potential, for the long term, is necessary in order to purposefully regulate the investment field and flows.

The priority direction of the investment policy is to increase the volume of foreign direct investment inflows. The instability of the regulatory environment and the lack of transparency of business conditions, the continuing problems with the stability and development of infrastructure, the protection of the rights of investors and owners significantly limit the inflow of foreign direct investment in these conditions, along with the solution of these problems, there will be the introduction of mechanisms for the targeted attraction of foreign capital through special incentive measures, the establishment of cooperation between the business circles of the republic and foreign countries, as well as attracting foreign investors to acquire state assets, including in the banking sector.

In conditions of instability of business and investment activity in the world, in order to maintain high rates of economic development of the country, it is necessary to pay more attention to internal growth reserves. The emphasis on the expansion of domestic demand, a comprehensive increase in the level of savings by accumulating free funds of the state, enterprises, and the population for investment purposes will keep the process of expanded reproduction at a sufficiently high level.

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AN ANALYIS ON THE ADDED-VALUE AND BUSINESS DEVELOPMENT OF ANALOG RICE MADE FROM SAGO (A CASE STUDY OF TIGA PUTRISELAT PANJANG MSME IN KEPULAUAN MERANTI REGENCY)

Abstract: Analog rice is a processed food product resembling rice made from non-rice carbohydrate sources, like starch of tubers, corn, and sago. Analog rice contains a lower glycemic index making it more superior than rice. This product, analog rice, can help diversify the food consumption patterns of the Indonesian citizen to improve the nutritional quality of the food consumed. It will further improve the nutritional status of the population. In addition, It will help to reduce people's dependence on rice. This dependence leads to a national problem since rice is still imported. Therefore, to deal with the problem, we require an alternative food (analog rice) resembling rice with high nutrient content. Analog rice has easy-to-obtain raw materials (sago and taro) in which they are available throughout the years. Therefore, it possesses considerable potential to be developed. Finally, a technological innovation research is needed to determine the added value of each of these raw materials to produce analog rice and how to develop the business partners of this research (MSMEs "TigaPutera"). This study aims at: 1) determining the analysis of added value and business development of analog rice made from sago of to research partners (MSMEs "TigaPuetra") and 2) examining the product's characteristics produced physically or organoleptically. This study is expected to be applied by research partners to increase their business capacity and become a superior product area. Based on the results of this research, it can be concluded that analog rice processing can provide added value in the form of profits for entrepreneurs, remuneration for production factors, and income for workers.
Key words: Analog Rice, Added Value, Business Development.
Language: English

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Introduction
Research Background

Currently, analog rice made from sago is rich in carbohydrates and poor in other nutrients required by the human body. Therefore, this product needs to be fortified with food functional components. Food functional components are food ingredients containing bioactive components providing multifunctional physiological effects for the body. The effects include strengthening the immune system, regulating the rhythm of physical conditions, slowing aging, and helping prevent disease. These bioactive components are compounds possessing certain physiological functions other than basic nutrients.

Fish oil supplements are one of the food functional components needed for the body to function properly. Therefore, supplements cannot be used to substitute drugs and foods completely. It means health food supplements are intended to complement or increase food intake. The results of previous research 1(Sukmiwati et al, 2020) found a nutrient-rich fish supplement is made from catfish oil (omega-9), shark (omega-3) and red palm oil (vitamin A) which are rich-in-nutrient food functional components. Therefore, this follow-up study is designed to create an economic multiplier effect through the development of producing analog rice made from sago to be used as a superior product.

In an effort to develop a reliable agro-industrial system, Riau was selected as a center for freshwater fish production, especially catfish. In addition, Riau is known as a palm oil (CPO) producer. Hence, it is expected that these commodities can be developed to be fortified in nutrient-poor food products, one of which is analog rice made from sago. Considering this potential has been optimally unutilized, this study is designed to create an economic multiplier effect through the development of high-nutrition products as superior products in Riau. The content of essential fatty acids containing fatty acids of omega-3, omega-6 and omega-9 is a food functional component which is potential from fish. The results of previous research carried out by 2Syahrul (2013) concerning the extraction of catfish oil showed that catfish oil was rich in omega-9 fatty acids (23%).

Recently, analog rice has begun being in demand by the public, especially diabetics. It is because the analog rice is believed to be able to maintain optimal and effective health. However, this potential has been unoptimized, especially from the economic aspect. One of the efforts that can be done is to utilize abundant local raw materials into processed products, such as analog rice made from sago, taro and their mixtures. The processing results can have added value, but it is not known exactly how much the added value will be.

At this time, analog rice made from non-rice starch is very much needed by the community to maintain optimal health. However, the product is only affordable for certain groups of people since the price is relatively expensive. This situation has prompted researchers to conduct a study being able to overcome this problem. Analog rice has easy-to-obtain raw materials (sago and taro) in which they are available throughout the years. Therefore, it possesses considerable potential to be developed. Finally, a technological innovation research is needed to determine the added value of each of these raw materials to produce analog rice and how to develop the business partners of this research (MSME "TigaPutera").

This study is carried out to follow up on the findings of prevouise research. This study aims at: 1) determining the analysis of added value and business development of analog rice made from sago of to research partners (MSME "TigaPuetra") and 2) examining the product's characteristics produced physically or organoleptically. This study is expected to be applied by research partners to increase their business capacity and become a superior product area.

In Indonesia, analog rice is a product that is already familiar by certain groups of people, intended to maintain optimal health. Various kinds of analog rice products on the market are analog rice made from corn, sweet potatoes and sago. Generally, analog rice is rich in carbohydrates and poor in other nutrients needed by the human body. Hence, it is necessary to develop analog rice made from sago which is fortified with food functional components to provide alternative food for the community.

Therefore, the most often thought arising is the need to develop technology for producing analog rice made from sago and fish oil which has an impact on economic added value. At this time, not many food industries have developed analog rice products made from sago. This is due to the limited knowledge, expertise and capital required to produce them.

Literature Review
Added Value

According to 3)Hutagalung (2009), to increase the use of forest product commodities, commodity processing is carried out through a series of production. Value added analysis is the concept often used in the discussion of the processing value. According to 4)MC, Patunru AA. 2012, added value

is the value given from a production process to a product. In the processing of forest products, the added value can be for every cubic meter of logs, every labor worked, or every kilogram of rattan used.

Furthermore, in the production process, the factors affecting the amount of added value consist of many things. The factors can be divided into two categories: technical factors and market factors.

Technical factors consist of product capacity, number of raw materials, and amount of manpower. Meanwhile, market factors consist of output prices, labor wages, raw material prices, and the value of other inputs besides raw material and labor inputs. Mathematically, the calculation of added value according to the method used by 5)Tambunan T. 1997) can be seen in the following formula:

Added Value = f (K, B, T, U, H, h, L)

Information:
K = production capacity (kg)
B = Raw materials used (kg)
T = Labor used
U = Wages of labor (Rp)
H = Price of output (Rp/kg)
h = Price of raw materials
L = Other input values

Food Diversification and Fortification

In the current, modern era, the market is full stocked with various food products. To be different, producers are required to be creative to be able to produce an innovation to offer to consumers. Innovative products accepted by the market (consumers) can provide added value for producers, and they can even dominate the market in certain segments. Hence, the diversification and fortification of a product are critically important to increase business production.

Food diversification and fortification are basic of food security foundation. According to nutritionists, diverse foods will be able to accommodate human nutritional needs. Moreover, food diversification also has other dimensions for food security. For producers, diversification of food consumption and nutrition will incentivize more diverse production, including food products with high economic value and food products based on local resources. Meanwhile, if viewed from the consumer side, the food consumed becomes more diverse, nutritious, quality and safe. In addition, from the point of view of food self-sufficiency, food diversification can also reduce food dependence on one type of food.

Food diversification is defined as an effort to diversify people's food consumption patterns to improve the nutritional quality of the food consumed which will further improve the nutritional status of the population. Food diversification is critically important to prevent dependence on one type of food, like rice. Utilization of various types of natural resources helps to improve the welfare of the community.

The existence of food diversification encourages the emergence of ideas to replace rice as staple food with other food ingredients that can also function as a source of carbohydrates. Some food products that may replace rice are cassava, sweet potato, taro, and other tubers. These food ingredients are still fully-unutilized for public consumption. The obstacle encountered is that it is non-durable food. As follows, it must be processed further with the aim of extending its shelf life. In addition, there is a public perception that consuming non-rice food is considered less prestigious and even sad than consuming rice.

Changing the habit of consuming rice with alternative foods is uneasy. Moreover, only rice is replaced, while the side dishes are still the same, what are usually accompanying rice. Based on that case, the community will of course be rejected the changing. It is because the community is accustomed to eat the side dishes with rice. They believe that the side dishes with rice tastes better. However, the processed non-rice food replacing the rice added with traditional-tastes side dishes or those with familiar taste to the tongue will certainly be easier to be accepted by community.

Assessment of people's consumption habits or consumer acceptance of new food products can be done by interview or by distributing a questionnaire. The collection of survey results on people's consumption habits through questionnaires is more effective than one-on-one interviews because it can reach many respondents in a relatively short time.

Fishery products are Indonesia's natural wealth which has good potential to be exploited. This potential should be balanced with the technology for its processing. Needless to say, it can increase the economic value and production of these commodities.

One way that can be developed to utilize the potential of fishery products is by diversifying processing, as an effort to diversify food and promote fishery products in which so far the products are still being processed directly.

Catfish is one of the well-known freshwater fish in Indonesia, and it possesses economic value. The taste of catfish's meat is delicious and savory, so it is favored by the community. The catfish's meat is thick and has not many spines, and the yield of fish can reach around 40 - 50% by weight.

In addition, catfish can also live and breed in non-flowing waters with low oxygen content, and it has rapid growth. However, the use of catfish as food is still limited. Based on this aforementioned information, it is necessary to diversify the processing of catfish commodity to increase the economic value of this fish. As was anticipated, the selling price of processed meat of fish will be higher than the raw meat.

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This product diversification utilizing catfish as raw material will also increase consumer tastes, and it will help to improve the community welfare. Diversification of catfish processing includes fillet, surimi, kamaboko, nugget, meatballs, and fish protein concentrate.

Analog Rice

Analog rice is a type of rice made from raw materials like cassava, sago flour, corn, tubers, and several other carbohydrate sources. This analog rice is one of the programs from the Ministry of Agriculture to reduce the dependence of public consumption on rice and wheat flour.

Analog rice is a food product resembling rice made from non-rice carbohydrate sources in which the sources have carbohydrate content approaching or exceeding the rice. Analog rice is produced from cassava, sweet potato or sago in which those have a lower Glycemic Index than rice.

Analog rice can be made using an extruder. This tool is able to produce the products massively. Therefore, production capacity will be higher if using an extruder. This product, analog rice, can help diversify the food consumption patterns of the Indonesian citizen to improve the nutritional quality of the food consumed. It will further improve the nutritional status of the population.

Analog rice is one form of alternative food that can be developed to overcome food limitations and meet the availability of alternative food. It can be achieved by both using new food sources and diversifying existing food sources (diversification).

When they are compared, the source of carbohydrates and nutrients contained in rice and analog rice are almost the same. Carbohydrates are one of the macro components in food products containing elements of C, H, and O. Carbohydrates have various functions in the living body, such as fuel (e.g., glucose), food reserves (e.g., starch in plants and glycogen in animals), and building materials (e.g., cellulose in plants, chitin in animals and fungi).

Catfish oil

Fats and oils belong to the lipid group which is organic compounds occurring in nature, and it is insoluble compounds if it is sunk in water. However, it is soluble if it is sunk in non-polar organic solvents, like diethyl ether ($C_2H_5OC_2H_5$), chloroform ($CHCl_3$), benzene and other hydrocarbons. Fats and oils are soluble in the aforementioned solvents because they have the same polarity as the solvents.

Fish lipids are biomolecular compounds found under the fish skin, around delicate and vital organs, and they fill the empty cavities in the tissue. What are included in the lipid group are fats, oils, phosphatides, sterols and steroids. The dietary fats derived from animal products being able to lower plasma cholesterol levels are the unsaturated fatty acid group consisting of omega-3 and omega-6 fatty acids. The unsaturated fatty is essential fatty acids that have double bonds at the third and sixth carbon atom from the end of carbon chain terminal. Linoleic acid is a member of the omega-3 fatty acids required by the body to produce docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA). DHA in the body is critically important for the development of the brain and retina.

Fish oil is divided into two groups: first, fish liver oil which is mainly used as a source of vitamins A and D, and second is fish body oil. Fish oil contains many fatty acids with very long chain more than 20 carbon atoms, most of which have 5-6 double bonds. The fatty acid composition of fish differs depending on the type of fish, the diet and the season.

Initially, fish oil received special attention because of its high levels of vitamins A and D. Further developments, fish oil is known to contain omega-3 fatty acids that have a role for health. In Scotland, fish oil is used to aid to the bone growth and central nervous development. In England, France, Germany, and the Netherlands, cod liver oil is used to treat lung disease, rheumatism and other bone diseases. These various diseases can be cured because fish oil contains omega-3 fatty acids.

Reasearch Method
Research Site And Time

This study was conducted at Micro, Small and Medium Enterprises (MSMEs) "TigaPuteraSelat Panjang" in August, 2020. The research subjects were the processing of analog rice.

Material

The main raw materials used in this study were sago, taro and fish oil supplements. In addition, questionnaire materials and packaging materials were also used.

Methodology

This study was conducted using survey and experimental methods, surveying business conditions and conducting experiments in making analog rice fortified with fish oil supplements.

Data Types and Sources

In this study, data types and sources are primary and secondary data originating from observations on, interviews with, or questionnaires distributed to business actors. Secondary data were obtained through documents, articles, and analogue rice industry literature.

Production of modified analog rice (Syahrul et al. 2018).

For processing of analog rice made from sago substituted with starch of taro, it is carried out with the formula as shown in Table 1.

Table 1. Formulation for producing analog rice made from sago substituted with starch of taro

Raw material (%)	F$_1$	F$_2$	F$_3$
Starch of sago	100	50	0
Starch of taro	0	50	100
Water (ml)	130	130	130

% of the weight of the dough

Processing of analog rice is carried out at MSMEs "TigaPutera" located in Selatpanjang, Meranti Islands. Starting with producing 4 (four) types of analog rice dough formulas in which each dough is fortified with fish oil as described in the research procedure. Next, the dough is wrapped in gauze and steamed for 30 minutes. Under hot conditions after steaming, the dough is put into an extruder. It is performed because it will be challenging to shape it like rice when the dough has cooled down. This process is carried out until the last treatment combination. The finished analog rice is then air-dried to prevent mold growth by reducing the moisture content.

Figure 1. Steaming analog rice dough

Source: Personal documentation

Added Value Analysis

The added value analysis is determined by the method according to 5Kamisi (2011) with the procedure shown in Table 2. These are: (a) value added (Rp), (b) value added ratio (%), showing the percentage of added value from the value of the product, (c) labor remuneration (Rp), indicating the amount of money wages received by direct labor, (d) the share of labor (%), indicating the percentage of employee benefits from added value, (e) profit (Rp), showing the share received by the entrepreneur and (f) the profit rate (%), indicating the percentage of profit to added value.

Analysis of Revenue and R/C

To calculate business efficiency, analysis of R/C (Rodjak, 2006) is used which is the ratio between revenue (Revenue, R) and total cost (Cost, C). Based on the considerations, if R/C > 1, the business is profitable; while if R/C = 1, the business is even; and if R/C < 1, the business is unprofitable.

Table 2. Results of Added Value Analysis on Analog Rice Production

No	Variable	Notation	Analog Rice			
			Sago	Taro	Mixture (Sago+Taro)	Information
1	Production Result (kg/day)	a = bxm				
2	Raw Material (kg/day)	B				
3	**Labor** (HK/day)	C				
4	Conversion Factor (yield)	a/b=m				
5	Coefficient of Labor	c/b=n				

6	Average Product Price (Rp/kg)	D				
7	Average Wage (Rp/work day)	E				
	Income and Profit					
8	Price of Raw Material (Rp/kg)	F				
9	Other input contributions (Rp/kg)	G				
10	Product Value (Rp/kg)	a x d = k				
11	a. Added Value (Rp/kg)	k-f-g=l				
	b. Added Value Ratio (%)	(l/k)%=h%				
12	a. Labor Rewards (Rp/kg)	p=n xe				
	b. Labor Department (%)	(p/l)%=q%				
13	a. Businessman's Profit	r=l-(p*a)				
	b. Profit Rate (%)	(r/l)%=o%				

Source: Processed results of primary data, 2020

According to Pertiwi (2013), the factors that must be known in Hayami's analysis are: value of product output in units of quantity per unit of time, value of input of raw materials in units of quantity per unit of time, amount of labor input in the production process price of output products per unit quantity, average wage of labor, and price of input of raw materials per unit quantity

Data analysis

The data obtained will be processed, tabulated and graphed. Then the processed data will be analyzed descriptively and simple statistics.

Result And Discussion
Organoleptic Test of Analog Rice

The results of the organoleptic hedonic quality assessment of analogue rice with 6 treatment levels can be seen in Table 3 below.

Table 3. The average value of hedonic quality of organoleptic test of analog rice

Repetition	Treatment Level		
	M_5T	M_3TS	M_5TS
1	5.84	**7.52**	**7.32**
2	6.28	**7.24**	**7.32**
3	6.24	**7.24**	**7.44**
Average	6.12	7.33	7.36

In Table 3 above, it can be seen that organoleptically all treatment levels were acceptable to the panelists, but the highest value was found in the combination treatment level of starch of sago and taro. Characteristics of analog rice produced with 3 treatment levels can be seen in Figure 2.
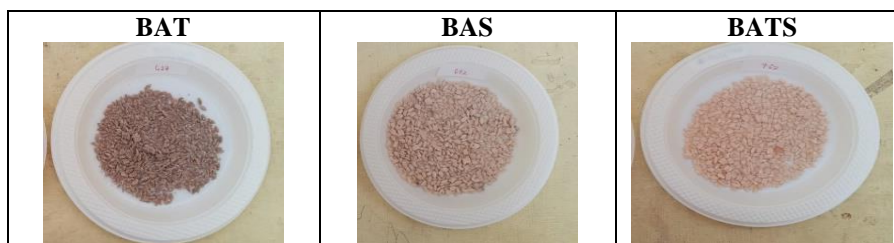

Figure 2. Characteristics of Analog rice made from taro (BAT), Analog rice made from sago (BAS) Analog rice made from taro and sago (BATS)

Added Value Analysis

Based on the added value analysis (Table 4) it is comprehended that the largest added value is obtained from processing of analog rice made from mixture between sago and taro Rp. 11,000,-/kg, and the lowest is from analog rice made from sago Rp. 3,000,-/kg of raw materials. In the business of processing of analog rice made from sago, the profit obtained is Rp. 30,000,-/kg of raw materials, while the profit from the analog rice made from taro is Rp. 130,000,- and

analog rice made from mixture between taro and sago
Rp. 350,000,-

Table 4. Results of Added Value Analysis of Analog Rice Production.

No	Variable	Notation	Analog Rice			Information
			Sago	**Taro**	**Mixture (Sago+Taro)**	
1	Production Result (kg/day)	a = bxm	36	36	36	
2	Raw Material (kg/day)	b	40	40	40	
3	**Labor** (HK/day)	c	2	2	2	
4	Conversion Factor (yield)	a/b=m	0.9	0.9	0.9	
5	Coefficient of Labor	c/b=n	0.05	0.05	0.05	
6	Average Product Price (Rp/kg)	d	15.000	20.000	25.000	
7	Average Wage (Rp/work day)	e	50.000	50.000	50.000	
	Income and Profit					
8	Price of Raw Material (Rp/kg)	f	320.000	400.000	360.000	
9	Other input contributions (Rp/kg)	g	100.000	100.000	100.000	
10	Product Value (Rp/kg)	a x d = k	540.000	720.000	900.000	
11	a. Added Value (Rp/kg)	k-f-g=l	120.000	220.000	440.000	
	b. Added Value Ratio (%)	(l/k)%=h%	0.8	0.85	0.88	
12	a. Labor Rewards (Rp/kg)	p=n xe	2500	2500	2500	
	b. Labor Department (%)	(p/l)%=q%	0.006	0.004	0.003	
13	a. Businessman's Profit	r=l-(p*a)	30.000	130.000	350.000	
	b. Profit Rate (%)	(r/l)%=o%	0.79	0.85	0.87	

Source: Processed results of primary data, 2020

Business Development of Processing of Analog Rice

Some of the business development strategies that should be implemented by MSMEs "TigaPuteraSelatpanjang" are: (1) Product development strategy, through: a) Improving product quality in terms of shape, taste and packaging, including by standardizing standard operating procedures for the company to maintain uniformity of production results, improving packaging design with aluminum foil and completing information on labels with production and expiration dates, and b) Adding product variants aimed at reaching untouched market segments, and (2). Market Penetration Strategy, through: a) Increasing sales promotions aimed at persuading new customers while retaining old customers, b) expanding the marketing area, and c) placing commercial advertisements to persuade consumers to the appearance of the product.

Conclusion And Suggestion
Conclusion

Based on the results of the study conducted, it can be concluded:

1 Processing of analog rice can provide added value in the form of profits for businessman. Remuneration for factors of production, and income for labor. The biggest added value is obtained from processing of analog rice made from mixture of sago and taro, which is Rp. 11,000,-/Kg, and the lowest is from analog rice made from sago, which is Rp. 3,000,-/kg of raw materials

2 Internal factors becoming the main strength of processing business of analog rice are quality products and easy processing. Meanwhile, the main weakness is that people don't know much about analog rice products, especially their benefits. standard one. External factors that become.

Suggestion

Based on the results of the study, the recommendations suggested in the effort to develop business of analog rice at MSMEs "Tiga Putra Selatpanjang" can be added to analog rice variants using sago and taro as their raw materials.

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STUDY OF THE ANTIMICROBIAL ACTION OF NANOGEL USED IN THE TREATMENT OF GINGIVITIS

Abstract: Gingivitis is the most common oral disease in our time. Gingivitis is an inflammatory process of the mucous membrane of the palate. Gingivitis is more common in adolescents and pregnant women. In this category of people, the disease is usually more severe due to hormonal changes in their body. A gel form suitable for use on the basis of natural raw materials has been developed for the treatment of gingivitis. The gel contains clove shoots, propylene glycol-ethanol extract of cinnamon bark and oak bark, colloidal solution of propolis and silver. When using the developed gel in patients, the inflammatory process disappears within 3-4 days.

Key words: gingivitis, nanogel, antibacterial effect, disk diffusion, PMA index, PMI index, PI index.

Language: Russian

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ИЗУЧЕНИЕ АНТИМИКРОБНОГО ДЕЙСТВИЯ НАНОГЕЛЯ ПРИМЕНЯЕМОГО ПРИ ЛЕЧЕНИИ ГИНГИВИТА

Аннотация: Гингивит – самое распространенное заболевание полости рта в наше время. Гингивит – это воспалительный процесс слизистой оболочки неба. Гингивит чаще встречается у подростков и беременных женщин. У этой категории людей заболевание обычно протекает тяжелее из-за гормональных изменений в их организме. Для лечения гингивита разработана гелевая форма, пригодная для использования на основе натурального сырья. Гель содержит побеги гвоздики, пропиленгликоль-этанольный экстракт коры корицы и коры дуба, коллоидный раствор прополиса и серебра. При применении разработанного геля у больных воспалительный процесс исчезает в течение 3-4 дней.

Ключевые слова: гингивит, наногель, антибактериальный эффект, диск-диффузии, индекса РМА, индекса РВI, индекса ПИ.

Введение

Если не лечить, гингивит может развиться с более серьезными осложнениями, такими как пародонтит, который может привести к потере зубов. Причины гингивита очень разные. Их условно можно разделить на внутренние и внешние группы. К внутренним причинам относятся: увеличенные зубы (повреждение растущих десен) и их смещение (прикус), авитаминоз, заболевания органов пищеварения (все области взаимосвязаны), ослабленный иммунитет (для полости рта важен более местный иммунитет) и с. причины. Внешние причины: физические (травмы, ожоги, радиационное воздействие), химические (воздействие агрессивных веществ), биологические (инфекции) и медицинские (ятрогенные) факторы. Зубной камень, налет, остатки пищи, неправильные пломбы, дыхание через рот, курение, химическое раздражение, инфекции вызывают еще больший гингивит. Инфекционный гингивит более актуален для взрослых и детей. Гингивит у детей возникает при несоблюдении правил гигиены. Дело в том, что местная иммунная система еще развивается до 7 лет, а ее полное формирование заканчивается в начале подросткового возраста. Поэтому риск его развития у детей выше даже при отсутствии очагов хронического воспаления. У детей с кариесом риск еще выше. Невылеченные кариесные зубы являются частой причиной гингивита. Гингивит встречается также у детей при ревматизме, туберкулезе, сахарном диабете, заболеваниях печени и желчного пузыря, нефропатии. Длительный прием некоторых лекарственных препаратов, например оральных контрацептивов, может усугубить воспалительный процесс в деснах. Тяжелые металлы (свинец, висмут) также иногда могут вызывать гингивит [5, 12].

Различают несколько видов гингивита: катаральный, язвенно-некротический, гипертрофический и атрофический гингивит. Различают острую и хроническую формы заболевания. Хроническая форма чаще всего обостряется зимой и весной (это проявляется повышенной кровоточивостью) и чаще встречается у пожилых людей. Если заболевание возникает на небе, которое охватывает все зубы одной или обеих челюстей, то его называют распространенным гингивитом. Местный гингивит возникает в одной или нескольких областях десны в некоторых частях неба. Клинические симптомы катарального гингивита: покраснение на почве воспалительного процесса, отек слизистой оболочки неба, кровоточивость. При этой форме гингивита субъективные ощущения больного заключаются в легком зуде в зубах и боли при приеме пищи. При язвенно-некротическом гингивите на слизистой оболочке неба появляются раны и участки некроза. Его клинические симптомы: галитоз (неприятный запах изо рта), болезненность десен; Ухудшается и общее состояние организма: больной ощущает общее недомогание, температура тела повышается до 39 градусов, могут увеличиваться лимфатические узлы. При гипертрофическом гингивите сосочки увеличиваются и часть зуба прикрывается. На ранних стадиях заболевания симптомы отсутствуют. Позже начинаются кровотечения и боли при прикосновении к небу или при еде. При атрофическом гингивите, наоборот, происходит атрофия (редукция) ткани десны, и со временем уровень десны снижается и начинает проступать дно зуба. Люди с атрофическим гингивитом чувствуют это, когда они чувствительны к горячей и холодной пище. Иногда гингивит является просто симптомом пародонтита (воспаление тканей, окружающих основание зуба, костные альвеолы и небо) или пародонтита (воспаление протекает реже, чем деструктивные процессы).

Для профилактики гингивита необходимо принимать следующие меры:

– регулярно проходить осмотр у стоматолога;

– ежедневно устранять кариес с помощью зубной пасты и шелковой нити;

– каждые 3-6 месяцев посещайте стоматолога для чистки зубов [5].

Неосложненный гингивит проходит быстро, обычно в течение 7-10 дней. Хронический требует интенсивного лечения. Если гингивит не лечить, он может привести к пародонтиту и потере зубов (в отличие от кариеса, гингивит является более распространенной причиной потери зубов). При гингивитах, вызванных инфекционно-воспалительными процессами, назначают гигиену полости рта и антибактериальные средства для устранения возбудителя инфекции. Из этих средств известны стоматологические гели, устраняющие воспаление (Камистад), бактерицидные гели (Метрогил Дента, Дентамет), кровоостанавливающие и укрепляющие зубы гели (Пародиум, Элюгель), гели, способствующие заживлению слизистых оболочек (Солкосерил, Асепта, паротонтол) [2, 14].

Несмотря на обилие антибактериальных средств, существует необходимость в разработке новых продуктов для устранения проблемы.

Одним из таких средств является антибактериальный гель на основе экстрактов растений и коллоидного серебра.

Состав наногеля следующий: побеги гвоздики, пропиленгликоль-спиртовой экстракт коры корицы и фитокомпозиция коры дуба, туберкулёз, коллоидный раствор с наночастицами серебра, карбоксиметилцеллюлоза натрия (контроль), хитозан (образец).

Научное обоснование состава. Известно, что побеги гвоздики богаты эфирными маслами. Он также содержит вакцины, фенольные соединения, спирты, флавоноиды и стеролы. Биологически активные вещества корицы: экстракт кожуры корицы обладает выраженным антиоксидантным, противомикробным действием. Его накладывают на раны в виде компрессов, что уменьшает боль и оказывает дезинфицирующее действие. Экстракт содержит витамины C, E, PP, пантотеновую кислоту, пиридоксин, Mg, Ca, Zn, Fe, K, P и другие элементы (сахар, спирты, вакцины, фитонциды) [11].

Кора дуба содержит 10-20% вакцин, в состав которых входит пирогалловая группа, галловая и эллаговая кислоты, а также кверцетин, сахар, жиры, обладающие также вяжущими, антисептическими, кровоостанавливающими свойствами [1, 10].

Биологически активные вещества водного экстракта прополиса обладают природными иммуномодулирующими свойствами, ранозаживляющей способностью, эпителизацией, противовирусным действием, бактерицидными, антитоксическими свойствами [9].

Коллоидное серебро – это естественный антибиотик, на 100% безопасный и нетоксичный для человеческого организма. Коллоидное серебро эффективно против 650 видов бактерий. Патогенные организмы никогда не приобретают к нему устойчивости в отличие от синтезированных антибиотиков. Недавние исследования показали высокую эффективность препаратов коллоидного серебра при лечении гнойно-воспалительных заболеваний челюстно-лицевой области, в возникновении и течении которых важную роль играют полиан-тибиотикорезистентные штаммы микроорганизмов [4, 13].

Экстракт гвоздики применяют для дезинфекции полости рта и горла. Благодаря химическому составу эвгенола это растение оказывает бактерицидное, сильное антисептическое, противовоспалительное действие в стоматологии, а эвгенол обладает способностью уменьшать боль за счет стимуляции соответствующих рецепторов [3].

Хитозан, содержащий полисахариды и используемый для приготовления многих лекарственных форм, обладает широким спектром фармакологической активности, в том числе антимикробными и антитоксическими свойствами [8, 15].

МИКРОБИОЛОГИЧЕСКИЕ ИССЛЕДОВАНИЯ.

Механизм действия геля, изготовленного на основе природного сырья, изучался несколькими способами. Таким образом, диско-диффузионный метод был впервые использован для изучения антибактериальных и противогрибковых свойств.

С целью изучения этих свойств, золотистого стафилококка (Staphylococcus aureus), кишечной палочки (кишечные споры), моховицы, гум-отрицательных бактерий, пигментообразующих грамотрицательных бактерий, как представителя грамположительных бактерий, одного из основных возбудителей возбудители гнойно-воспалительных процессов (сине-зеленый гной), Candida albicans (кандидоз), дрожжеподобный гриб, взят как представитель гриба.

Диско-диффузионным методом готовят взвесь 1 мл микробных клеток в 1 мл из суточной культуры микроорганизма, т.е. взвесь готовят на стерильном физиологическом растворе бактериологической петлей, отбирают небольшое количество суточной микробной культуры из левой поверхности агара и адаптированы к стандарту 1 мл микробных клеток. Затем отдельную микробную суспензию разливают в чашки Петри, содержащие мясо-пептонный агар и агар Сабуро. Миски перемещают медленно, чтобы суспензия равномерно распределилась со всех сторон. Оставшуюся суспензию затем пипеткой переносят в дезинфицирующий раствор. Чаши выдерживают при 37°C в течение 10 минут, чтобы дать раствору немного высохнуть. Затем чашки вынимают из термостата и стерильные диски, смоченные в заранее поставленном растворе, на 3-5 мин помещают на поверхность микробной питательной среды, слегка прижимая пинцетом, чтобы диски хорошо увлажнились. После этого агар с мясопептоном помещают в термостат при температуре 37°C, а в среду Сабуро при температуре 28°C. По мере намокания дисков пропитанное вещество диффундирует в агар и убивает микроб. Через 24-48 часов чаши вынимают из термостата и фиксируют результаты.

Гель-1 (образец)
– *Staphylococcus aureus*   - 21 мм
– *Esherichia coli*   - 12 мм
– *Pseudomonas aeruginoza*   - 6 мм
– *Candida albicans*   - 12 мм

Гель-2 (контроль)
– *Staphylococcus aureus*   - 14 мм
– *Esherichia coli*   - 6 мм
– *Pseudomonas aeruginoza*   - 4 мм
– *Candida albicans*   - 11 мм

Примечание: Цифры обозначают диаметр микробных зон в мм.

Все эксперименты повторяли 3-5 раз.

Staphylococcus aureus

Esherichia coli

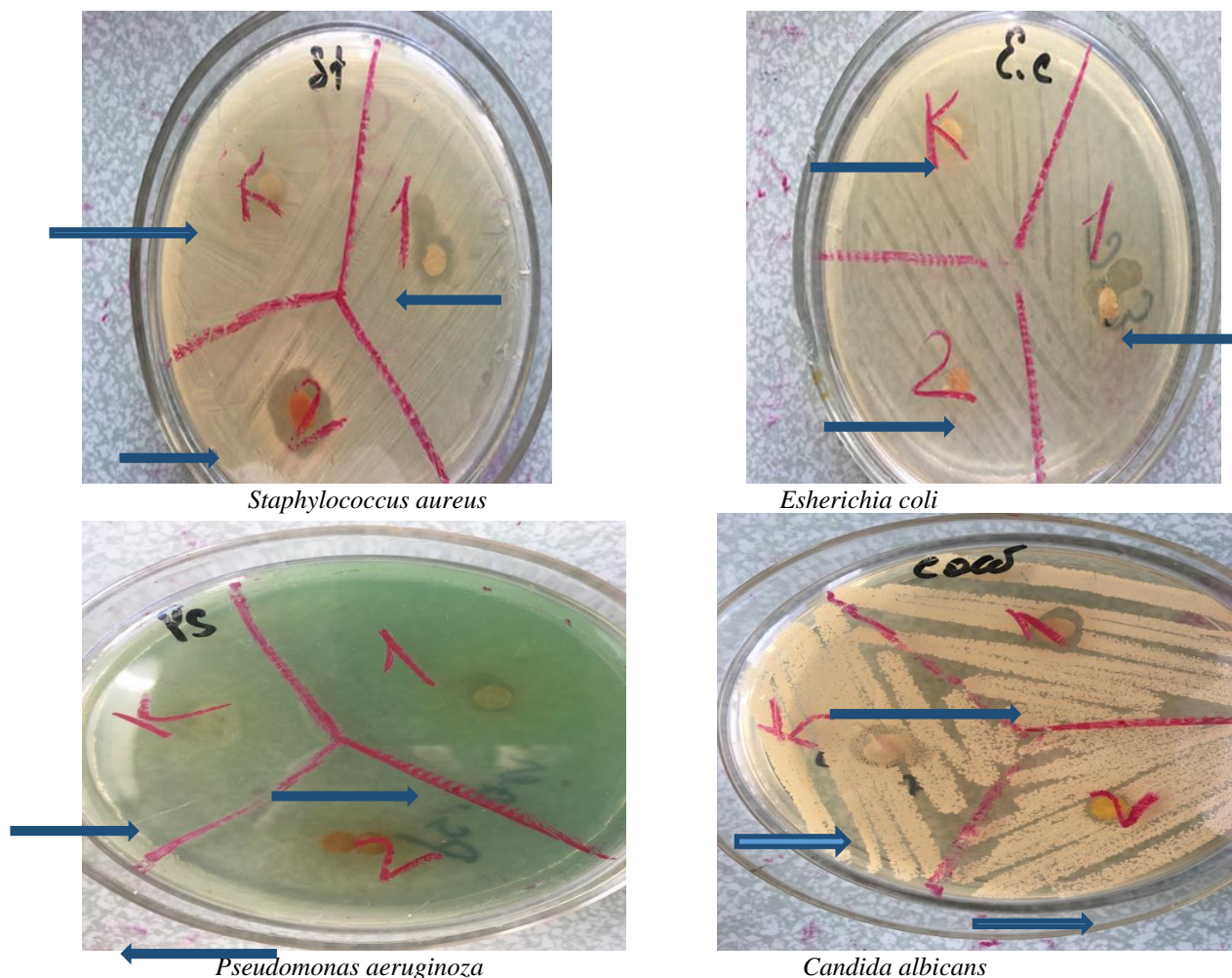*Pseudomonas aeruginoza*

Candida albicans

Рисунок 1.

Опыты также сопровождались контролем, т.е. вокруг и под дисками, пропитанными физиологическим раствором, не образовывалась стерильная зона, наблюдалось полное истощение.

На следующем этапе изучали антимикробные свойства этих веществ методом серийных разведений. Для этого на каждую микробную культуру брали по 4 стерильные пробирки. В 1-ю и 2-ю ампулы наливают по 1 мл испытуемого вещества, в каждую испытуемую ампулу, начиная со 2-й, добавляют по 1 мл стерильной дистиллированной воды. Затем из 2-й ампулы отбирают по 1 мл смеси, добавляют в 3-ю пробирку, из 3-го в 4-ю и из 4-го отбирают по 1 мл смеси и выбрасыают. Возьмите 1 мл смеси и выбросьте ее. Таким образом, исследуемое новое вещество в пробирках разводят в соотношениях 1:100 (1), 1:200 (2), 1:400 (3), 1:800 (4). После разбавления, в каждую пробирку пипеткой Пастера добавляли по 1 капле из микробной взвеси с 500 млн микробных частиц в 1 мл. После 10-минутной, 20-минутной, 40-минутной и 60-минутной экспозиции каждую пробирку высевали на поверхность питательной среды в чашках Петри. Результаты регистрировали через 48 часов в термостате при 28°C для грибов и через 24 часа при 37°C для бактерий (таблица 1).

Таблица 1.

Тестовая культура	Время воздействия (минуты)	Исследуемое вещество							
		1				2 (контроль)			
		1	2	3	4	1	2	3	4
Staphylococcus aureus	10	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-
	40	-	-	-	-	-	-	-	-
	60	-	-	-	-	-	-	-	-

Esherichia coli	10	-	-	-	+	-	-	+	+
	20	-	-	-	+	-	-	+	+
	40	-	-	-	+	-	-	+	+
	60	-	-	-	+	-	-	+	+
Pseudomonas aeruginoza	10	-	-	-	+	-	-	+	+
	20	-	-	-	+	-	-	+	+
	40	-	-	-	+	-	-	+	+
	60	-	-	-	+	-	-	+	+
Candida albicans	10	-	-	+	+	-	-	+	+
	20	-	-	+	+	-	-	+	+
	40	-	-	+	+	-	-	+	+
	60	-	-	+	+	-	-	+	+

Примечание: 1,2,3,4- 1:100, 1:200, 1:400, 1:800 показов; «+» означает полное завершение; «-» означает отсутствие окончания.

Кроме того, в каждую из приготовленных микробных взвесей добавляли по 1 капле геля. В динамике взвесей как представитель грамположительных бактерий Staphylococcus aureus и суспензия Candida albicans как представитель грибов через 24 и 48 часов обладают более активным гелевым действием.

Те же процессы повторялись в контрольном геле.

Исследования показали, что как гель (1) в качестве образца, так и гель (2) в качестве контроля полностью ингибируют рост грамположительных бактерий независимо от степени их концентрирования и разведения. Влияние на грамотрицательные бактерии было слабее.

Приготовленный гель наносят в виде тонкого слоя по 0,5 мл на пораженный участок после очистки полости рта 3 раза в день. При использовании гель уничтожает бактерии и грибки в ротовой полости, уменьшая боль и отек. При этом устраняет кровоточивость и неприятный запах на зубах. Облегчается жевание, твердеют десны, заживают поврежденные слизистые оболочки в течение 3 дней.

Приготовленный противомикробный гель был представлен для клинических испытаний. Результаты показаны ниже:

Больная Р., 27 лет, клиника хронического катарального гингивита. Показатели индекса РМА составили 35,4%, индекса PBI - 0,75 балла, индекса ПИ - 1,67 балла. На пораженную десну аппликационно нанесен антимикробный гель (метрагиль дента) в количестве 0,5 мл двукратно с интервалом 2 суток. Через 5 суток наблюдалось снижение воспаления десны, отмечены уменьшение показателей индекса РМА до 10,5%, индекса PBI - до 0,12 балла, ПИ - до 0,15 балла. Проведено повторное нанесение геля. Через 7 суток определено стойкое снижение воспаления десны (индекс РМА - 2%, индекс PBI - 0,05 балла, индекс ПИ - 0 баллов)

Больная Т., 30 лет, клиника хронического катарального гингивита. Показатели индекса РМА составили 19,4%, индекса кровоточивости сосочков (PBI) - 2,5 балла, пародонтального индекса (ПИ) - 1,69 балла. На пораженную десну нанесена аппликация антибактериальная геля (опыть) в количестве 0,5 мл двукратно с интервалом 2 суток. Через 2 суток определено снижение воспаления десны: индекс PBI - 0,01 балла, индекс РМА - 0,17%, ПИ - 0 баллов. Срок лечения составил 3 дня.

Таким образом, применение разработанный антибактерильный гель при аппликации на десну позволяет ликвидировать воспалительный процесс за период 3-5 дней, сокращает сроки лечения на 4-5 дней.

Для доказательства эффективности всех полученных результатов целесообразно использовать уравнение линейной регрессии [6, 7]. По результатам исследования были выполнены расчеты в программе Matlab.
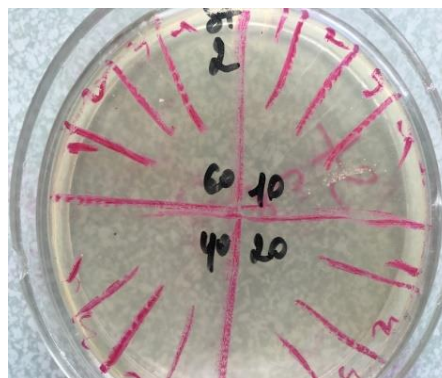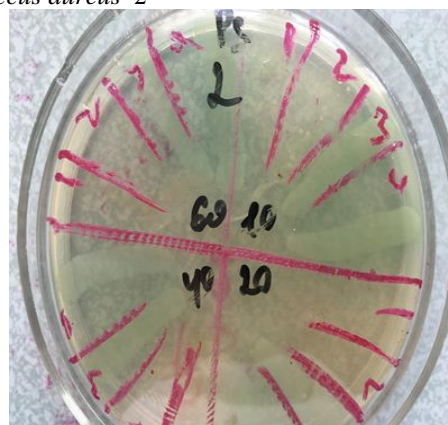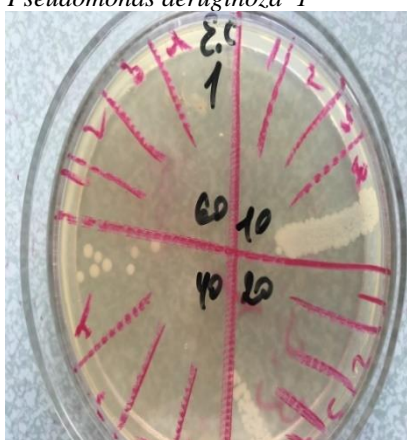
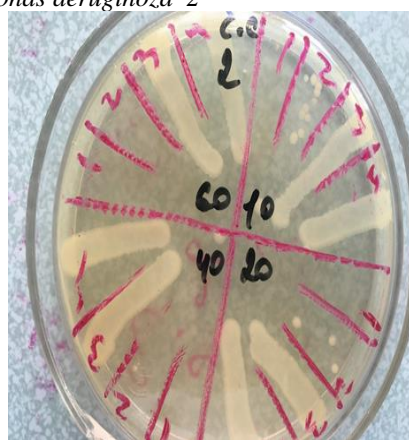*Staphylococcus aureus 1*   *Staphylococcus aureus 2*
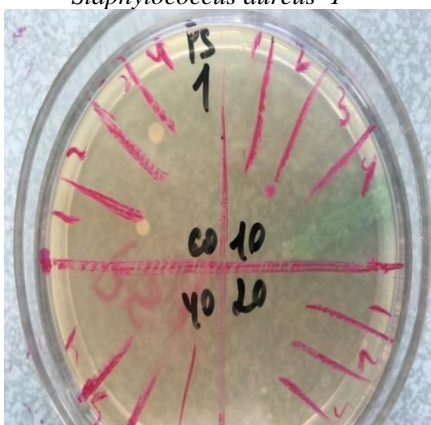
Pseudomonas aeruginoza 1   *Pseudomonas aeruginoza 2*

Esherichia coli-1   *Esherichia coli-2*

Candida albicans 1   *Candida albicans 2*

Рисунок 2.

Таким образом, было изучено математическое моделирование антимикробного действия веществ геля-1 и геля-2 (контроль). Линейную зависимость действия веществ на микробные штаммы изучали с помощью дифференциального уравнения $y=\varphi(x)$ для построения математической модели (график 1).
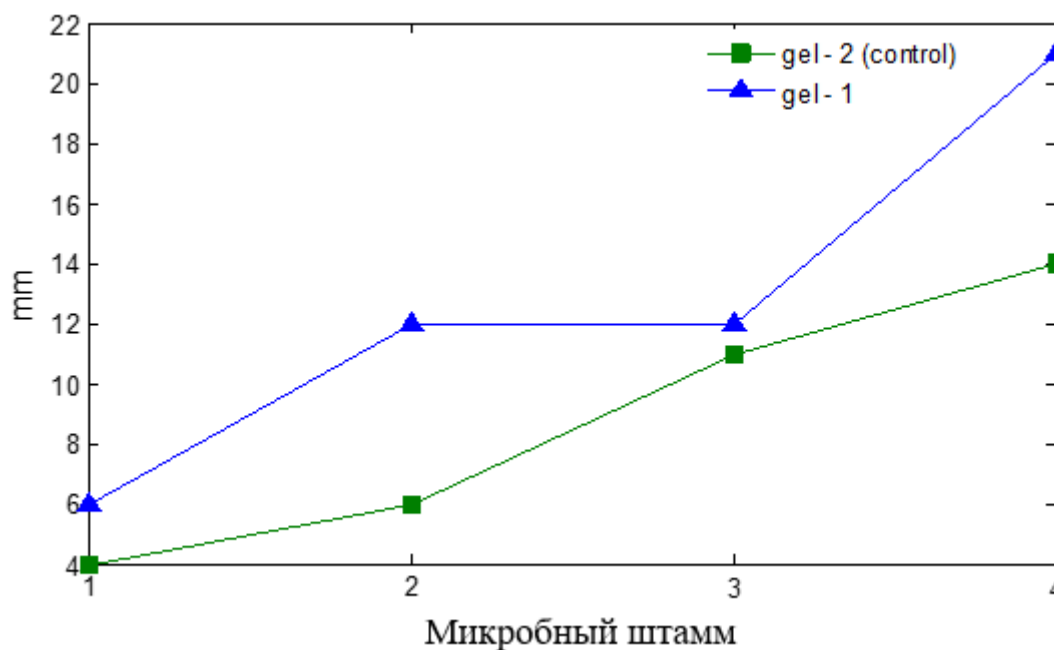

График 1. График линейной зависимости действия веществ на микробные штаммы.
(*1 – Pseudomonas aeruginosa; 2 – Esherichia coli; 3 – Candida albicans; 4 – Staphylococcus aureus*)

Как видно из графика, наименьшее значение в геле-2 зафиксировано у грамотрицательных бактерий Pseudomonas aeruginosa - 4 мм, а наибольшее значение зафиксировано в геле-1 у представителя грамположительных бактерий Staphylococcus aureus - 21. мм.

ЗАКЛЮЧЕНИЯ:

Таким образом, применение разработанный антибактерильный гель при аппликации на десну позволяет ликвидировать воспалительный процесс за период 3-5 дней, сокращает сроки лечения на 4-5 дней.

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ORGANIZATION AND CONDUCT OF PEDAGOGICAL PRACTICE WITH THE USE OF WEB-TECHNOLOGIES

Abstract: *In this article a described issue associated with the Web 2.0 and Google services, the role of pedagogical practice in developed foreign countries, continuous pedagogical practice carried out at all stages of higher education, its role in the system of methodological training of modern competitive personnel and methods of organizing and conducting this practice using web technologies.*

Key words: *technology, social network, internet, pedagogical practice, electronic calendar, Google Calendar, account, Web 2.0, Web technologies.*

Language: *English*

Introduction

World experience requires the introduction of network resources, modern programs and technologies in education, their reform and improvement of mechanisms for training teachers, the development of new organizational forms and methods, their immediate implementation in practice. In particular, the recommendation of the Parliamentary Assembly of the European Union to expand the use of the Internet in educational and cultural institutions became the basis for the organization of a modern education system based on Web technologies and the training of personnel competent to use them. [1]

UNESCO documents state that information and communication technologies, in particular Web-technologies, can serve as modern technologies for education, while Web-technologies should be rationally introduced into the educational process and used in conjunction with new models of education. Training of competent, competitive personnel capable of using Web-technologies in professional activity, creation of modern educational system in higher education institutions, inclusion of Web-technologies in existing forms, methods, means of teaching and creation of methods of their effective use, definition of competencies of Web-technologies, its conditions, the improvement of its content remains relevant.

In order to develop the field of education and science, "further improve the system of continuing education, increase the capacity of quality educational services, continue the policy of training highly qualified personnel in line with modern needs of the labor market; Improving the quality and efficiency of higher education institutions through the introduction of international standards for the assessment of the quality of education and training" [2]. Informatization of the education system requires the training of professional computer science teachers who can use Web-technologies in their professional activities.

According to the results of the analysis of a comprehensive study of the education system of the Republic of Uzbekistan in January-June 2017 by a group of leading foreign experts involved in cooperation with the UN Committee on Education, Science and Culture (UNESCO) and the consulting organization (DGP Research & Consulting) Due to the lack of integrity of theory and practice, the inefficient organization of student internships in manufacturing enterprises, the majority of graduates re-learn their profession after employment, as well as the mechanism of quality control of education meets

modern requirements. shortcomings such as lack of qualified teachers and management staff in educational institutions, insufficient cooperation with foreign educational institutions [3].

Qualification (pedagogical) practice is also one of the most important factors for the development of students of pedagogical universities as mature, qualified specialists. Internship means that students participate in a period aimed at strengthening the theoretical knowledge acquired during the study process, as well as the acquisition of new skills and abilities along with the practical application of this knowledge [4].

In the Federal Republic of Germany, special attention is paid to practice. Internships in Germany have different meanings for students and schoolchildren. If high school students go through an internship to choose more careers or majors, students go through more to consolidate their theoretical knowledge, apply it in practice, and choose their next job. For businesses, internships, as noted above, hire young professionals to select the best professionals during the internship. This is why internship is considered a necessary process for both businesses and practitioners. Due to the importance of internships for graduate students in the German education system, compulsory internship semesters are used in German universities. In particular, graduate students from the University of Economics and Politics (HWP) in Hamburg (HWP) must devote the last semester to writing a diploma and undergoing an internship that must last at least 3 months. This internship institution is usually the first place of work for students. The internship, which has its place in the rules of the university (Pruefungsordnung), must be carried out in the field of study. According to these rules, the study is considered incomplete until the internship is completed and no diploma is awarded. At the end of the internship, a report (Praktikumsbericht) should be written. The report will be used to assess how well students are able to apply their theoretical knowledge in practice during the internship, including to eliminate shortcomings in the learning process and bring it closer to practice [5].

Qualification (pedagogical) internships of students are conducted in educational institutions, basic organizations and enterprises to ensure the integrity of theory and practice in accordance with the general requirements for the content of the working curriculum and science programs of the bachelor's degree program "5110700 - Methods of teaching computer science" Tashkent State Pedagogical University. According to him, it is necessary to provide internships for students to acquire professional skills. 6-12% of the total training period is allocated for qualification (pedagogical) practice.

Qualified pedagogical practice (MPA) plays an important role in the system of methodological training of future teachers of computer science. The effectiveness of the MPA depends to some extent on how it is organized and the professional competence of the Methodist teacher who leads it. We recommend that the mechanism for organizing and conducting MPA on the basis of Web technologies be divided into organizational, operational and control blocks.

The purpose of the internship in the organizational block of the MPA was to train Methodist-teachers with the competence to use Web-technologies, as a task to develop the competence of students to use Web-technologies in the organization and conduct of pedagogical practice. The activity block of the MPA is divided into two activities: Methodist-teacher and practitioner-student. In this case, the Methodist-teacher develops electronic documents of MPA (electronic; calendar, diary, lesson analysis, lesson plans) based on Web 2.0 / 3.0 technologies, remotely controlled by computer or mobile technology, and provides for the management, observation and study of student-practitioner activities. is done. The intern completes electronic documents and submits them to the Methodist-teacher, depending on the scope of his activity. The control block is assessed by observing the electronic documents collected during the MPA period and the test lessons of the student-practitioners. The MPA will result in a future teacher with the competence to use Web technologies.

The use of the Google Calendar service of the Google network, which is one of the largest networks in the organization and management of MPA using Web 2.0 services, helps to properly and effectively organize pedagogical activities for the MPA era. The effectiveness of pedagogical practice depends on its proper organization and management.

Of course a simple (printed on paper) calendar can also be used. Such a calendar is always in our hands, we can carry it with us, open it, see it when needed, enter new information. However, reminders of meetings, recurring events, dates, holidays, birthdays, and class schedules can only be recalled by an electronic calendar, which can control the repetition of these events.

Google Calendar allows users to organize different events, manage multiple calendars, and share calendars with groups. They can view their daily, weekly or monthly calendars. Assignments and tasks that need to be completed each day on the calendar can be assigned in a specific time schedule. This will help not only educators but also students to distribute their daily work properly during their studies or MPA, to make the most of their time.

Students can get information about the activities included in the calendar "Qualification (pedagogical) practice", but do not have the opportunity to change the activities included in the calendar. Users can also be allowed to change events through the calendar setting.

It should be noted that the effectiveness of the MPA in a sense depends on how it is organized and the content of activities carried out in it, the distribution of time is highly prepared by the pedagogical leader. This means that the Google calendar should be used as the most modern tool in the organization and planning of various projects, activities, including pedagogical practice. A number of legal documents will be required to establish and manage the MPA. The main documents are the Charter of pedagogical practice, the plan of pedagogical practice, the program of pedagogical practice and the diary of pedagogical practice. From these legal and regulatory documents, the Charter, plan and program of pedagogical practice are prepared in advance, and the diary is regularly replenished during the internship and fully reflects the activities of the student during the internship.

Web-based management of students' activities in MPA ensures transparency of communication between the head of the qualification (pedagogical) practice and the student-practitioner. Today, the use of home Internet or mobile Internet by the Methodist teacher to transfer new assignments and instructions to students and the daily report of students on the completion of these tasks and instructions to the Methodist teacher (of course, the time limit for each task report) provides freedom in the matter. Students-practitioners must have a personal account on Gmail.com in order to fully use the electronic calendar created on the basis of web-technologies. Students who have their own account will not only be aware of the assignments provided by the MPA leader, but will also be able to use e-learning resources based on Web 2.0 / 3.0 services as templates, independently create didactic materials relevant to the learning process and use them during practice.

In the first weeks of the MPA period, students get acquainted with the pedagogical activities of the school, academic lyceum or vocational college community. They organize educational work in educational institutions, analyze educational hours, as well as observe lessons from several disciplines taught in it. Informatics classes Like other disciplines, classes can be followed for different purposes. For example, monitoring the teaching skills of a teacher with many years of experience, analyzing the lessons taught, providing methodological assistance to young teachers, learning how to identify and assess students 'knowledge, studying teachers' work methods, and so on. Practitioner-students who aim to enter and analyze a teacher's lesson often face difficulties and challenges in clearly defining their actions during access to and analysis of the lesson. Below you can see the Web-based e-learning analysis application at goo.gl/forms/QPFtz7TM0XDJSsnI2 to prevent such cases.

One of the documents that will be the basis for evaluating interns-students on MPA is open and test course designs. An e-learning application based on Web technologies (https://forms.gle/e3A4HBkanSR6NsEy8) has been developed to provide the developed lesson plans to the Methodist teacher. should be presented to the Methodist-teacher. The Methodist-teacher reviews it and explains the shortcomings to the practitioner-students. This, in turn, helps to prevent scientific and methodological errors that students-practitioners may make during the internship, to educate them in a comprehensively methodologically mature way.

In general, Web-technologies are modern technologies that not only provide the educational process with meaningful teaching aids, but also allow the subjects of the educational process to actively communicate with e-learning resources and develop the competence of future computer science teachers to use Web-technologies. are listed. The introduction of Web-technologies in the educational process along with multimedia tools, along with the creation of opportunities such as virtualization, onlineization of the educational process, ensures the integrity and speed of the acquired knowledge.

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MODELS OF INNOVATIVE DEVELOPMENT AND WAYS OF FURTHER FORMATION OF THE NATIONAL MODEL OF THE REPUBLIC OF UZBEKISTAN

Abstract: *This article discusses the theoretical foundations for the formation and development of innovative systems, and in particular, the stages and forms of innovative development are considered, models for the development of innovative development are given, in particular, the national model of innovative development in the Republic of Uzbekistan.*

Key words: *innovation, innovation model, innovation systems, innovation paradigm, susceptibility to innovation.*
Language: *Russian*

МОДЕЛИ ИННОВАЦИОННОГО РАЗВИТИЯ И ПУТИ ДАЛЬНЕЙШЕГО СТАНОВЛЕНИЯ НАЦИОНАЛЬНОЙ МОДЕЛИ РЕСПУБЛИКИ УЗБЕКИСТАН

Аннотация: *В данной статье рассмотрены теоретические основы становления и развития инновационных систем, а в частности рассмотрены этапы и формы инновационного развития, приведены модели развития инновационного развития, в частности национальная модель инновационного развития в Республике Узбекистан.*

Ключевые слова: *инновация, инновационная модель, инновационные системы, инновационная парадигма, восприимчивость к инновациям.*

Введение

Всем известно, что одним из приоритетных условий долгосрочного экономического развития является инновационное экономическое развитие, так как посредством него на макроэкономическом уровне обеспечивается увеличение экономического роста, а на микроуровне получение прибыли.

Обращаясь к истокам возникновения понятия инновационного развития следовало бы обратится к трудам основоположника теории инноваций - австрийского экономиста Й.Шумпетера. который считал, что под инновациями следует понимать возможное изменение, происходящее вследствие использования новых или усовершенствованных решений технического, технологического, организационного характера в процессах производства, снабжения, сбыта продукции [1].

В контексте этого Й.Шумпетером были выделены следующие формы инновационного развития (рис.1):

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Рис. 1 Формы инновационного развития, выдвинутые Шумпетером [2].

Вместе с тем следовало бы отметить, что среди заслуг, связанных с популяризацией понятия «инновация» Й.Шумпетером впервые было введено понятие «созидательное разрушение», как процесс рождения новой экономики в рамках старой и вытеснения последней[3]. Сторонники классической концепции, предложенной Шумпетером склонялись к мнению, что суть инновационного процесса заключается в обеспечение нового уровня взаимодействия факторов производства, благодаря использованию новых научно-технических знаний.

Изучая труды Й.Шумпетера и его единомышленников, следовало бы отметить, что инновационный процесс больше отождествлялся с материальным производством (индустриальная экономика), в то время как инновационная экономика[1] (экономика знаний, интеллектуальная экономика) предполагает, что прибыль создаёт интеллект новаторов и учёных, информационная сфера, а не материальное производство (индустриальная экономика) и не концентрация финансов (капитала).

На сегодняшний день многие учёные и исследователи считают, что именно инновационная экономика обеспечивает мировое экономическое превосходство страны, которая её создает. В настоящее время в число стран с инновационной экономикой и развитым венчурным бизнесом – важнейшей составляющей инновационной экономики – входят Швейцария, Швеция, США, Великобритания, Южная Корея, Германия, Франция, Китай, Япония и другие страны.[4]. С возникновением капитализма образовался и сектор инновационной экономики, включающий специальное образование, науку, креативных предпринимателей и заинтересованное в инновациях государство.

В нижеприведённой таблице приведены этапы становления инновационных систем (табл 1.)

Таблица 1. Этапы становления инновационных систем [5].

Годы	Название этапа	Основные постулаты и положения	Представители этапа
10-40 гг. XX в.	Фундаментальный этап	Формирование концепции длинных волн, циклического развития экономики, формулировка основных категорий инновационного менеджмента	Г. Тард, Н. Кондратьев, Й. Шумпетер Дж. А. Гобсон

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[1] Инновационная экономика (экономика знаний, интеллектуальная экономика) – тип экономики, основанной на потоке инноваций, на постоянном технологическом совершенствовании, на производстве и экспорте высокотехнологичной продукции с очень высокой добавочной стоимостью и самих технологий

40-70 гг. XX в.	Этап детализации	Развитие теории инноваций, проведение прикладных исследований	Р. Солоу, С. Кузнец
70-е гг. XX в. – конец XX в.	Теоретический прорыв	Формулирование и разработка новых подходов в инновационном менеджменте, появление концепции национальных инновационных систем, разработка инновационных стратегий	С. Глазьев, Г. Менш, К. Фримен, Ю. Яковец
начало XXI в.-н.в.	Современный этап	Развитие национальных инновационных систем, развитие методологии управления инновационной деятельностью, инновационными стратегиями	К.С. Бармашов, Р.А. Фатхутдинов и др.

Инновационное развитие со всем его многообразием научным сообществом рассматривается как область исследования, объектом которой является сектор экономики, а предметом изучения – вся совокупность организационных, управленческих и экономических отношений, возникающих в процессе формирования и развития инновационного сектора экономики..

Целью инновационной деятельности в экономической сфере является создание и распространение новшеств в материальной производстве.

Рис. 2 Место инновационной деятельности [6].

Сегодня во многих государствах используют концепцию тройной спирали, тесно связанной с концепцией инновационного развития, предложенной исследователями Г.Ицковицем и Л.Лейдесдорфом. Данная концепция предполагает взаимодействие трёх институтов университетов, государства и бизнеса, причём университетам уделяется лидирующая роль в генерировании предпринимательской среды, инкубации и создании современных высокотехнологических компаний. В то же время миссия бизнеса и власти заключается в поддержке, созданной университетом среды и стимулировании продвижения инновационных проектов. Результат сотрудничества достигается в результате комплексного взаимодействия участников триады.

Модель инновационного развития по тройной спирали базируется на следующих положениях: [7].

Рис. 3 Положения модели инновационного развития по тройной спирали[7].

Говоря о собственной национальной модели инновационного развития республики хотелось бы отметить, что в республике созданы все элементы для успешной инновационной активности всех субъектов.

Так вопросы активизации человеческого капитала и стимулирования инновационной деятельности являются одними из направлений предпринятого курса на модернизацию отраслей экономики. Отмечая важность инновационного развития, глава государства Ш.М.Мирзиёв на совместном расширенном заседании палат Олий Мажлиса отметил: «Сегодня мы переходим на путь инновационного развития, направленного на коренное улучшение всех сфер жизни государства и общества. И это закономерно. Ведь кто выигрывает в нынешнем стремительно развивающемся мире? Только то государство, которое опирается на новую мысль, новую идею, инновацию. Если мы сегодня начинаем строить наше великое будущее, то должны делать это прежде всего на основе инновационных идей, инновационного подхода».

Анализируя предпринятые меры и шаги по внедрению инновационного развития в сферы экономики следовало бы отметить, что исходя из положений модели инновационного развития по тройной спирали были осуществлены следующие шаги:

Во-первых, создана соответствующая организационно-правовая база инновационной деятельности, в частности: Закон Республики Узбекистан «О науке и научной деятельности» №

ЗРУ-576 от 29.10.2019 г. и Закон Республики Узбекистан «Об инновационной деятельности» № ЗРУ-630 от 7 апреля 2020 года, Стратегия инновационного развития Республики Узбекистан на 2019-2021 годы [8] осуществляется Программа комплексных мер по укреплению инфраструктуры научно-исследовательских учреждений и развитию инновационной деятельности на 2017 - 2021 годы [9].

Во-вторых, формирование институциональной структуры - создание Министерства инновационного развития – органа, осуществляющего единую государственную политику в сфере инновационного и научно-технического развития республики, формирование при нём Фонда поддержки инновационного развития и новаторских идей. В 2017 г. в соответствии с Указом Президента было образовано Министерство инновационного развитияи Фонд поддержки инновационного развития и новаторских идей. [10]. Также данным Указом были определены основные направления инновационного развития Республики Узбекистан:

В- третьих, в ходе реализации поставленных в стратегии инновационного развития ориентиров республика по рейтингу Глобального инновационного индекса сместилась с 122 места в 2015 году, в 2020 году – 93, в 2021 году - 86, то есть на 36 позиций. Планируется вхождение Республики в состав 50 передовых стран мира [11].

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ANALYSIS OF CARBAMATE DERIVATIVES OF CELLULOSE SYNTHESIZED ON THE BASIS OF LOCAL RAW MATERIALS

Abstract: *In this paper, the composition of cellulose fiber was determined using chemical methods. To study the molecular properties of cellulose and the chemical structure of the obtained products, viscometric method and IR-spectroscopy, Mass-spectrometric, differential scanning calorimetry were used. By processing reed cellulose with alkali and urea, a cellulose product containing carbonyl and amide groups was obtained.*

Key words: *degree of polymerization, viscometric method, IR spectroscopy, IR spectroscopy, Mass spectrometric, differential scanning calorimetry.*

Language: *English*

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Scopus ASCC: 1605.

Introduction

Carbamate cellulose (CTs) is a biodegradable and environmentally friendly bio-based cellulose product. One of the most important features of this crop is that it can be used as a filler in the composition of disposable polyethylene films used for the cultivation of seasonal crops in open fields. The obtained polyethylene films do not decompose under the influence of external factors, leaving no waste, and as a result of this decomposition, carbamate cellulose acts as a fertilizer for plants. It is also an alternative polymer product to the viscose process, which is carried out using oil products and cellulose fibers [3].

Additional research is being conducted to determine the optimal ratios of reagents in the interaction of cellulose with urea, the amount of nitrogen in the obtained carbamate cellulose. The dependence of nitrogen concentration on solubility in urea-alkaline composite is also studied [4].

Hydrogel and aerogel are obtained by good dissolution of the modified cellulose product in a urea-alkaline composite. The transparency of carbamate cellulose (CTs) obtained by modification of cellulose and the degree of swelling in urea-alkaline composite are also evaluated [5].

To carry out the experiment, a mixture of stalks and leaves of crushed reed plant up to 2-3 cm was thoroughly washed in distilled water, sand and other impurities were removed and then thoroughly dried.

The experiments were performed in an autoclave equipped with a mixer, thermometer and manometer. The work began by immersing the raw material in a solution of a certain concentration of alkali to separate the cellulose. The heating process takes about 3 hours. Alkaline solutions of different concentrations were used in the study. The cane, soaked in sodium hydroxide solution, was then placed in an autoclave, the autoclave lid was tightly closed, and the heating was turned on. The work was carried out at different temperatures and heating times. According to the results of the analysis, it was concluded that the best cellulose yield was obtained at a temperature of 120 ° C and a heating time of 1.5 hours. The work was then carried out by heating the autoclave to a temperature of 120 ° C and maintaining this temperature for 90 min [6].

The pressure in the autoclave was maintained at 1-1.5 MPa. At the end of the process, the resulting mass was removed from the autoclave and washed thoroughly in distilled water. During washing, the pH of the washed water was determined using indicator paper. washed to pH = 7.5. The washed mass was then placed in an oven to dry at 40–60 ° C. Due to the fact that the resulting product has a light yellow color after drying, the bleaching process was carried out using a freshly prepared 3% sodium hypochlorite solution. This process was carried out in a reactor equipped with a mixer, a thermometer and a return cooler[7].

The dried product was placed in a reactor, sodium hypochlorite solution was poured over it, a stirrer was started and stirred at a speed of 300 rpm. The temperature was maintained at 70 ° C. The process takes about 1.5-2 hours. The resulting mass was then thoroughly washed with distilled water to pH = 7.5. The resulting product was dried in an oven at a temperature of 60-70 ° C. The result is a white product - cellulose fiber. The resulting product was weighed, compared with the feed weight, and the reaction yield was calculated. The yield of the reaction was 46.5-51% [8].

The results obtained and its discussion.
Chemical and physicochemical confirmation of synthesized cellulose carbamate content

Cellulose is the most widely used and most abundant organic substance in the chemical industry and is an integral part of the cell walls of all higher and lower plants (trees, shrubs, grasses, algae, fungi, etc.). According to the literature, cellulose is formed as a result of complex biochemical changes in plant composition (including photosynthesis reaction). The glucose formed in the photosynthesis reaction enters the polymerization reaction to form the cellulose macromolecule:

$$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2 \quad (1)$$
$$nC_6H_{12}O_6 \rightarrow (C_6H_{10}O_5)\,n + nH_2O \quad (2)$$

Cellulose is the main chemical component of wood and plant residues (stems, leaves, roots), they contain from 40 to 60%. Reeds contain up to 42% cellulose, straw and corn stalks up to about 30%, and cotton up to 93%. Its physical, physicochemical and chemical properties depend on the chemical structure and physical structure of the cellulose (macromolecular shape, intermolecular interactions, etc.). Therefore, it is included in the class of linear homopolysaccharides. The cellulose macromolecule has a long unbranched structure and consists of a chain of monomers of b-D-glucopyranose anhydrides bound to each other by 1-4 glycoside bonds [9].

Chemical method. To confirm the structural formula of cellulose, it was first hydrolyzed:

$$(C_6H_{10}O_5)\,n + nH2O \rightarrow nC_6H_{12}O_6 \text{ cellulose}$$
$$\text{D-glucose}$$
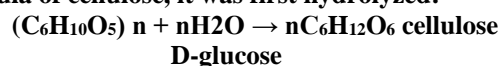
The formation of D-glucose confirms the presence of this glucose monomer in cellulose.

Given the presence of 3 hydroxyl groups on 2, 3 and 6 carbon atoms in each monomer link, the hydroxyl groups on 2 and 3 carbon atoms are secondary and the hydroxyl group on 6 carbon atoms is primary groups, the presence of b-glycoside bonds between monomers proved that the synthesized cellulose carbamate is not hydrolyzed in the presence of the enzyme maltose (maltose hydrolyzes α-glycoside bonds), but is hydrolyzed by the emulsion enzyme specific to b-glycoside bonds. This means that the synthesized cellulose carbamate contains b-D-glucopyranose.

Determination of molecular mass by cryoscopic method. The molecular mass of the synthesized cellulose carbamate was determined cryoscopically. When 100 g of NaOH / ZnO mixture was added to the cryostat as a solvent, its freezing point was measured to be -3.36 ° C. Then 1.2 g of cellulose carbamate was dissolved in 100 g of this solvent and its freezing point was -5.24 ° C. Based on the results obtained, the molecular mass was found using the following formula:

$$M = K * a * 1000 / b * DT$$

Here, since the K-cryoscopic constant is not in the reference for cellulose carbamate, it was found that the cryoscopic constant of high molecular weight compounds proposed by British scientist James Odonnel for cellulose derivatives is 1149.5 according to the phase rule and quantum theory.

a- solvent mass, 100 g; b- cellulose carbamate mass, 1.2 g. DT = 5.24-3.36 = 1.88.

M = 1149.5 * 100 * 1000 / 1.2 * 1.88 = 106594.

Hence, it was confirmed that the average molecular mass of the synthesized cellulose carbamate was 106594 when calculated cryoscopically.

Determination of the degree of polymerization. The degree of polymerization is a key factor in determining the composition of cellulose products, which is determined by the following formula:

$$PD = MM / 223$$

Here, the molecular mass of the MM-cellulose product is the molecular mass of the 223-monomer cellulose carbamate $C_7N_{11}O_6N$. The value of PD varies depending on the type of plant from which the cellulose is obtained. The PD of cotton cellulose ranges from 15,000 to 20,000, while that of wood pulp ranges from 5,000 to 10,000. When cellulose is extracted from wood fiber, it is destroyed and the PD value decreases. Because cellulose, like other polymers, is a mixture of macromolecules with different degrees of polymerization, its molecular mass also varies. This condition is called polydispersity. For the above reasons, the molecular mass of polymers, particularly cellulose, is obtained as an approximate average value.

$$PD = 106594/223 = 478.$$

This means that the average polymerization rate of the synthesized cellulose carbamate is 478.

We used the mass spectrometric method in view of the need to compare these results with modern methods of physical and chemical analysis.

Mass spectrometric analysis. To confirm the structure of cellulose carbamate, a sample of solid cellulose carbamate obtained by Delta-Plus mass spectrometer of the Central Laboratory of the Surkhandarya Regional Sanitary-Epidemiological and Peace Agency was analyzed [10].
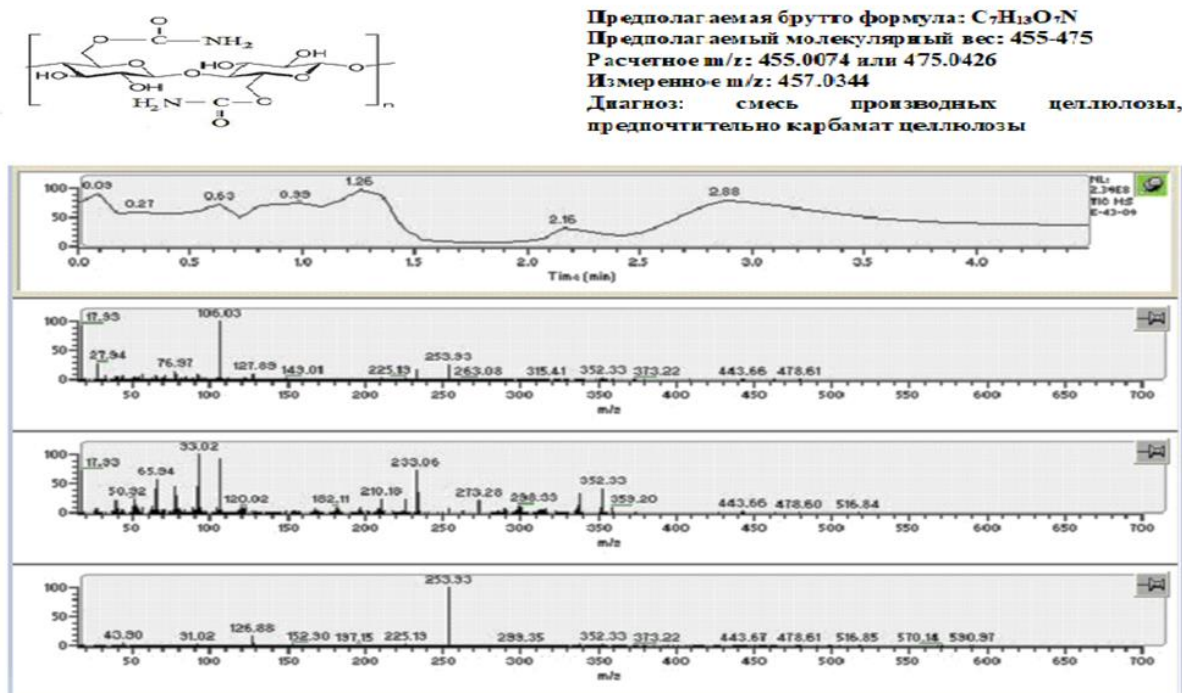
Figure 1. Results of mass spectrometric analysis of cellulose carbamate

As can be seen from Figure 1, the initial molecular mass of the cellulose carbamate sample in the mass spectrum starts from 478.61, the areas of functional groups leaving it, including 2 hydroxyl groups at 443.66, the CH_2OH group at 373.22, 127, The presence of an oxygen atom in 69 areas and finally a carbon atom in 12.33 areas is seen.

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THE MAIN ISSUE OF MODERN UZBEK ENTREPRENEURIAL PHILOSOPHY: PROBLEMS AND SOLUTIONS

Abstract: This scientific article describes the ideas for creating a modern Uzbek entrepreneurial philosophy, developing its explanatory apparatus and solving the main issue in the conditions of a renewed Uzbekistan on the basis of scientific and practical evidence.

Key words: renewed Uzbekistan, philosophy, entrepreneurship, business, property, forms of ownership, philosophy of entrepreneurship, the main issue of the philosophy of entrepreneurship.

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Introduction

The XXI century has entered the history of mankind as a period of intellectual development of mankind, and private entrepreneurship and business based on skill, which is one of its main driving forces, is becoming one of the main factors ensuring the free and prosperous life of its citizens. Thus, entrepreneurship began to show its creative power, penetrating not only into the economy, but also into the socio-political, spiritual and cultural spheres. This requires raising it to the level of an independent branch of science through scientific research as a social phenomenon, the formation and development of a new philosophical direction corresponding to the spirit of the times - the Uzbek philosophy of entrepreneurship.

Since the 1980s, skill-based entrepreneurship has been studied as an interdisciplinary science in social sciences as a social reality: social psychology, sociology, demography, management theory, cognitive. In countries such as the USA, Europe, China, India, Southeast Asia and Australia, there has been a steady stream of entrepreneurship research in recent decades. Their results have been published in dozens of scientific journals with a high impact factor. At the same time, scientific and practical conferences and congresses on the role of entrepreneurship in people's daily lives, economic development, new projects, methods and tools of its organization are regularly held. These include the Babson College Conference in the USA, the RENT European Conference and the ISBE British National Congress.

Today, a comprehensive scientific study of the development of private entrepreneurship and small business based on skills (entrepreneurship) is one of the areas of global importance, and individuals, labor and service communities who have achieved great success in the scientific study of this process are annually awarded international prizes.

In the first year of Uzbekistan's independence, in 1991, the Law of the Republic of Uzbekistan "On Entrepreneurship"[1] was adopted. This historical document created the conditions for the practical implementation of commercial entrepreneurship in our independent country, as well as the legal basis for scientific research.

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[1] Ўзбекистон Республикасининг 1991 йил 30 сентябрдаги 364-XII-сон "Тадбиркорлик тўғрисида" қонуни.//
Ушбу Қонун Ўзбекистон Республикаси Олий Мажлисининг 1999 йил 14 апрелдаги 755-I-сон «Тадбиркорлик ва тадбиркорлар фаолиятининг кафолатлари тўғрисида»ги Ўзбекистон Республикаси Қонунини амалга киритиш хақида»ги қарорига асосан ўз кучини йўқотган.

After full independence, significant work has been done to create a regulatory framework for the comprehensive development of skills-based entrepreneurship[2]. For example, for the development of skills-based entrepreneurship only in 2017-2021 more than 20 decrees, resolutions and laws have been adopted: PD № 2700 "On measures to eliminate bureaucratic barriers and further increase the freedom of entrepreneurial activity" (27.12.2016), PD № 4933 "On measures to further simplify procedures and accelerate the sale of state-owned objects for business purposes" (17.01.2017), PD № 2750 "On additional measures to improve the mechanisms for providing public services to business entities" (01.02.2017), PD № 2746 "On measures to further expand and simplify the micro-credit system for small and private businesses" (31.01.2017), PD № 2768 "On the creation of a guarantee fund for the development of small business" (10.02.2017), PD № 2796 "On measures to further stimulate the use of production areas by entrepreneurs" (23.02.2017), PD № 2843 "On measures to create additional favorable conditions for doing business in the Republic of Karakalpakstan and Khorezm region" (17.03.2017), PD № 2844 "On measures to further simplify the system of micro-crediting of business entities and the general population" (17.03.2017), PD № 5037 "On the establishment of the Institute of the Commissioner under the President of the Republic of Uzbekistan for the protection of the rights and legitimate interests of business entities" (05.05.2017), PD № 5409 "On measures to further reduce and simplify licensing and licensing procedures in the field of entrepreneurship, as well as to improve business conditions" (11.04.2018), PD № 3697 "On additional measures to create conditions for the development of active entrepreneurship and innovation" (05.05.2018), PD № 3777 "About the implementation of the program "Every family is an entrepreneur" (07.06.2018), PD № 5490 "On measures to further improve the system of protection of the rights and legitimate interests of business entities" (27.07.2018), PD № 3970 "On additional measures to create conditions for entrepreneurship" (15.10.2018), PD № 5583 "On additional measures to improve the mechanisms for financing projects in the field of entrepreneurship and innovation" (24.11.2018), PD № 29 "On the priority directions of the state policy for the development of entrepreneurship, employment and poverty reduction in the Mahalla" (03.12.2021), PD № 6314 "On measures to further reduce the administrative and tax burden for business entities, improve the system of protection of legitimate business interests"

(15.09.2021), PD № 6208 "On additional measures to support entrepreneurship, promote employment, social protection and meaningful organization of free time for young people" (20.04.2021).

If we pay attention to the philosophical essence of these decisions made by the President of the Republic of Uzbekistan on the formation and development of entrepreneurship based on skills we will understand that: firstly, the existence of entrepreneurship as a social reality; secondly, entrepreneurship is the cornerstone of a market economy; thirdly, the main factor in eliminating unemployment in our country and ensuring a peaceful and prosperous life for every family; fourthly, it is the most effective means of ridding people of such vices as "dependence", "indifference" and "negligence", and fifthly, it is a methodologically significant document that opens the way to the creation of the Uzbek national philosophy of entrepreneurship.

An urgent need is to identify the main problems of any field of science entering the world scientific arena, passing it through the logic of philosophical thinking and theoretical and methodological justification of its significance for the present life and the future of mankind.

From this point of view, after the restoration of the independent development of the Uzbek people as a modern value, based on the requirements of a modern market economy, *"... support for entrepreneurial activity is the most effective way to improve the welfare of citizens, the ultimate goal of restoring a new Uzbekistan"[3]* - it is desirable to correctly identify the main problems of Uzbek entrepreneurial philosophy, which are being formed anew, highlighting theoretical and methodological, scientific and practical issues of entrepreneurship, which are considered as a socio-economic, political and legal, spiritual and cultural phenomenon.

The main issue of modern Uzbek entrepreneurial philosophy is - property. The question arises, what is "property"? This question can be considered by scientists in different ways, depending on the purpose for which they use property in society. For example, Q.N.Nazarov gave the following definition: "Property is an economic category, which is expressed in the relations between social production. The development of ownership forms is determined by the development of productive forces"[4], V.P.Mozolin, A.I.Maslyaev: "Property is a legal category, the most complete set of rights that a legal entity can have in relation to its property"[5], Neil K. Komesar: "... property rights are recognition of the fact that everyone in society as a whole has the right to own certain property, and that

[2] Тадбиркорликка оид 250 дан ортиқ қонун,қарор ва фармонлар қабул қилинган.

[3] Мирзиёев Ш.М. Янги Ўзбекистон демократик ўзгаришлар, кенг имкониятлар ва амалий ишлар мамлакатига айланмоқда. – Toshkent "Õqituvchi " MU MCHJ, 2021. - Б.20.

[4] Назаров Қ.Н. Жаҳон фалсафаси қомуси. 1-китоб. – Т.: "Маънавият" нашриёти,2019. - Б.838.(920 б.)

[5] Гражданское право. Учебник / В. П. Мозолин, А. И. Масляев. — М.: Юристъ, 2007. — Т. I. — С. 362. — 719 с.

only economic relations of supply and demand are established for them"[6], V.A. Kamenetsky, V.P. Patrikeev: "Property is not only a specific product, but also a package of rights to use this product"[7], A.E. Ishmukhamedov, L.A. Sitdikova: "Property is reflected in economic activity, including in the conditions of use of material resources, maintenance of ownership, development"[8]. There are a lot of such examples.

However, for some reason, the Law of the Republic of Uzbekistan "On Property in the Republic of Uzbekistan" (adopted on October 31, 1990 No. 152-XII and is still in force) does not define the concept of "property"[9].

Summarizing the above, the concept of "property" can be philosophically defined as follows.

Property is material and spiritual wealth created and preserved by the conscious labor of people, saved, avoided, economically consumed and regularly multiplied.

Consequently, property is wealth, consciously acquired by a person at the early stages of entrepreneurial activity on the basis of skills and abilities, manifested in the forms of universality and individuality. From this point of view, the main issue of modern Uzbek business philosophy is the question of ownership, its management and for what purposes it is used.

There are the following aspects of solving the main problem of modern Uzbek entrepreneurial philosophy.

The first issue. We are talking about what constitutes the object of the philosophy of entrepreneurship, which has the following solution in the legislation of our country, that is, to its objects: "... land, groundwater, inland waters, airspace, flora and fauna, buildings and structures, products, dwellings and apartments, trademarks, industrial designs, inventions, utility models, industrial designs, integrated circuit topology, breeding achievements, products, signs and service marks, equipment, objects of material and spiritual culture, money, securities and other property; human ability to work[10]". The whole point here is to find an answer to the question: what objects can be used for the effective organization of entrepreneurial activity, using the objects specified in the law when solving the main task of entrepreneurship? This issue is considered in article 14 of the Law of the Republic of Uzbekistan "On guarantees of freedom of entrepreneurial activity",

entitled "Property foundations of entrepreneurial activity": "Entrepreneurial activity can be carried out on the basis of the own property of business entities and (or) on the basis of attracted property[11]".

The solution to this issue is as follows:

first, the introduction of the idea of an "entrepreneurial state" that does not allow entities to dispose of all state property;

secondly, the transfer of all types of state property to all entities with large financial resources;

thirdly, it can be solved by evenly distributing small types of property among all citizens.

If the main problem of the philosophy of entrepreneurship is solved in this way, then the first approach consists in the monopolization of state entrepreneurship; the second leads to the formation, development and sustainable settlement of monopolized large entrepreneurship, and the third leads to small business and private entrepreneurship. The most important issue at the same time is to solve it dialectically, avoiding metaphysical views, ensuring the diversity of property objects.

The second issue. The question of who and what constitutes the subject of the philosophy of entrepreneurship is decided in the legislation of our country: "... citizens, communities, their associations, public organizations and religious organizations, family and other associations of citizens, local self-government bodies, Councils of People's Deputies of all levels and government bodies authorized by them, other states, international organizations, legal entities and citizens, stateless persons[12]". It is safe to say that the degree to which these entities are engaged in entrepreneurship based on skills and abilities is the second epistemological aspect of solving the main problem. The solution to this problem is to find the answer to the question whether everyone can be an entrepreneur.

It is known that such simple knowledge is not important enough for these entities to engage in entrepreneurial activity. To do this, an entrepreneur will be able to achieve his goals through philosophical thinking, acquiring the most up-to-date knowledge.

The third issue. Another aspect of solving the main problem of the philosophy of entrepreneurship is to increase the diversity of forms of ownership by legal means, due to the objectivity and unity and dependence of the subject on the disposal of existing property, the effective use of the system of national spiritual values in their development. The search for a

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[6] Neil K. Komesar. Law's limits. The rule of law and supply and demand of rights. Cambridge University Press. 2001. P. 126—135
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[9] https://lex.uz/docs/111466

[10] Ўзбекистон Республикасининг «Ўзбекистон Республикасида Мулкчилик тўғрисида" қонуни. 3-модда. // https://lex.uz/docs/111466.
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[12] Ўзбекистон Республикасининг «Ўзбекистон Республикасида Мулкчилик тўғрисида" қонуни. 4-модда. // https://lex.uz/docs/111466.

solution to this aspect of the problem is directly related to the formation of a culture of entrepreneurship.

At the same time, the ***culture of entrepreneurship*** is based on risk and initiative in accordance with the established socio-economic, political, legal, ethical and moral norms of society, acting in order to generate income and profit from the production of goods and services from one's own property or the property of others - this is an integrated system of theoretical and practical behavior.

In a market economy, the more the entrepreneurial culture of the population is formed and developed, the more stable society and the more prosperous life will be there.

For example, only in the Samarkand region in 2018 there were 20,699 business entities, and by 2021 their number reached 43,230[13]. Thus, over the past three years, their number has increased to 22,630 units. This word requires a deeper study of the philosophical aspect of business-oriented entrepreneurship as a driving force that provides employment for the working population of the renewed Uzbekistan. And this means that the problem described above will pass in a healthy or unhealthy way, depending on how it would be solved.

Summarizing the above points, concluding we can recommend the following.

1. In order to further increase the entrepreneurial abilities of the population on the basis of skill-based entrepreneurship, it is necessary to organize training for them to study the main problem of the philosophy of entrepreneurship and modern directions of its solution. In order to do this, it is necessary to organize philosophical readings among the population on the topic "The philosophy of entrepreneurship – the spiritual basis of entrepreneurship".

2. It is advisable to hold meetings with young people in each mahalla on the topic "entrepreneur - owner" with the participation of experienced entrepreneurs and organize work on the formation of entrepreneurial thinking in the minds of young people.

3. The modern Uzbek philosophy of entrepreneurship plays an important role in creating the foundations of the Third Renaissance, especially in the socio-economic, political, legal, spiritual and cultural image of the renewed Uzbekistan, as a field of knowledge that studies the origins, formation and development of entrepreneurship based on skills and abilities.

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Issue   **Article**

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PRAGMALINGUISTIC FEATURES OF THE SPEECH ACT OF A QUESTION (BASED ON THE MATERIAL OF THE AMERICAN VERSION OF THE ENGLISH LANGUAGE)

Abstract: The pragmalinguistic features of the question as an act of speech are considered. Being similar to motives in relation to illocutionary force and perlocutionary effect, the questions differ significantly from them in their locative and propositional components, which makes it possible to separate the questions into a separate group of speech acts. A study of the question based on the material of modern American films shows that 70% of interrogative statements are used as direct speech acts, directly to request information. Among them, about a quarter contain secondary illocutions. Questions as indirect acts of speech (mainly to express a sentence) are implemented in 20% of statements. Rhetorical (false) questions made up only 10% of all interrogative statements.
Key words: pragmalinguistics, speech acts, questions, the American version of the English language.
Language: English
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Introduction

Already at the stage of formation of pragmalinguistics, researchers became interested in the characteristics of the question and its potential as a speech act [1-3], however, many of the pragmalinguistic features of the question are still controversial. It was noticed that questions are always associated with the impact on the emotional-volitional sphere of the interlocutor and in this sense are similar in their pragmalinguistic characteristics to the motivational acts of speech, such as advice, requests, orders, suggestions. On the other hand, it is impossible not to agree that the intention to encourage someone to perform an action differs from the intention to obtain the necessary information [4-7], although both intentions can be embodied in speech both explicitly and implicitly [8].

The purpose of this article is to identify the pragmalinguistic features of the question as a speech act, using the material of the American version of the English language.

In the already classical taxonomy of speech acts, proposed by the American linguist J. R. Searle, the question relates to directives, i.e. to motivational speech acts. J. R. Searle offers twelve criteria for distinguishing speech acts, the most significant of which he calls: 1) the difference in purpose; 2) the difference in the direction of adaptation between words and the world; 3) the difference in expressed psychological states. According to J. R. Searle, the features of motivational acts of speech are the following:

1) the illocutionary goal consists in attempts on the part of one subject "to ensure that... [another subject] has done something", where "something" is a mental, physical or verbal action;

2) the direction of adaptation - "from the world to words";

3) a pronounced psychological state - the desire or need of the subject [2, 182].

J. R. Searle believes that, first of all, the similar illocutionary component, the intention (and not the locative, propositional or perlocutionary components) of motives and questions allow them to be attributed to the same class of speech acts. When prompted, one subject tries to get the other to perform some action.

By asking a question, one subject tries to get the other to answer [9]. This is confirmed, for example, by the fact that the following statements have the same illocutionary force:

(1) Tell me the name of the first President of the United States.

(2) What's the name of the first President of the United States? [9, 182].

According to J. R. Searle, the similarity of motives and questions in relation to illocutionary force partially explains the fact that the verb *ask* in English is used both for questions and requests [9, 69]:

(3) He asked me to do it.

(4) He asked me why.

Example 3 contains a request, example 4 contains a question, but in both cases the verb ask is used.

J. R. Searle also identifies two types of questions:

1) real questions, i.e. questions that one subject asks in order to get an answer from another subject;

2) test questions ("exam questions"), i.e. questions that one subject asks to check whether another subject has any information [9, 69].

The German linguist D. Wunderlich offers a different point of view on the questions. Recognizing that the illocutionary force of questions and motives is the same, he notes the most important differences in their propositional content. Motives, in his opinion, contain an indication of a causable action, but questions do not. On this basis, D. Wunderlich argues that the question should not be included in the class of motives, and suggests considering questions as a separate class of speech acts, calling this class "erotetives" [1].

The German sociologist, the largest representative of the Frankfurt School J. Habermas explores the content of statements from the point of view of linguistic, intentional, propositional and collocutive components [10]. Taking the relation to the world, listening or speaking, and the claims arising from this as the basis for the classification of speech acts, J. Habermas singles out communicatives, constatives, representatives and regulatives [11]. Thus, the motivational speech acts of J. Habermas refers to regulatives, since they explicate the coordination of the actions of the addressee of the causated action by the speaker. Claims regarding regulations are that they are directed at the addressee and must be correct and appropriate. The mode of communication is interactive. However, it should be noted, also to the regulations of J. Habermas refers both promises and apologies. Questions in the classification of J. Habermas belong to another group, these are communicatives. They explicate the content of the utterance qua utterance and are aimed at promoting mutual understanding between communicants. According to J. Habermas, they should be understandable to the addressee.

Thus, if we perceive the question as an incentive, it is impossible not to recognize that the question is an incentive to an informative answer, i.e., as E. K. Teplyakova rightly asserts, to verbal action [14]. Although, of course, the answer may be nonverbal, such as a negative or affirmative shaking of the head. A. M. Peshkovsky also wrote, "if we wish to influence our interlocutor with the thoughts we communicate, to act on his will, to encourage him to act one way or another, our speech can be called a motivational speech. The latter case is divided into two: we can encourage the listener to tell us what we do not know, to answer our question - the speech is interrogative, and we can encourage him to do exactly what we order him or ask for - the imperative speech" [15, 128].

With regard to the propositional content, we agree with D. Wunderlich that motives contain an indication of a causable action, and questions may not contain an indication of an answer.

As for the locative component, the questions differ significantly from other speech acts. So, in English, the question is marked with a certain word order and intonation, for example, the following question from the book by the American writer Jane Hazeldin "The Last Time She Saw Him", borrowed by us from the corpus of the American version of the English language on the https website:// corpus.byu.edu/coca:

(5) What are you talking about?

This question has a distinct structural and grammatical specificity. Unlike other statements in this statement (in question), the modifiable part of the verb are is in preposition with respect to the subject you, after the interrogative word What.

It should be noted that the question also differs from other acts of speech in illocutionary and perlocutionary components. The question (in comparison with other speech acts, including motivational ones) has a lack of information as an impulse. The realization of the speech act of the question is connected with the desire to make up for this ignorance, to learn something or to make sure of something. This is the illocutionary component of the question. In an effort to make up for ignorance, the initiator of the question tries to regulate the behavior of another subject by exercising communicative pressure, invading the personal sphere of the interlocutor in the process of achieving the goal. In this sense, questions are similar to motives, but the intention to encourage someone to perform some action aimed at changing the state of things in the world is different from the intention to get the necessary information that corresponds or does not correspond to the state of things in the world. Although, of course, there are some similarities in the perlocative effects of motives and questions. In the case of an incentive , this is is: 1) performing a causable action or 2) refusing to perform it, and in case of a question, this is: 1) the answer to the question or 2)

avoiding the answer, translating the conversation to another topic, references to ignorance, references to forgetfulness, omissions, etc.

As T. E. Yanko [16], E. P. Hidesheli [17] and other researchers rightly point out, the question (in addition to primary illocutions) may also have secondary illocutions that seem to "overlap" with the primary ones, such as surprise, bewilderment, irritation, reproach, indignation, pleading, indignation, etc. [16, 177].

In addition, questions can be used not only to request information, but also as indirect acts of speech. For example, R. Conrad notes the use of questions to express intentions to ask, advise, suggest, etc. [18].

Rhetorical questions, which are called "false" or "imaginary" due to the fact that they do not contain the actual request for information, but report on the state of affairs, still cause particular controversy [19]. The illocutionary power of rhetorical questions is the same as that of statements - to fix the speaker's responsibility for ensuring that his message truly reflects the current state of affairs.

Using the continuous sampling method, we selected about 1,000 questions from American films created over the past ten years. Questions containing a request for information made up 70% of the total body of interrogative statements. Such statements are accompanied by answers, evasions or references to ignorance on the part of the addressee of questions. Speech responses are accompanied by more than 2/3 of interrogative statements. Questions containing secondary illocutions (such as surprise, irritation, reproach, bewilderment, indignation or pleading) made up about 1/4 of all interrogative statements. For example, an excerpt from the movie "Love by the rules and without" ("Something's Gotta Give"), containing a conversation between the main characters Erica and Harry:

(6) Erika: So, Harry, what do you do?

Harry: I'm an owner of a record company...

In this case, Erica's interrogative statement contains a request for information, followed by Harry's answer.

Or, for example, from the movie "The Big Wedding" a dialogue between the former spouses of Ellie and Don:

(7) Allie: Don, Can you even hear what I'm saying?

Don: Not remotely...

In this case, Ellie asks a question with a request for information (i.e., she wants to know if Don hears her), and Don answers it, however, in addition to the primary illocution (the desire to find out if Don hears her) Ellie puts a secondary illocution into her question, namely irritation and reproach, which are expressed in the presence of the word even in the question and the corresponding intonation.

Rhetorical (i.e. false) questions made up only 10% of the total body of interrogative statements, for example, the question from the movie "Michael Clayton":

(8) How many times did I ask you to put me back on a litigation team?

The main character Michael Clayton uses a rhetorical question as a way to once again focus his boss's attention on the fact that he would have more success in court compared to the success he currently has as a lawyer for pre-trial dispute resolution.

Another example from the movie "Michael Clayton":

(9) I'm crazy, right?

This is the statement of lawyer Arthur, who realizes that his actions seem inadequate to his colleague Michael Clayton. However, Arthur utters this statement not in order to request information (to make sure from Michael that he is crazy), but in order to give himself a negative assessment, calling himself "crazy", to make Michael pay attention to his words and reflect on the fact that the information reported by Arthur can to be not the delirium of a crazy person, but the truth.

In turn, questions used not to request information, but as indirect acts of speech, made up 20% of the total corpus of interrogative statements. Most of these questions are used for suggestions and less often for advice. For example, from the movie "Premonition":

(10) Why don't you take the girls out for a while?

The main character Linda offers her husband to spend the weekend with the children and implements her intention not directly (for example, through an imperative), but indirectly in the form of a question.

Thus, questions should be considered a separate group of speech acts and distinguished from other speech acts by their locative, illocutionary, propositional and perlocutionary components. The results of the study of the question on the material of modern American films clearly demonstrate that most of the questions are used directly, i.e. to request information. About a quarter of them contain secondary illocutions. Questions as indirect acts of speech (mainly to express a sentence) are implemented only in 20% of statements. In turn, rhetorical (complex) questions make up only 10% of all interrogative statements.

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FUNDAMENTALS OF REGULATION OF THE COMPLEX CONTROL SYSTEM IN THE BANKING SYSTEM OF UZBEKISTAN

Abstract: *This article describes the ongoing work in the Republic of Uzbekistan to eliminate corruption in all spheres and industries. The goals and objectives of the normative legal acts adopted in our country to combat corruption have been studied. Scientific and practical proposals have been developed for the effective implementation of the compliance control system in the activities of commercial banks to combat corruption.*

Key words: *compliance control, banking system, corruption, anti-corruption, regulation, state and economic management, action strategy, economic security, crime prevention.*

Language: *English*

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Introduction

Currently, a number of measures are being taken in Uzbekistan to develop a system of compliance control in organizations in the fight against corruption. In particular, 4 draft laws, 1 draft presidential decree, 4 draft regulations and 10 internal regulations have been developed in this area. There is also a compliance control system in 26 ministries and departments. As a result of these efforts, our country has been recognized as one of the 16 countries that have demonstrated long-term positive dynamics. According to Transparency International's Corruption Perceptions Index, Uzbekistan has been steadily improving its position every year since 2010. In 2019, Uzbekistan was ranked 153rd out of 180 countries with 25 points, while in 2010 it was ranked 172nd with 16 points.

A number of normative and legal documents have been enacted to create a legal framework for the establishment of a compliance control system. The fact that the head of state pays special attention to the development of this sector is the most important factor in the development of this sector.

In particular, as stated in the Address of the President of the Republic of Uzbekistan to the Oliy Majlis of the Republic of Uzbekistan on January 24, 2020, "Corruption in our society in various forms hinders our development. "If we do not prevent this evil, we will not be able to create a real business and investment climate, and in general, no branch of society will develop." The president's public attention to the issue shows how stable the issue of eradicating corruption in public policy is.

As a result, a number of normative and legal documents have been enacted to establish the legal basis for the Compliance Supervision System.

Law of the Republic of Uzbekistan "On Combating Money Laundering, Financing of Terrorism and Financing of Proliferation of Weapons of Mass Destruction"

Law of the Republic of Uzbekistan "On joint-stock companies and protection of shareholders' rights";

Resolution of the President of the Republic of Uzbekistan No. PP-4075 of December 4, 2018 "On additional measures to increase the effectiveness of community security";

Decree of the President of the Republic of Uzbekistan No. PF-5992 of May 12, 2020 "On the Strategy of Banking System Reform of the Republic of Uzbekistan for 2020-2025"

Decree of the President of the Republic of Uzbekistan dated June 29, 2020 "On additional measures to improve the system of combating corruption in the Republic of Uzbekistan"

Decree PF-6019 "On additional measures to further develop the competitive environment and reduce state participation in the economy"

Internal Control Rules for Combating Money Laundering, Terrorism Financing and Weapons of Mass Destruction in Commercial Banks

Regulations on the minimum requirements for the activities of commercial banks in the implementation of relations with consumers of banking services

Figure 1. Legal basis for establishing a compliance control system in commercial banks

The Decree of the President of the Republic of Uzbekistan dated June 29, 2020 "On additional measures to improve the system of combating corruption in the Republic of Uzbekistan" is a practical confirmation of this. The document sets specific tasks for the systematic implementation of a number of reforms.

In particular, in 2020-2021, the task of step-by-step implementation of the system of internal control against corruption ("compliance control") in all state and economic administration bodies is firmly established. Analysis of foreign operations is one of the most important tools for ensuring the effective operation of public and private sector participants in the fight against corruption in market economies based on the rule of law. Because this approach organizes the activities of state and economic administration bodies, business entities in accordance with international standards in the field of combating corruption, laws and other regulations, the risks of corruption, conflicts of interest and conflicts of interest. is a prophylactic system that includes reporting violations.

The introduction of modern standards and methods of corporate governance in the strategy of further development of the economy of the country, the need to strengthen the role of shareholders in the strategic management of enterprises and the

organization of law enforcement, prevention and control of corruption It is no secret that increasing the effectiveness of anti-corruption measures will play an important role in solving this problem. In addition, at the January 11, 2020 meeting of the President of the Republic of Uzbekistan on combating corruption and improving public oversight systems, the Ministry of Internal Affairs and the Ministry of Internal Affairs task was set.

In this regard, the reforms being implemented in the country, such as amendments and additions to the Law on the Protection of the Rights of Joint Stock Companies and Shareholders, are mandatory. cancellation) is made by the general meeting of shareholders, the shares are listed on the stock exchange quotation sheet The establishment of an audit committee consisting only of members of the Supervisory Board, as well as the establishment of accountability of the company's internal audit service (if any) to this committee, are also important in improving the control system.

In the Law of the Republic of Uzbekistan "On Compliance and Control":

- In order to control the financial and economic activities of the company, the company is elected by the general meeting of shareholders for a period of one year, the qualification requirements for which are determined by the general meeting of shareholders. performs its duties in accordance with the law and the charter of the company, The audit of the financial and economic activity of the company is carried out at the initiative of the general meeting of shareholders, the company's supervisory board or at the request of the shareholder (shareholders) who owns at least five percent of the company's voting shares. the Audit Commission, which assesses the reliability of the information contained in the financial documents and analyzes the status of violations or non-compliance with the procedure for accounting and submission of financial statements;

Documents and documents submitted to the executive body, branches and representative offices of the company, which are accountable to the supervisory board, accountable to the company, which is formed in a company with a book value of assets of more than one hundred thousand times the minimum wage. ensuring full and reliable disclosure of information, compliance with established rules and procedures for conducting business operations,

protection of assets, as well as the company's internal audit service, which oversees the activities of the company's executive body, branches and representative offices by verifying and monitoring compliance with the requirements established by law; The auditing organization that carries out the audit of the company's financial and economic activities in accordance with the contract and provides it with an audit opinion.

PF-4947 of the President of the Republic of Uzbekistan dated 07.02.2017 "On the Strategy of actions for the further development of the Republic of Uzbekistan", Law of the Republic of Uzbekistan "On Joint Stock Companies and Shareholders" ., № ZRU-370, March 21, 2019).

In accordance with the Decree of the President of the Republic of Uzbekistan No. PF-5992 of May 12, 2020 "On the Strategy of Banking System Reform in the Republic of Uzbekistan for 2020-2025", one of the main directions of credit reform to pursue moderate growth, to pursue a balanced macroeconomic policy, to improve corporate governance and to involve managers with international experience, to implement financial and technological solutions for the assessment of financial risks.

In addition, the Decree sets the following tasks to improve the control mechanism of banks:

- revision of the regulatory and regulatory framework for establishing internationally recognized minimum standards and requirements for banks;

- development and approval of regulatory documents in accordance with the recommendations of the Basel Committee on Banking Supervision;

- Establishment of special committees under the supervisory boards for effective control;

- application of risk control;

- Continuous and systematic capacity building of employees involved in supervisory activities.

In addition, in accordance with the Decree of the President of the Republic of Uzbekistan dated July 6, 2020 "On additional measures to further develop the competitive environment and reduce state participation in the economy" from January 1, 2021 (as of January 1, 2021). The fact that the joint-stock commercial bank "Asaka" is included in the list of state-owned enterprises also indicates that it is time to prioritize the development of compliance and control systems in commercial banks of the country.

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SYNTAX CONSTRUCTIONS WITH GRAND PARTICIPLES

Abstract: *A comparative study of grammatical phenomena, in particular, gerunds, of the Russian and Uzbek languages is of great theoretical and practical importance, and also gives positive results in the assimilation of certain topics.*
Key words: *grammatical phenomena, syntactic construction, syntactic function gerund.*
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СИНТАКСИЧЕСКИЕ КОНСТРУКЦИИ С ДЕЕПРИЧАСТИЯМИ

Аннотация: *Сопоставительное изучение грамматических явлений, в частности, деепричастий, русского и узбекского языков имеет большое и теоретическое и практическое значения, а также даёт положительные результаты при усвоении тех или иных тем.*
Ключевые слова: *грамматические явления, синтаксическая конструкция, синтаксическая функция деепричастие.*

Введение

В современном русском литературном языке прямая речь с сопровождающими её авторскими словами образуют особую синтаксическую конструкцию. Поэтому в данной статье рассмотрим употребление русских деепричастий несовершенного вида в синтаксических конструкциях с прямой речью и узбекские эквиваленты этих конструкций.

В таких конструкциях авторские слова выступают как главная часть, а прямая речь «по значению приближается к дополнительному придаточному предложению» [2. с 126]. Основная масса деепричастий в предложениях с прямой речью употребляется в словах, т.е. в главной части этой особой синтаксической конструкции.

В предложениях с прямой речью деепричастие, употребляющиеся одиночно или с зависящими от него словами, чаще всего выполняет функцию второстепенного сказуемого, т.е. обозначает по отношению к главному побочное действие. В этой синтаксической функции деепричастие сохраняет все свойственные ему глагольные признаки. Так, в деепричастии отчётливо осознаётся значение времени, хотя оно не мыслится самостоятельно, как это бывает в исходных глагольных формах, а считается относительным: время деепричастия относится ко времени глагола-сказуемого, а не к моменту речи [3. с 28].

Общепризнанным в русской лингвистике считается три временных разновидности деепричастного действия [4. с 46]. В словах автора

в предложениях с прямой речью употребляются только две временные разновидности деепричастного действия: оно может протекать одновременно с главным или предшествовать ему. В связи с отсутствием в деепричастии такого важного глагольного признака, как изменяемость, значение времени в нём полностью сопряжено с категорией вида. Так, одновременность деепричастного действия с главным выражается деепричастием несовершенного вида (– *Бывают жесты красноречивее длинной речи, – расслабленно ответил Алёшин, поправляя носком ботинка дорожку…*), а предшествующее — деепричастием совершенного вида (- *Как, загремел Троекуров, вскочив с постели босой*).

Следует заметить, что деепричастия, употребляющиеся в обычной конструкции (в предложениях без прямой речи), в отличии от рассматриваемых могут иметь и некоторые другие временные отношения, например, деепричастие несовершенного вида может обозначать и значение предшествования (*Возвращаясь после задания, капитан старался избегать восторженных встреч.*) или последования (*Тогда десятки тонн расплавленного металла… заливают обширную площадь, преграждая путь людям, препятствуя работе печей.*)

Теперь, укажем способы передачи на узбекский язык русских деепричастий несовершенного вида, выполняющих в предложениях с прямой речью функцию второстепенного сказуемого.

А.А.Азизов отмечает, что «Значения русских деепричастий глаголов несовершенного и совершенного видов могут передаваться в узбекском языке деепричастиями прошедшего времени, образуемыми присоединением суффикса –(и)б к основе глаголов» [5. с 58].

Например:

— *Дай сюда деньги!...— рявкнул Челкаш, хватая Гаврилу за горло…(— Челкаш, Гавриланинг ёкасига ёпишиб, итдек ириллади: «Бер пулларни бу ёкка!»)*

— *Чего ты скулишь?– продолжал он, сбивая пальцемс её спины снег.(–Нега инграйсан?– деб суради у киши кули билан унинг устидаги корларни кокиб).*

Кроме того деепричастие на – и(б) в узбекском языке, передающее значение русских деепричастий несовершенного вида, может быть образовано и от основы глагола «настоящего конкретного времени (– ётир)» или от основы глагол, образованного при помощи деепричастия на – и(б) и «одного из четырёх глаголов: ўтирмок-сидеть, юрмок-ходить, турмок-стоять, ётмок-лежать».

Деепричастия иногда могут передаваться на узбекский язык формой деепричастия на – а. Эта форма в современном узбекском языке

«самостоятельно употребляется очень редко, она обычно встречается в удвоенном виде и в этом случае выражает длительность действия».

Например, – *Вот что скажи, – продолжал Никита, не выпуская из своих цепких пальцев руку Павла и приятельски – фамильярно потряхивая её, – ты Мишку не видал?(– Никита, Павелнинг кулини узинг чангалдек куллари билан махкам ушлаб, калин дустлардек, бетакаллуф силкита-силкита, сузида давом этди: «Сен менга шуни айт: Мишкани курдингми, йукми »)*

Рассматриваемые деепричастия нередко передаются на узбекский язык словами на –(а)р экан, –(а)ркан.

Например,

– *Что вы мне посоветуете? – спросил Надежда Сергеевна, продолжая смеяться (– Надежда Сергеевна хамон кулар экан: «Сиз кандай маслахат берасиз?» –деб суради).*

— *Та-ак! – зловеще измеряя лазами капитана, протянул Воронов (– Воронов газаб Билан капитанни кўздан кечираркан: «Шундай дегин!»– деди).*

Ср.: *продолжая (смеяться)– кулар экан, измеряя глазами – куздан кечираркан.* Форма на –(а) ркан с относящимися к ней словами в узбекском языке рассматривается как причастный оборот)2

Следует отметить, что слова на –(а)ркан по сравнению с деепричастиями на –(и)б точнее передают значения русских деепричастий, выражающих одновременное с основным побочное действие.

Если в русском языке к глаголу-сказуемому относятся несколько деепричастий, то для передачи одного из них (обычно последнего) в узбекском языке можно использовать глагол прошедшего категорического или многократно-длительного времени [8. с 72].

Например:

– *Эх ты!– зашептал он, усаживаясь рядом с Павлом и уж кстати толкая его кулаком в бок.(– Эх, сени!– Дея шипшиди у Павелнинг ёнига утираётиб унинг биқинига мушти билан туртиб хам куйди).*

Ср.: *(зашептал) усаживаясь.. и толкая в бок – (Дея шипшиди) ўтираётиб..биқинига туртиб қўйди.*

В отдельных случаях рассматриваемые деепричастия при переводе литературного произведения опускаются, например:

– *Эй ты, пёс, поди сюда!– сказал он, кладя матрасик в углу дивана.– Ложись здесь. Спи! (Хой, хуппак, бу ёкка кел. Бу ерда ёт.Ухла– деди.)*

Подобное явление, конечно, нежелательно при переводе художественных произведений, т.к. деепричастный оборот вводится авторами в предложение с целью обогащения стилистической и экспрессивной окраски высказывания.

Таким образом, на практике должны обратить внимание на то, что русские деепричастия несовершенного вида со значением одновременного с главным побочного действия, употребляющиеся в конструкциях с прямой речью, на узбекский язык могут передаваться по-разному в зависимости от семантики и стилистических целей. Для глубокого усвоения русских деепричастий может быть подобрано (с учётом вышеуказанных эквивалентов) несколько предложений при переводе на русский язык.

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FORMATION OF STUDENTS' LINGUISTIC COMPETENCE

Abstract: Today, with the rapid development of science and technology, the volume of many scientific knowledge, concepts and ideas is rapidly growing. This, on the one hand, ensures its differentiation through the development of new areas and sections of science and technology, and on the other hand, creates a process of integration between the sciences.

Key words: linguistic competence, concept, representation, differentiation. The process of integration between sciences.

Language: Russian

ФОРМИРОВАНИЕ ЛИНГВИСТИЧЕСКОЙ КОМПЕТЕНЦИИ СТУДЕНТОВ

Аннотация: Сегодня, с бурным развитием науки и техники, быстро растет объем многих научных знаний, концепций и представлений. Это, с одной стороны, обеспечивает ее дифференциацию за счет развития новых областей и разделов науки и техники, а с другой стороны, создает процесс интеграции между науками.

Ключевые слова: лингвистическая компетенция, концепция, представление, дифференциация. Процесс интеграции между науками.

Введение

В связи с этим растет потребность в высококвалифицированных педагогах, способных воспитать гармонично развитое поколение в духе формировавшихся веками общечеловеческих и национальных ценностей, овладеть основами науки, педагогики и психологии, иметь высокий уровень профессионализма и применение современных педагогических и информационных технологий, требуется подготовка творческих педагогов с навыками и квалификацией.

Широкое использование педагогических инноваций в образовательном процессе является глобальной тенденцией мирового развития.

Формирование и развитие профессиональной подготовки студентов педагогических высших учебных заведений требует системного, комплексного подхода к этому процессу [2. с 155]. Способность будущего специалиста иметь глубокие знания, умение эффективно работать зависит от того, в какой степени он обладает достаточными теоретическими и практическими знаниями основ науки, умением эффективно использовать инновации в образовательном процессе.

На уроках русского языка учащиеся обычно говорят на нескольких языках и изучают язык, живя в своей стране [3. с 88]. Они не имеют

достаточных возможностей для изучения культуры изучаемого языка и развития своей лингвокультурной компетенции.

Цель изучающих русский язык состоит не только в том, чтобы говорить на изучаемом языке с носителями русского языка, но и в том, чтобы использовать русский язык в качестве международного. Студент с большим желанием пройти курс языка может иметь низкую коммуникативную способность (способности), даже если он или она хорошо разбирается в правилах грамматики [4. с 119]. Это связано с тем, что иностранный язык рассматривается как языковая система, а не как средство общения. Соблюдение грамматических правил не очень важно в процессе обучения иностранному языку. В процессе свободного выражения мыслей больший упор делается на правильное изложение учащимся содержания, а не на грамматическую грамотность. Достижение формирования у студентов лингвокультурной компетенции стало неотъемлемой частью процесса формирования личности студента; он включает в себя способность человека выучить иностранный язык, а также его или ее способность к общению. Изучение иностранного языка позволило отличить одну культуру от другой.

Также изучение средств и форм речи, связанных с повседневными жизненными ситуациями, приводит к осознанному пониманию собственной культуры. Важную роль в этом играет формирование у учащихся умения сравнивать культуры. Они должны сначала научиться не спешить оценивать непонятные ситуации и события в другой культуре на основе собственных культурных норм [5. с 28]. Сравнение культур заключается не в оценке «хорошего» или «плохого» (на основе критериев), а в понимании и осмыслении различий. Одной из следующих целей обучения иностранному языку является развитие способности понимать представителя другой культуры.

Эта концепция подчеркивает эффективное применение межкультурного подхода, который помогает развивать лингвокультурную компетенцию наряду с изучением языка на уроках иностранного языка и предотвращать смущение в будущем в реальной жизни.

М. Байрам определил концепцию культурного образования при изучении иностранных языков и создал модель обучения иностранному языку и культуре. По его словам, «обучение иностранному языку должно включать ключевые компоненты, включая изучение языка, языковые навыки, культурное понимание и культурный опыт». Он объединяет родной язык учащихся и иностранный язык посредством сравнительного анализа и нового культурного опыта, чтобы обеспечить комплексный подход к преподаванию и обучению языку и культуре.

Согласно К. Крамшу, преподавание культуры на иностранном языке происходит по двум основным направлениям: одно посвящено культурной информации, статистике, институциональным структурам и фактам цивилизации. Классика литературы и искусства, торговая информация, еда, ярмарки и фольклор повседневного быта, последний включает в себя процессы, производные от культурной психологии или культурной антропологии, универсальные категории человеческого поведения, процессы понимания иноязычных реалий.

Обобщая вышеизложенные теории, Шэнь Чен предположил, что изучение иностранного языка является попыткой найти выход через трудности для развития лингвокультурной компетенции учащихся.

В этом процессе студенты знакомятся с новыми знаниями и новым культурным опытом на практике.

Культурный опыт включает в себя:

1. Традиции. Привычки и традиции в быту и в общении речевого сообщества. К ним относятся приветствия, поздравления, благодарности, извинения и многое другое.

В нашей восточной культуре при приветствии собеседнику обычно задают вопросы: здоров ли ты?, здоровы ли твои дети?, куда ты идешь?, ешь ли ты?, сколько ты зарабатываешь? Однако подобные вопросы вызывают у жителей Европейских стран не что иное, как смущение, и даже такие вопросы могут их разозлить [7. с 45]. Мы должны помнить, что жители этих стран сохраняют конфиденциальность своей информации. Наоборот, они обычно здороваются друг с другом по утрам, говоря о хорошем дне, погоде и так далее.

Социальный строй разных народов, несовместимость в нравственном аспекте, требует усвоения культурных понятий.

Жители Европы также регулярно звонят хозяину, чтобы убедиться, что визиты гостей комфортны и удобны. Они сигнализируют, что уйдут примерно за четверть или двадцать минут до ухода гостя. Затем за ним следует хозяин, но уже у дверей. В нашем случае визит нежданных гостей довольно частый и просить гостя уйти невежливо, а если гость хочет уйти, то он может долго его сопровождать (все члены семьи вместе) добираться на такси из далеко или оставить машину дома — это одно, и можно с уверенностью сказать, что это явление свойственно только нашему скромному народу.

2. Психология. Психология наций может быть разной, потому что национальные

нравственные ценности являются важнейшим средством выражения культуры.

3. Историческая справка. Включает в себя историческое развитие культуры.

Литература той или иной страны обычно является хорошим выражением ее культуры. Читая произведения определенной публики, студенты могут начать ценить работу, а также знакомиться с культурой этой страны. Фильмы, видео, песни, стихи, образцы искусства, мультфильмы и другие электронные носители могут напрямую и эффективно знакомить студентов с традициями и ценностями культуры страны, где изучается язык.

Анализ и сравнение. Анализируя и сравнивая разные культуры, учащиеся могут целенаправленно лучше понять культуру. Межкультурный подход предполагает, что к изучению языка можно подходить по-разному и что оно должно быть сосредоточено на развитии жизненно важных знаний и навыков. Хорошее изучение языка требует от студентов знания изучаемой языковой культуры. Знание языка, но незнание культуры носителей этого языка может привести к некоторым неловким ситуациям, как упоминалось выше, при разговоре. Студенты, изучающие русский язык, должны хорошо знать различные мировые культуры и иметь возможность сравнивать свои собственные культуры на основе этих знаний.

Кроме того, он служит для того, чтобы студенты могли свободно применять знания, навыки и умения, полученные на иностранном языке, в профессиональной и научной деятельности. Основной задачей межкультурного подхода является интеграция обучения и развития коммуникативных навыков, необходимых

учащимся для овладения изучаемым иностранным языком на высоком уровне в соответствии с общепринятыми международными стандартами.

Лингвокультурная компетенция, интернациональная культурная компетентность, значение различий культур в изучении и преподавании языков, экстралингвистические особенности лингвокультурной компетенции (мировоззрение, ритуалы, обычаи, человеческий язык (жесты), табу, стереотипы, мультикультурализм). Адекватное использование культурных особенностей (приветствия, способы выражения услуги, способы обращения, идиомы и др.) в формировании лингвокультурной компетенции, создании методических материалов для обучения аспектам иноязычной культуры, анализу имеющихся, адаптационных умений.

Такие уроки требуют максимального использования личностно-ориентированного метода обучения и коммуникативного подхода к обучению языку. Помимо учебников и пособий, на уроках широко используются аутентичные материалы: аудио, видео, газеты и журналы, интернет-ресурсы, мозговой штурм с использованием интерактивных методов, тематические исследования, подготовка проектов, ролевые игры, дебаты и презентации.

В заключение отметим, что одним из важнейших направлений развития иноязычного образования является использование подходов, основанных на развитии у студентов коммуникативных навыков, культурно-социальных и информационных компетенций на иностранных языках и развитии навыков и умений применять их на практике. Особое значение имеет также развитие знаний.

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THE INTERACTION OF ENERGY WITH CLIMATE CHANGE

Abstract: The article substantiates the problems of the energy of fossil resources underground, which are changing the climate and causing global warming throughout the planet, and solving these problems by means of energy efficiency and the transition to clean energy.
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Introduction

The global climate is changing and these ecosystems pose an increasingly serious threat to human health and the economy. Recent research suggests that Central Asia is also facing climate change, including sandstorms, extreme weather events, droughts and magnetic storms.

These changes are due to the activities of many people in Central Asia, including, most importantly, the release of large amounts of greenhouse gases into the atmosphere as a result of burning fossil fuels for electricity generation, heating and transportation. Combustion of fossil fuels releases pollutants that are harmful to the environment and human health.

Energy use is the largest source of greenhouse gas emissions from human activities. About two-thirds of greenhouse gas emissions are related to the combustion of fossil fuels for heat, electricity, transportation and industrial energy[1].

The greenhouse effect is the heating of the lower layers of the Earth's atmosphere as a result of an increase in the concentration of certain gases in it. In the greenhouse effect, the sun's rays heat the Earth's surface, and at the same time the heat is retained on the planet and cannot be returned to space. Greenhouse gases prevent this. As a result of these processes, the temperature of the planet rises [2].

Greenhouse gases mainly include the following gases:

Carbon dioxide:

This gas is produced by burning fuels, such as oil and gas, which release carbon into the atmosphere, as well as other industrial processes [3].

Methane:
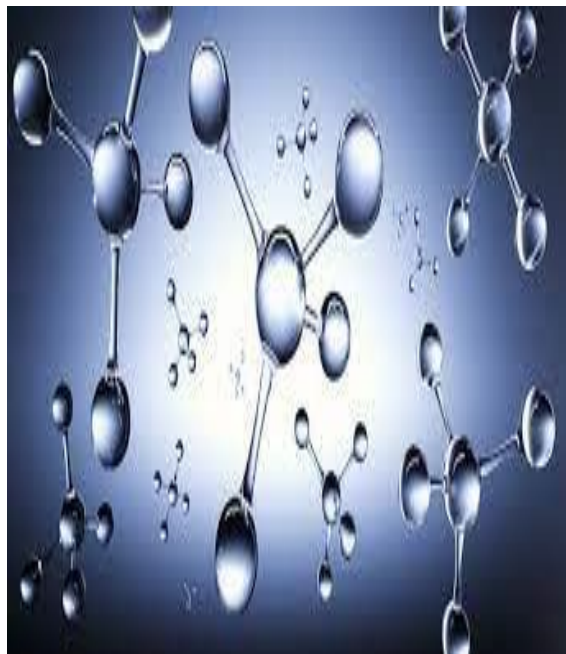
Methane is mainly produced in agricultural processes, such as livestock, because animals produce a lot of methane during digestion and in manure [4].

Nitric oxide:
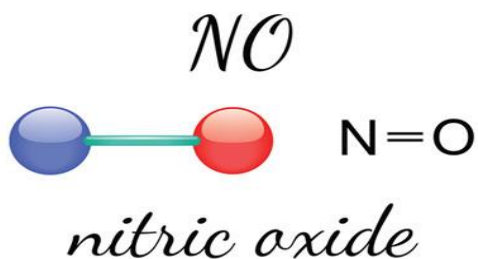
The use of fertilizers for large-scale agricultural production produces large amounts of nitrogen oxides [5].

Water vapor:

Water vapor (H_2O) has the ability to absorb infrared radiation from the atmosphere.

Ozone:

Fluorine compounds (chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride):

There are two types of ozone: the first type is formed naturally at high levels in the atmosphere due to the fission of oxygen atoms by infrared radiation; the second type is produced by internal combustion engines and power plants that produce volatile organic compounds and nitrogen gases [6].

Some of these compounds are produced as by-products of industrial processes, such as aluminum production, while some fluorine gases are produced specifically for use in products and processes.

In fact, energy-related greenhouse gas emissions can be reduced in two ways: by choosing clean energy sources, for example, by replacing fossil fuels with non-combustible, renewable sources, and by saving energy and through it reduction of total energy consumption.

To avoid the worst consequences of climate change, we need to make these changes long before we run out of fossil fuels. The more greenhouse gases we emit into the atmosphere, the less likely we are to limit the harmful effects of climate change. In this regard, increasing the production of renewable energy from solar and wind energy has played an important role [7].

Power generation often requires large sums of money, and once a power plant is commissioned, it is expected to last for decades. Investments in traditional polluting technologies are slowing the transition to clean energy. Such views could delay energy capacity and resources for decades, making it difficult to come up with new solutions [8].

For example, continuous investment in transport infrastructure based on fossil fuels, climate change mitigation, noise reduction, and ultimately the transition to sustainable modes of transport that are essential for improving people's quality of life. will be a setback for. Climate change based on a rise in temperature from 6.3 to 9 °F could increase the need for additional power generation capacity by about 10-20% by 2050. That would require hundreds of billions of dollars in additional investment [9].

A warmer climate could reduce energy production efficiency for many fossil fuels and nuclear power factories, as these plants use water for cooling. The colder the water, the more efficient the generator. Thus, high air and water temperatures can

reduce the efficiency of converting the fuel of these plants into electricity.

Reducing food waste, increasing urban horticulture, improving supply chains, and increasing the number of solar-powered devices may seem like small parts of the big problem, but together they can pave the way for how innovative technologies and practices can emerge and change sustainability more broadly.

Mankind has faced climate change several times. They have also been one of the driving forces behind historical development. Today we know all the factors that lead to the accumulation of greenhouse gases and rising temperatures. It will be very difficult to change the current trend, as it will require the efforts of all mankind and a radical reconstruction of the world economy. To do this, we need to understand that the greenhouse effect is a global problem that threatens not just all countries, but all people [10].

Summary and Suggestions

In short, we need to take the following measures to avoid the greenhouse effect in the future:

- Reducing the use of fossil fuels and switching to renewable energy sources. Today, the main sources of CO_2 are fossil fuels: oil, coal and gas. To reduce them, humanity needs to switch to renewable energy: solar and wind energy. Their share in the overall balance sheet has been growing rapidly in recent years, but these figures are not enough;

- Improving energy efficiency and modernizing industries with energy-saving technologies. Improving energy efficiency, this applies to industrial production and energy production, housing and communal services. The energy density of the products should be significantly

reduced. We need new technologies that do not harm the environment;

- Increase greenery in nature, prevent forest fires, increase afforestation, stop the destruction of forests by wild animals;
- Transition to eco-friendly agriculture;
- Preservation of organic matter in the soil (because their loss directly affects the greenhouse effect);

- It is necessary to switch to environmentally friendly modes of transport and to stop using cars with internal combustion engines;
- A very effective way to combat the effects of greenhouses is to reduce waste. It is necessary to study the secondary use of resources, which eliminates or at least reduces the volume of methane-containing wastes.

All of the above requires billions of dollars of investment and decades of hard work. But we need to start today, now!

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Issue   Article

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LEARNING RUSSIAN LANGUAGE VIA BROADCASTING

Abstract: In learning and perceiving a language at once cannot be reachable as it needs more attempts and skills, knowledge to put on. Furthermore, any language could be displayed on the TV programs to spread updated news around the world, informing the population, also indigenous people in rural areas whereas satellite can be reached. Besides, excessive TV watching allows all age groups of people to be familiar with the life existing other regions of the globe. However, if they do not know the language of that region which is broadcasting on TV, they will not comprehend the issues going on TV programs, that's why, listeners should know foreign languages. One of the widely spoken foreign languages is Russian one. This paper highlights the issues concerning teaching and acquiring Russian language via TV programs and its benefit to gain.

Key words: teaching and learning Russian language, TV programs.
Language: English
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Introduction

In teaching and learning a language, especially, Russian one, a learner encounters with much difficulties in having insufficient knowledge due to not knowing that language at all. Consequently, language requires a log-term learning rather than short one because young listeners should firstly acquire the technical vocabulary with broadened exercises to perform. Besides, Russian language is complicated to pronounce because of unregularly letters which is not found in other alphabets. Engineering students use a wide range of technical vocabulary characterizing the specialty in that field of study and they need to gain that vocabulary words in order to communicate in spoken and written forms in the specific settings. In this paper, we broadly make some analysis in accepting different possible methods in acquiring Russian language via broadcasting on TV or by radio or by telecommunication platforms.

The advantageous of broadcasting in learning Russian language

Russian language originated from Slavonic one and there are some similarities among Slavonic languages. Their formation is the same as Polish, Slovak and Check languages and which is why inhabitants living in these regions may easily comprehend these languages which are portrayed on TV, radio and show programs. According to some scientists, language cannot be gained at once as we expect it to learn through culture of that nation but it demands a lot of knowledge resources to understand: as learning a foreign language many difficulties appear due to the so-called interference. The nature of this phenomenon is a perception of the units of a foreign language through a native language and culture which can lead to misunderstanding (Gasek, 2010). Significant number of mistakes is caused by a phonetic similarity of Russian words and the words of the students' native language. The Risk of misinterpretation of words almost identical in their form and sound but different in meaning, always exists, but in teaching a related language it doubles. That is why a teacher of Russian as a foreign language needs to develop such methodological techniques that would promote not only understanding of Russian

words similar to those in the students' native language, but also to determine the main areas of work with such lexemes in Russian classes. In this case a teacher has to skillfully use their knowledge of Comparative Lexicology and Semasiology which investigates similar microsystems in two related languages. What's more, some scholars also indicated some statements according to learning Russian language: words that sound similar in related languages are known under various names in theoretical literature "false friends" (Budagov, 1974), "interlingual homonyms", "deceptive interlingual similarities" (Grosbart, 1984), "interlingual paronyms" (Balalykina, 1988), etc. According to N.V.Krushevsky, such processes are explained by the fact, that language can never have as many words, as required to name the infinite, always changing and increasing mass of concepts (1998).

There are a wide range of choices to learn Russian language
- Via social platforms: face book, telegram, Instagram, tik-tok and twitter
- Via TV programs: Russian channel (1st, NTV, Domashniy TV, and others)
- Via Radio
- Via different shows
- Via musical platforms

These platforms not only enhance the knowledge of learners in Russian language but it also develops their interpersonal traits and skills to socialize with population in that communication.

Multi-functioning in audiovisuals

Some researchers (Teng, 2021; Vanderplank, 2016, Montero Perez, Peters, Clarebout, & Desmet,

2014; Teng, 2019a,b) made a huge contribution to audiovisual input supported by captions or second language (L2) on-screen text and their attention was given to incidental vocabulary learning. Additionally, according to the statement indicated by Teng and Zhang (2021) a short-term phonological memory and complex working memory impact learners' vocabulary learning through multimedia input and they suggested that learners' proficiency level may influence incidental vocabulary learning from captioned audiovisual material. Besides, the effects of learners' L2 proficiency level and language aptitude on incidental vocabulary learning from captioned videos remain unclear. The L2 proficiency level, conceptualized as one's overall L2 competence in terms of organizational and pragmatic knowledge, may affect the mechanism of multimedia/multimodal learning. Learners in the present study viewed an original TV documentary. Moreover, radio is also one of the broadly broadcasting, and news spreading platform which fast conveys or delivers any information to listeners or citizens without any barriers: time and place. We can listen to any radio telecommunications from every corner of the globe, being aware of events happening on the earth.

Data Analysis

The thirty learners were invited for the interview to be directly requested with the assistance of questionnaire consisted of 5 closed questions concerning the issues focused on learning Russian language through digital world such as TV, radio and social platforms, and other channels, music platforms. Their respond was following:
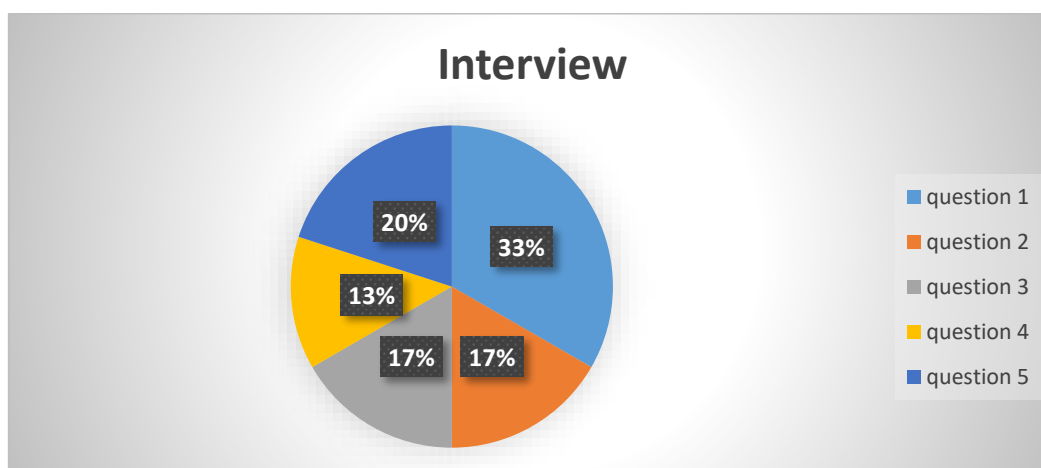
Pic.1

According the results of the survey carried out in the research showed in the above-mentioned diagram. 33% of learners agree that excessive TV watching enhance listening comprehension, especially, Russian language. 20% of respondents were sure that social

media platforms are very supportive and helpful in proving them needful materials or news which increase their knowledge in Russian one. 17 % of students in the sphere of petroleum engineering found radio telecommunication broadcasting and music

useful in comprehending a language better than other resources. 13% of adult learners stated that they were sure that they could improve their language comprehension and horizons in knowledge through internet channel programs such as documentaries depicting culture, cuisine.

Conclusion

In acquiring and realizing any language, a learner should use all audio video platforms because in this way of learning allows him/her of how to improve their knowledge in vocabulary and in phonetics how to pronounce exactly as native-speakers. Furthermore, video data portrays essential episodes those may change learners not only language knowledge but also their traits, except that, they could increase linguistic skills of them.

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Issue   **Article**

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FEATURES OF ECONOMIC FORECASTING OF THE PERSONNEL COMPONENT OF INTELLECTUAL CAPITAL

Abstract: *The article analyzes the features of forecasting development prospects, as well as substantiates the conclusions on optimizing the structure and developing a model for the balanced functioning of the structures and links of the personnel component of intellectual capital, which guarantees the effective functioning of each of the five components and intellectual capital as a whole.*

Key words: *Intellectual capital, economic forecast, personnel component of intellectual capital, optimization of the structure of the personnel component of intellectual capital, the model of balancing the personnel component of intellectual capital.*

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Scopus ASCC: 2000.

Introduction

In the conditions of the formation and development of market relations, it is of particular importance to determine the optimal structure of intellectual labor workers and the pace of their training for the future - forecasting the need for scientific personnel and specialists.

Indeed, the task of joining the Republic of Uzbekistan among the 50 most competitive countries in the world can be solved if the country has highly qualified specialists with knowledge of high-tech technologies, managerial skills, who are able to navigate in a market economy [1].

Literature review

In the economic literature, there are various approaches to the definition of the concept of "economic forecast". With regard to intellectual capital, the economic forecast of its development should be understood as a scientifically based set of reasoned scientific ideas about the priority directions of the development of the components of intellectual capital as a system, including: justification of the most likely directions of the dynamics of changes in the system of scientific knowledge and the specifics of their application in the field of material production,

taking into account the trends of the world process of scientific and technological development; development of alternative options for the development of intellectual capital components, ensuring the priority development of the most relevant areas of scientific and technological progress, guaranteeing, based on available economic resources, stable positions of the republic's economy in regional and global markets.

Analysis

As the conducted research has shown, the process of forecasting the prospects for the development of the personnel component of intellectual capital has a number of features:

-firstly, the accuracy of the forecast is significantly reduced due to the long duration of training of intellectual workers of various qualifications (from 5 to 12 years), as well as the intensification of the process of moral aging of knowledge;

-secondly, the process of intellectual work itself, primarily on the creation of new knowledge, is a creative process with unpredictable results, which increases the degree of uncertainty and probability of

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the development of the system of the scientific fund of the society;

-thirdly, intellectual labor workers should be considered in two organically interrelated aspects: on the one hand, they act as the most important component of the productive forces, whose activities are aimed at the qualitative renewal of the entire production process and products, and on the other - like all other components of labor resources, they are the goal of production, for comprehensive and the harmonious development of which the entire reproductive process should be directed, which increases the importance of the relationship between personnel and socio-informational components;

-fourth, in modern conditions, the flow of scientific and technical information is increasing significantly, but an increase in the amount of scientific information does not lead to an improvement in its quality, which makes it much more difficult to find the necessary information;

-Fifthly, the mechanism of professional mobility of intellectual labor workers studying the processes occurring at the "junctions" of sciences, as well as in connection with the expanding use of computer technology and other high-performance means of intellectual labor in the field of intellectual activity, the cost of which increases significantly due to the limited subsequent use, etc., has not been fully studied.

Currently, more than 100 methods of scientific, technical and economic forecasting are known [2].

The most commonly used forecasting methods can be grouped into the following main groups:

- Normative methods, including methods of standards: saturation; number; nomenclature of positions, etc.

- Methods of extrapolation of development trends, including methods of analogy and comparison.

- Correlation and regression methods.

- Methods of economic and mathematical modeling.

- Methods of expert assessments.

Discussion

A common disadvantage of the methods used is the lack of a systematic approach to determining the need for specialists, which does not allow a scientific analysis of the influence of a large number of factors on the change in the need for workers of various qualifications.

Almost all developed forecasting methods are industry-specific, not taking into account territorial features, demographic trends, etc.

Regression-correlation models can be considered the most acceptable for predicting the balanced development of all components of intellectual potential on the scale of a sovereign republic or a single region.

At the same time, the regression-correlation model provides a detailed development of the forecast of the development of the components of intellectual capital, the more accurately the number of factors included in it and the more reliable the initial information.

However, the possibilities of even the most advanced models should not be overestimated, because they are based on extrapolation of those conditions that have developed in the past and present, and not in the future [3].

As the conducted research has shown, the optimization of the structure of its personnel component has the most significant impact on the final balance of all components of intellectual capital. In this regard, the priority direction of forecasting the structure of intellectual capital as a whole is the justification of rational relations in the development of qualification and other groups of employees who are part of its personnel component.

Moreover, it is advisable to start forecasting the structure of the personnel component of intellectual capital by comparing the degree of influence of the main ratios of the development of qualification groups of the personnel component on other components of intellectual capital and, conversely, taking into account the level of influence of each of the components on the structure of intellectual labor workers.

In addition, the starting position in the search for ways to scientifically substantiate methods for determining the needs of science and production in intellectual labor workers should be, along with an indicator of the saturation of these industries with highly qualified researchers, a clear definition of the functions performed by each intellectual labor worker, the volume and ratio of which are determined by the content of the relevant stages of the scientific and production cycle, the justification of intellectual labor standards and indicators of its evaluation for each development of a scientific idea up to its implementation into mass production.

As a basis for choosing a forecasting method, it is also advisable to use the scientific and technical level of the intellectual labor workplace system, which unites all stages of the development of a scientific idea. The main factor features affecting the complexity of the assessment of the workplace system are:

- the set of functional responsibilities of the researcher, developer, experimenter, etc., required for the most effective use of appropriate means of intellectual labor;

- the socially necessary degree of the personnel's capital equipment with the appropriate scientific and technical level of the means of intellectual labor;

- physiologically permissible intensity of the norms of intellectual activity, including with the use

of computer technology and other high-performance means of intellectual labor [4].

Thus, managing the structure of intellectual labor workers at the present stage of socio-economic development of the republic's economy and determining the needs (forecast) for them in the future means ensuring rational proportions in the number and forms of functional interrelation between intellectual labor workers of various specialties, qualifications and activity profiles both for the economy of the republic as a whole and for any subject management separately.

In the conditions of the formation and gradual development of the mechanism of market relations, the development of a model of balanced functioning of the structural units of the personnel component of intellectual capital, which guarantees the effective functioning of each of the 5 components, and intellectual capital as a whole, is of particular relevance. At the same time, the main goal of the model is the desire to calculate the structure of intellectual labor workers optimal for a given level of development of productive forces for scientific, design, technological and production units of a particular enterprise, association, and other business entities of various forms of ownership.

Conclusion

In our opinion, this model should so link the main proportions between the professional and qualification organizational and demographic characteristics of intellectual labor workers, so that, having set the main indicators - the production program, volume, as well as output per worker and taking into account the specifics of the relevant branch of the economy, it would be possible to recommend quantitative guidelines for the numerical composition of all qualification groups.

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Issue   **Article**

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THE STUDYING OF APPLICATION OF SALSOLA OPPOSITIFOLIA EXTRACT IN 0.5 M L OF SULFURIC ACID AS A GREEN INHIBITOR FOR CORROSION OF CARBON STEEL

Abstract: In recent years, we can see that in the protection of metals from corrosion, effective results are obtained using not only corrosion inhibitors synthesized by chemical methods, but also extracts from various parts of plants. In this article, research has been conducted on obtaining an eco-friendly inhibitor and its application in practice. The source of the green inhibitor was the Salsola oppositifolia plant, from which the method of obtaining the green inhibitor extract and extrareagents were studied. The obtained extract was studied as a green inhibitor in 0.5 M H_2SO_4 solution for corrosion protection of carbon steel structures. In determining the efficacy of a green inhibitor derived from the salsola oppositifolia plant, practical experiments were performed at two different temperatures (298 K and 313 K) and at different concentrations (200 mg / l, 400 mg / l, 600 mg / l, and 1000 mg / l). Adsorption of Green inhibitor on steel surface was studied using Langmuir and Temkin isotherms.

The effect of temperature and concentration on the corrosion rate was also studied. The gravimetric method was used to determine the effectiveness of the green inhibitor and it was found that its maximum concentration was 91.86%. The mechanism of action of the Green inhibitor on the steel surface and a post-experimental steel sample were studied by SEM analysis. Salsola oppositifolia plant extract contains a number of flavonoids, iso flavonoids (isorhamnetin-3-O-glucoside and isorhamnetin-3-O-rutinoside), organic acids (Methyl palmitate, palmitic acid, Linoleic acid, linoleic acid). 2-hydroxy-1- (hydroxymethyl) ethyl ester) and tetrahydroisoquinoline.

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Salsola oppositifolia extract is a good green inhibitor due to the presence of hetero atomic organic compounds in the main component.

Key words: *Salsola oppositifolia, green inhibitor, Langmuir izotermasi, Temkin isotherm, H₂SO₄.*

Introduction

It is difficult to imagine our modern world without industry, because many manufacturing enterprises are required to meet the needs of mankind. It is no secret that all types of industrial equipment are made of steel. Such steel structures operate in various acidic conditions, which can seriously damage the stability of steel structures, as well as lead to serious economic losses [1]. At present, inorganic and organic substances are used in many industrial enterprises to prolong the stability of steel structures and increase their economic efficiency, inhibitors are used. It should be noted that many of the synthesized corrosion inhibitors are harmful to the environment, and also that the cost of such inhibitors is high. In recent years, there has been increased interest in environmentally friendly products in order to protect the environment from pollution by waste and toxins. For example, green inhibitors are not only environmentally friendly, but also much cheaper than chemically synthesized inhibitors [2,3]. Most of the known organic inhibitors consist of heteroatomic compounds that retain the elements N, O, S, P and functional groups based on them, such as NH, NH_2, C=O, OH, COOH, and CHO. The electrons in these heteroaomic compounds form a bond with the free d-orbitals of iron atoms on the steel surface based on the electron-donor-acceptor mechanism. As a result, it blocks the activity of the iron atom due to functional groups in the organic heteroatomic molecule and significantly reduces the degree of corrosion [4–6]. The extract of leaves, stems, fruits, roots and seeds of many plants was used as a green inhibitor. For example: Salvia officinalis extract 96% efficiency at

2500mg/L [7], Osmanthus fragran extract at 340mg/L, 94% suppression efficiency [8], Musa paradisiac extract at 300mg/L, 90% suppression efficiency [9], Mangrove tannins trees 89% at 6000 mg/L [10], 92% at 1000 mg/L Jasminum nudiflorum extract [11], 92% at 1200 mg/L Lawsonia inermis extract [12], 90 % at 1000 mg/l, Dendrocalamus brandisii extract [13], Kola nitida extract at 1200 mg/l at 78% [14], Murraya koenigii extract at 600 mg/l showed 96% inhibitory efficacy [15] .

Studies have shown that plants are composed of complex organic compounds: tannins, alkaloids, amino acids, proteins and flavonoids. In turn, such substances contain different polar functional groups and bonds. Salsola oppositifolia plant extract is used in medicine as a drug for such diseases as antitumor, hypotensive, diuretic, emollient, laxative, antiulcer, and anti-inflammatory [16–18]. Salsola oppositifolia plant extract contains a number of flavonoids, isoflavonoids (isoramnetin-3-O-glucoside and isorhamnetin-3-O-rutinoside), organic acids (methyl palmitate, palmitic acid, linoleic acid, linoleic acid-2).-hydroxy-1-(hydroxymethyl) ethyl ester) and tetrahydroisoquinoline [19].

This article was the first to study the use of Salsola oppositifolia extract as a green inhibitor in 0.5 M H_2SO_4 solution.

EXPERIMENTAL PART

Sample preparation. The composition of the steel obtained for practical experiments is as follows: Steel st20 in accordance with GOST 1050-88 steel grade 20 refers to carbon structural alloys [3; c 761-768] and contains the elements shown in Table 1.

Table 1. Chemical composition in% steel 20 GOST 1050–88

Fe	C	Si	Mn	Ni	S	P	Cr	Cu	As
97,755-97,215	0,17-0,24	0,17-0,37	0,35-0,65	till 0,3	till 0,04	till 0,035	till 0,25	till 0,3	till 0,08

In many ways, the performance of the metal depends on the concentration of carbon, since with an increase in its concentration, the hardness and brittleness of the material increase. According to these indicators, grade 20 steel is classified as "quality structural carbon steel". It is used in the machine-

building field to create plain bearings, pipes, shafts and many other products.

Corrosion tests, electrochemical and capacitive measurements were carried out on samples of steel St2 with composition, wt. %: C - 0.2; Mn - 0.5; Si - 0.15; P - 0.04; S - 0.05; Cr - 0.30; Ni - 0.20; Cu - 0.20; Fe - 98.36.

A sample of size (0,19625 sm^2) was taken and its mass loss was examined gravimetrically.

These specimens were sanded with 100, 200, 500, 1000 and 1500 grade sandpaper, rinsed and degreased with acetone and distilled water prior to testing. For the experiment, it was tested in a 0.5 M solution of H$_2$SO$_4$.

Preparation of Salsola oppositifolia extract. Annual sprigs of the aerial stem of Salsola oppositifolia are stored and dried in a dark place for 3-5 days. 100 g dry sample is ground to a powder and mixed with 300 ml methanol in a 0.5 liter flat-bottomed flask at 50°C, incubated for 12 hours. The resulting mixture is filtered, the methanol in the filtrate is dried in vacuum at a temperature of 52-53°C. The mass of the remaining dry residue was 5.84 grams.

For practical experiments, solutions with a concentration of 200, 400, 600 and 1000 mg/L were prepared.

Gravimetric method and inhibitor efficiency. A steel sample of size (0,19625 sm^2) was used for a practical experiment based on mass loss.

Practical experiments were carried out in a solution of Salsola oppositifolia extract at various concentrations with the addition of 0.5 M sulfuric acid solution and at different temperatures. Corrosion rate (1) and efficiency (2) were determined by the following equations.

$$C_R = \frac{W_b - W_a}{At} \quad (1)$$

$$\eta(\%) = \frac{C_{R(blank)} - C_{R(inhibitor)}}{C_{R(blank)}} \quad (2)$$

Where: C$_{R(blank)}$-- corrosion rate, W$_b$- metal sample weight, untill experiment, W$_a$- the weight of the metal sample after the experiment, A surface area of the sample taken, t- time spent on the practical experiment, hour.

C$_{R(blank)}$- corrosion rate without inhibitor, C$_{R(inhibitor)}$ - corrosion rate with inhibitor.

RESULTS AND ITS DISCUSSION

Weight loss measurements. The inhibitory efficiency (η%) and the corrosion rate of the Salsola oppositifolia extract were determined at different temperatures and different concentrations. The results show that as the concentration of the inhibitor increases, so does the effectiveness of the inhibitor (Table 2).

Table 2. Corrosion rate and effectiveness of the green inhibitor Salsola oppositifolia in 0.5 M H$_2$SO$_4$ at various concentrations and temperatures.

Inhibitor concentration mg/l.	Temperature, K	Corrosion rate g/m^2, days.	Inhibitor efficiency,%
200	298 K	0,003175	71,56
	313K	0,002895	69,36
400	298 K	0,004125	75,46
	313K	0,003765	72,58
600	298 K	0,003117	88,53
	313K	0,002171	83,76
1000	298 K	0,001125	92,38
	313K	0,001156	91,86

As can be seen from Table 2, at a concentration of 200 mg / l and a temperature of 31.3 K, the efficiency of the inhibitor is 69.36%, and at a concentration of 1000 mg / l, 313 K - 91.86%.

The effect of temperature. Studying the effect of temperature on the corrosion rate and the inhibitor efficiency facilitates the calculation of kinetic and thermodynamic parameters for inhibition and adsorption processes. These parameters are useful for interpreting the type of adsorption by the inhibitor. In general, the effectiveness of the inhibitor decreases with increasing temperature. The activation energy

(Ea) of this process is found using the Arrhenius equation 3 [20,21].

$$ln_{(\vartheta_{korr})} = B - \frac{E_a}{RT} \quad (3)$$

Here B is a constant depending on the type of metal, R is the universal gas constant, and T is the absolute temperature. The plot of the absolute temperature (1/T) ln$_{(vcorr)}$ gave a straight line slope = E$_a$/R, from which the activation energies for the corrosion and inhibition process were calculated.
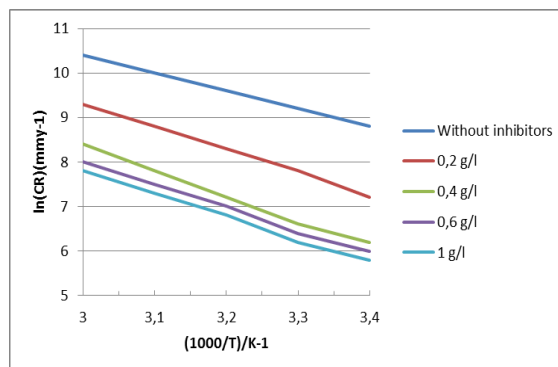
Figure 1. Arrhenius equation for inhibitors of various concentrations for steel in an acidic environment of 0.5 M H₂SO₄.

Using the Arrhenius equation, corrosion at various concentrations was calculated for 0.5 M H_2SO_4 acid with and without inhibitors. Calculated using the transition state equation for the corrosion process using thermodynamic parameters such as enthalpy (ΔH) and entropy (ΔS).

$$\vartheta_{(korr)} = \frac{RT}{Nh} \exp\left(\frac{\Delta S}{R}\right) exp\left(\frac{\Delta H}{RT}\right) \qquad (4)$$

Where h is Planck's constant, N - Avogadro's number. have a straight line with an inclination = $\Delta H/T$ and intersection 1/T relatively ln (forT) = ln (R / Nh) + ΔS / R.

Dependency plots 1/T от ln(v_{corr}/T) for corrosion of metals show the presence of the inhibitor at various concentrations in Figure 2. The calculated activation parameters are shown in Table 3. If we compare the activation energy (Ea) of the solution used with the inhibitor with the solution used without the inhibitor, we can see that the addition of the inhibitor (Ea) to the solution increases, and the activation energy increases with increasing inhibitor concentration in the solution. High activation energy is physical adsorption, if it does not change or less, then it is chemical adsorption.
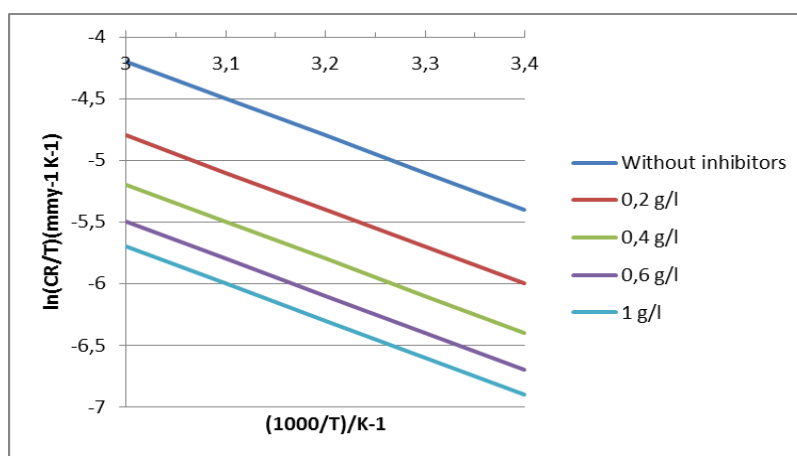
Figure 2. Diagrams 1/T for ln (vcorr/T) corrosion of steel in 0.5 M H₂SO₄ acid containing various inhibitor concentrations.

Table 3. Parameters of activation of 0.5 M acid H₂SO₄ at various inhibitor concentrations.

Inhibitor concentration	E_a (кДжмоль⁻¹)	ΔH_a (кДжмоль⁻¹)	ΔS_a (кДжмоль⁻¹К⁻¹)
0.0	42.56	43.74	-101.25
200	58.24	57.86	-75.21
400	63.42	59.93	-52.36
600	75.21	64.14	-23.12
1	88.19	79.63	18.36

As shown in Table 3, the values of activation energy (Ea) increase sharply with increasing inhibitor concentration. Therefore, in preventing corrosion, the

main function of an inhibitor is physical desorption on the metal surface. From the large negative entropy values, it can be seen that the phase that determines

the corrosion rate. The binding to the formation of the active complex is higher than the dissociation, which leads to a decrease in disorder [22,23].

Adsorption isotherm. The adsorption process refers to the desorption of water molecules by inhibitor molecules adsorbed on the metal surface, as well as the exchange process [24, 25]. From this we can see that the inhibitor is adsorbed on the metal surface and covers the surface (θ). As the inhibitor concentration increases, the surface is also covered to a greater extent and the efficiency increases. (θ) is basically a value indicative of inhibitor efficiency, taken up to 100. The adsorption isotherm was calculated from the Langmuir and Temkin isotherms. The Langmuir adsorption isotherm is represented by the following mathematical equation 5 [26].

$$\frac{C}{\theta} = \frac{1}{k_{ads}} + C \tag{5}$$

where C is the inhibitor concentration, θ is the degree of surface coverage, and kads is the adsorption equilibrium constant. Mass loss and electrochemical results are measured by the adsorption characteristics of the process. The Temkin isotherm is represented by the equation below (6).

$$\theta = \frac{-ln k_{ads}}{2a} - \frac{ln C}{2a} \tag{6}$$

In the above equation, the adsorption equilibrium constant kads and the parameters acting on a.
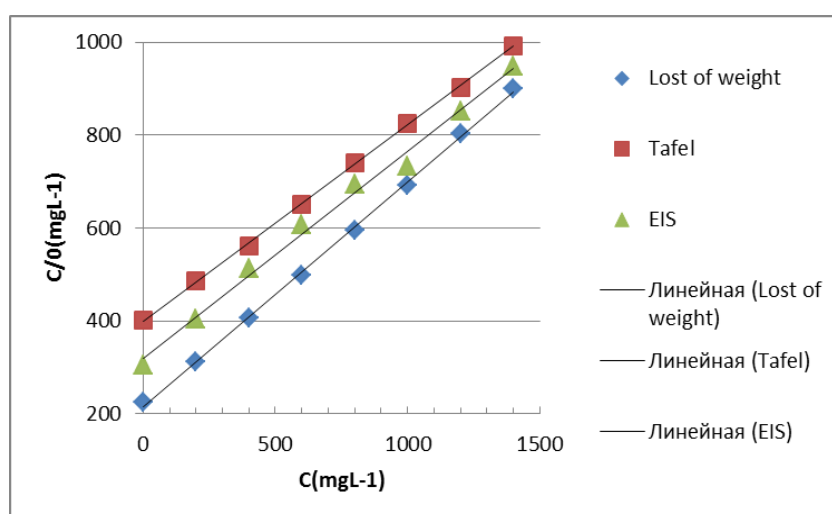
Figure 3. For carbon steel structures in 0.5 M H₂SO₄ acid 1 g/l with and without inhibitors.

Langmuir adsorption isotherm

Standard energy without adsorption ($\Delta G\,°_{ads}$) calculated using formula 7 below.

$$\Delta G^0_{ads} = -RT ln(k_{ads} x p_W) \tag{7}$$

Here R is the universal gas constant, T is the absolute temperature in Kelvin, ρW- density of water in g/l. The values of k_{ads} and $\Delta G°_{ads}$ for Langmuir and Temkin isotherms. The results calculated using Equations 3,4 and 5 above are shown in Table 4.

Table 4. Inhibitory and non-inhibitory parameters of the Langmuir adsorption isotherm for carbon steel in an acidic environment of 0.5 M H₂SO₄ at a concentration of 1 g/l.

Parameters	Mass loss	Tafel	EIS
Langmuir k_{ads}(L g⁻¹)	7.42	14.71	17.15
ΔG^0_{ads} (kJmol⁻¹)	-43	-40.5	-41.4
lnk_{ads} (L g⁻¹)	7	5	5
ΔG^0_{ads} (kJ mol⁻¹)	-38	-33	-32

A negative value of $\Delta G°_{ads}$ indicates that the adsorption peak has been reached. The $\Delta G°_{ads}$ value showed a range from -40.5 kJ mol-1 to -43 kJ mol-1 for the Langmuir adsorption isotherm. The DG °ads

value for the Temkin isotherm gives a range of $\Delta G°_{ads}$ values from -32 kJ mol-1 to -40 kJ mol-1. The value of $\Delta G°_{ads}$ - 40 kJ / mol is the equilibrium state of chemical and physical adsorption. It is assumed that

$\Delta G°ads$ represents the physical absorption if the value is less than -20 kJ/mol, and the chemical value if the $\Delta G°ads$ value is more negative than 40 kJ/mol.
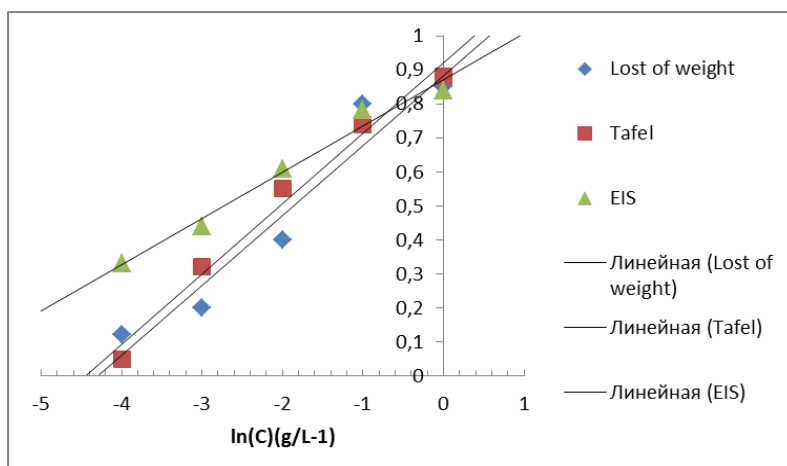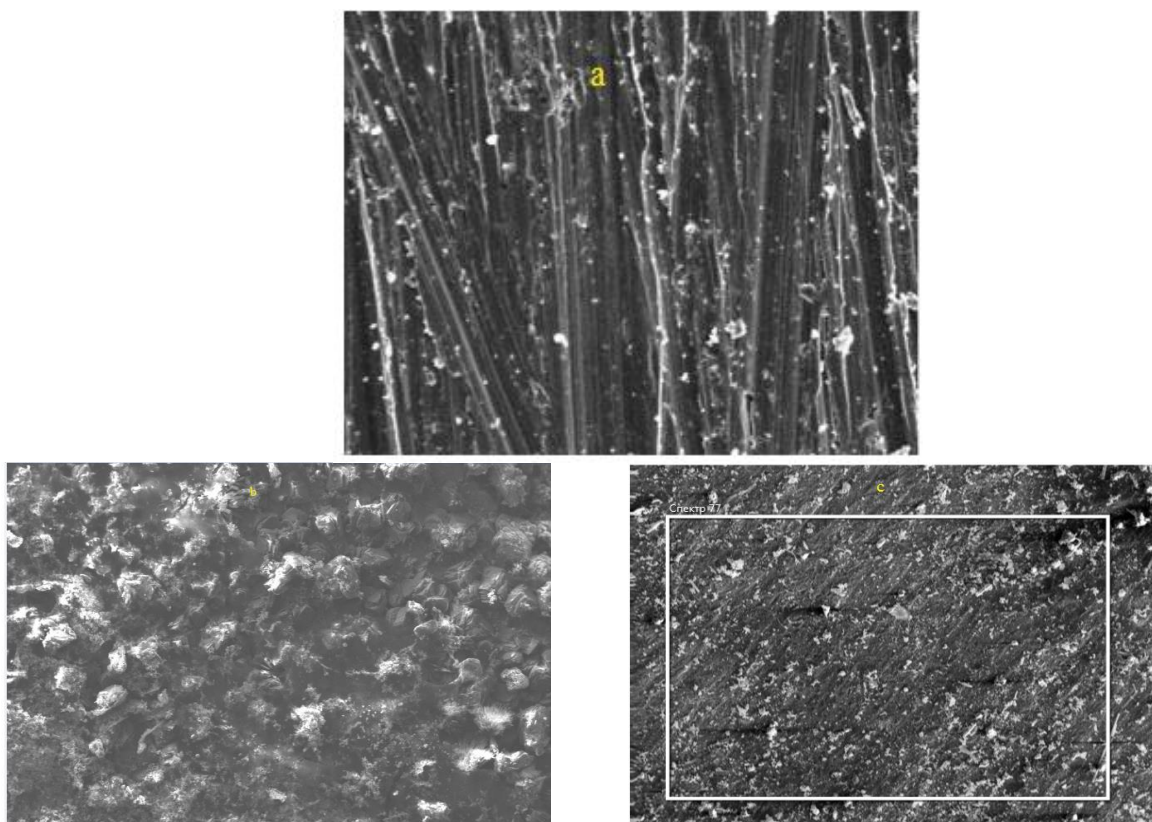

Figure 4. Inhibitor and non-inhibitor parameters of 1 g/L concentration for 0.5 M sulfuric acid medium for carbon steel.

Pic1: SEM images of treated steel [a], steel sample immersed in 0.5 M H_2SO_4 without inhibitors [b], and [c] steel immersed in 0,5 M H_2SO_4 in the presence of Salsola oppositifolia extract.

Scanning electron microscope (SEM). The purpose of this method is to generate various signals on the surface of solid samples using directed beams of high-energy electrons. SEM makes it possible to obtain information from the signals obtained from the electronic interaction of the sample, such as the surface structure (external morphology), chemical composition, component organization, and the crystal structure of the sample. The purpose of SEM analysis is to determine the presence of an inhibitor on the steel

surface. In addition, SEM analysis does not lead to a change in the composition of the sample, i.e. does not lead to loss of sample volume during electronic interaction with the sample.

When determining the morphological structure of the metal surface, the samples were examined using a scanning electron microscope. On pic. 1a shows the SEM analysis of the surface of a metal sample before the experiment. Pic.1b shows an example of a steel sample in 0.5 M H_2SO_4 solution without inhibitors after 120 hours. Figure 1c shows a surface view of a 0.5 M H_2SO_4 solution with an extract of Salsola oppositifolia. From the above SEM analysis, the following two mechanisms are known to play a key role in inhibitor adsorption on the steel surface:

a) interaction of the p-electrons of the aromatic rings of the inhibitor with the free d-orbitals of the iron atom on the surface of the steel according to the donor-acceptor mechanism.

b) interaction of undistributed paired electrons in the inhibitor and free d-orbitals of the iron atom on the steel surface according to the donor-acceptor mechanism.
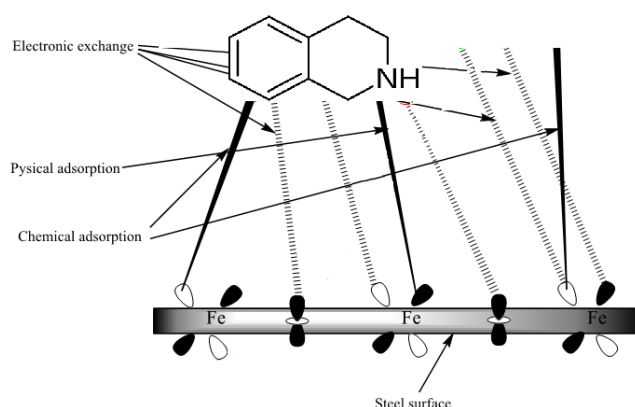
Pic 2: Corrosion protection mechanism

A model of the two mechanisms described above is shown in Pic 1. The figure shows that donor-acceptor interaction with empty d-orbitals on the iron atom of unshared electron pairs in functional groups in heteroatomic organic inhibitors and Vander-Physical and chemical adsorption based on Vander-Waltz forces, play an important role.

CONCLUSION

Based on practical results, it was shown that the extract of the plant Salsola oppositifolia is effective when used as a green inhibitor by 90,86% at a temperature of 313K. The effect of temperature on the process and the results of absorption and isotherm analysis proved that the obtained green inhibitor is not far behind chemically synthesized inhibitors.

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CULTURAL AND EDUCATIONAL INSTITUTIONS OF KARAKALPAKSTAN IN 1985-1991

Abstract: *The article examines cultural and educational institutions of Karakalpakstan in 1985-1991. The period under consideration, as a period of awakening and growth of national identity and revival of national culture, although it proceeded in the conditions of the socialist formation with all its contradictions and did not have a tangible clear orientation, adopted qualitative trends in the awakening of national identity. But, like every historical process, he did not escape costs, mistakes and contradictions due to various circumstances. A serious problem was not only the training of personnel for the field of culture and art, but also the arrangement of already trained specialists, and the material and technical support of cultural institutions remained low.*

Key words: *Karakalpakstan, culture, art, cultural and educational institutions, libraries, recreation parks, amateur art.*

Language: *Russian*

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КУЛЬТУРНО-ПРОСВЕТИТЕЛЬСКИЕ УЧРЕЖДЕНИЯ КАРАКАЛПАКСТАНА В 1985-1991 ГГ.

Аннотация: *В статье рассматривается культурно-просветительские учреждения Каракалпакстана в 1985-1991 годы. Рассматриваемый период, как период пробуждения и роста национального самосознания и возрождения национальной культуры, хотя и протекал в условиях социалистической формации со всеми её противоречиями и не имел осязаемую четкую направленность, вбирал качественные тенденции пробуждения национального самосознания. Но, как и всякий исторический процесс, он не избежал издержек, ошибок и противоречий в силу различных обстоятельств. Серьезной проблемой стала не только подготовка кадров для сферы культуры и искусства, но и обустройство уже подготовленных специалистов, низкой оставалась и материально-техническая обеспеченность учреждений культуры.*

Ключевые слова: *Каракалпакстан, культура, искусство, культурно-просветительские учреждения, библиотеки, парки отдыха, художественная самодеятельность.*

Введение

Культурная жизнь общества является наиболее важной структурной частью развития человеческой цивилизации. Она стала определяющим фактором в возрождении культурного, духовного наследия народов, восстановивших свою национальную независимость на рубеже 1990-х годов.

Кардинальные изменения в развитие общества принес эпоха «перестройки», которая благодаря гласности, создала предпосылки к постепенному росту интереса в Узбекистане к

изучению национальных традиций и духовных ценностей [1]. Однако в начале и в середине 1980-х годов эти попытки не были лишены идеологического основания, как и во всех действиях советского государства внутри страны. В рассматриваемый период снижается уровень работ, направленных на привлечение населения к очагам культуры и создание необходимых условий для них. К 1988 году в Узбекистане не было домов культуры в 500 крупных сёлах, а в пунктах проживания с населением более 1 тыс. человек не было элементарных очагов культуры. По изданию книг на родном языке Узбекистан занимал последнее место в СССР [2].

На июньском Пленуме ЦК КПСС (1983 г.) впервые была озвучена концептуальная основа новых тенденций в социально-культурной сфере общества. В частности, указывалась необходимость в комплексе сформировать характер нового человека эпохи «развитого социализма», использовать все возможности в интенсивном развитии социально-экономической сферы общества [3]. В дальнейшем на последующих пленумах партии данное положение дополнилось решениями о важности отношения каждого советского человека с совестью, инициативно, с творческим вдохновением, профессионально, решительно бороться с аморальными явлениями в быту и на производстве. Обращалось внимание на усиление государственного контроля, тесной связи вопросов резкого подъема уровня социально-экономической жизни с политико-идеологическим воспитанием каждой советской личности.

Формированию основ национально-культурного возрождения не способствовала и широкая сеть клубных учреждений, причиной чего была идеологическая классовая направленность их деятельности, спускаемая сверху и контролируемая партийными органами. Серьезная ситуация в культурно-просветительской сфере побудило руководство принять ряд решений. Лишь в начале 1980-х годов было принято «Положение о библиотечном деле в СССР», также связанное с попыткой реформирования в области образования. Коллегия Министерства культуры республики Каракалпакстан отмечала, что актуальной на сегодняшний день остается проблема воспитания и переквалификации кадров, повышения его идейно-теоретического уровня. К 1985 году в республике Каракалпакстан насчитывалось 190 клубных учреждений, в основном под ними понимались городские, районные, сельские клубы и дома культуры, автоклубы в системе Министерства культуры. Согласно документальным материалам, в Каракалпакстане существовало 22 городских, 20 районных и 46

сельских домов культуры, 65 сельских клубов, 37 автоклубов [4], 8 народных коллективов, из них 5 - народные театры, 3 - народные ансамбли и всего 3 парка культуры и отдыха (в Нукусе, Беруни и Турткуле).

Формой охвата населения и внедрения «социалистического» самосознания были централизованные клубные системы, под которыми подразумевались смешанные секции спорта и физической культуры, творческие кружки. Еще тогда в системе народного творчества намечаются проблески интереса к «национальному». Так, директор Республиканского научно-исследовательского центра народного творчества Каракалпакстана Т.Калиев утверждал, что «за последнее время получают широкое развитие ансамбли песни и танца, оркестры народных инструментов и хоровые коллективы, изобразительное и прикладное искусство» [5].

Однако количественные составляющие данной ситуации не соответствовали качественным характеристикам. Например, в 1985 году по республике Каракалпакстан действовали 17 централизованных библиотечных систем, включающих 499 библиотек (из них республиканских – 3, районных и городских 17, их филиалы – 357, детские филиалы – 42) [6]. Серьезной оставалась ситуация по обеспечению их материально-технической базы. Так, сельские учреждения культуры годами не ремонтируются, не отапливаются, 14 библиотек не имеют помещений, 9 сельских филиалов расположены в аварийных помещениях, многие библиотеки находились в неприспособленных помещениях, в одной комнате. На Коллегии Министерства культуры ККАССР также были отмечены серьезные недостатки в деятельности Республиканской библиотеки, в том числе и идеологическая направленность, однако все это объяснялось большой текучестью кадров [7].

Согласно официальным данным, по республике Каракалпакстан в 1984 году 455 массовых библиотек системы Министерства культуры с книжным фондом 4288,3 тысячи экземпляров охватывали 373,8 тысячи человек [8]. Только в Республиканской библиотеке насчитывалось 277434 экземпляров книг с охватом 7808 читателей, однако имелись большие сложности в её функционировании. В частности, фонды библиотеки находились в тесных сырых помещениях, не соблюдались элементарные санитарные нормы, режим хранения, также был выявлен ряд других недостатков [9]. При всех количественных показателях системы библиотечного дела в республике необходимо отметить сложную ситуацию в целом: почти все библиотеки находились в приспособленных помещениях, годами не ремонтировались,

финансировались по остаточному принципу, многие из них располагались в одной, в лучшем случае в двух комнатах, не говоря уже о современном оборудовании.

К началу 1987 года по республике Каракалпакстан было уже 486 библиотек (из них – 365 сельских, 24 районные, 48 городских, 45 детских и 3 республиканских) с охватом 376,9 тысячи человек. По республике в библиотеках работали 770 человек, т.е. в среднем 1-2 человека. В этот период приоритетным направлением библиотечного дела стало усиление агитационно-пропагандистской направленности их деятельности. Помимо этого, стало обращаться внимание и на вопросы национальной культуры и краеведения. Так, согласно уставу, библиотеки должны были подготовить рекомендательные списки, которые выполняли бы роль своего рода «гида» в библиотечных фондах. В 1987 году было подготовлено 10 таких списков, в том числе на тему «Культура и искусство нашего края», «Край, в котором мы живем» и т.п. [10].

В 1985 году было принято постановление партии «О мерах по усовершенствованию использования клубных учреждений и спортивных сооружений». Провозглашенная массовость физической культуры оказалась лишь на бумаге [11]. Ситуация после выхода постановления сложилась двояко: с одной стороны, развитие массовости физической культуры в республике обеспечивается Республиканским государственным комитетом по физической культуре и спорту, с другой - в сфере Министерства просвещения оказалось большинство спортивных сооружений. Например, в 1988 году в Кегейлийском районе открылась первая спортивная школа, однако в качестве ее использования, обеспечения материально-технической базой не было заинтересовано ни одно ведомство. Свои коррективы внесла и сложная экономическая ситуация. Так, в Муйнаке функционировала спортивная школа молодежи, которую не хотели брать на свой баланс ни районный отдел народного образования, ни местный спорткомитет в виду нехватки средств на содержание и эксплуатацию [12].

Также существовала форма общего идейно-теоретического образования как народные университеты культуры, которых по республике Каракалпакстан насчитывалось 62 [13]. В целом в клубных учреждениях республики, согласно официальным данным, действовало 911 кружков различного направления, широкое распространение получили ансамбли песни и танца, вокально-инструментальные ансамбли, оркестры народных инструментов. Именно в этот период начали свою творческую деятельность многие звезды каракалпакской эстрады, такие, как З.Ходжаназарова, Г.Мунтеева, пользовавшийся большой популярностью вокально-инструментальный ансамбль «Ойнасын».

К концу 1980-х годов в культурной жизни республики Каракалпакстана проявились новые тенденции: широко было отмечено 160-летие великого каракалпакского поэта и мыслителя Бердаха и, как утверждают источники, это стало важнейшим событием в духовной жизни республики [14]. Была организована выставка «Поэт Каракалпакии», состоялся большой концерт, научная часть мероприятий проходила с участием широкого круга интеллигенции Узбекистана и других братских республик.

Новые тенденции в национальной культуре Каракалпакстана стали проявляться к 1987 году. Например, в клубном учреждении были организованы конкурсы - солистов-вокалистов, духовых оркестров, семейных ансамблей, бахсы и жырау. Победители конкурсов достойно представляли национальное искусство Каракалпакстана на республиканском уровне: семейный ансамбль Аллашукуровых занял 1 место по Узбекистану, семья Уразбаевых – 3 место, бахсы Есболганов занял 1 место, Жумабай жырау Базаров – 2 место [15]. Важны не призовые места, а то, что национальное искусство, куда входит искусство бахсы и жырау, духовные ценности, такие, как семья, семейный очаг стали проявляться через искусство. Это были первые ростки пробуждающегося национального самосознания и чувства национального достоинства. Это было проявлено и в первом национальном фестивале «Нукусская весна», в котором приняли участие представители почти из всех районов, показывая свое искусство по 12 жанрам, в том числе искусство бахсы и жырау. В следующем году это мероприятие получило название молодежного фестиваля «Нукусская весна», проходившего с 14 по 18 мая 1988 года в г. Нукусе в рамках Всесоюзного фестиваля народного творчества. В фестивале участвовали 800 представителей из 13 районов Каракалпакстана [16].

Широко стала пропагандироваться деятельность самодеятельных национальных коллективов. Так, в 1987 году была организована выставка в Ургенче «Художники Каракалпакии», в республике Каракалпакстан – выставки «Творчество И.В.Савицкого», «Творчество К.Саипова», «Предметы археологии и народно-прикладного искусства», «Охрана природы Каракалпакии», прошли вечера, посвященный 160-летию Бердаха, встреча с народной артисткой А.Шамуратовой [17]. В г. Москве был проведен вечер, посвященный музею им. И.В.Савицкого «Музей со служебного входа», получивший теплые отзывы москвичей и гостей столицы бывшего СССР.

Таким образом, вторая половина 1980-х годов и начало 1990-х восприняты как период пробуждения и роста национального самосознания и возрождения национальной культуры. Этот процесс хотя и протекал в условиях социалистической формации со всеми её противоречиями и не имел осязаемую четкую направленность, вбирал качественные тенденции пробуждения национального самосознания и ясно определил и обусловил необходимость формирования совершенно новой концепции национально-культурного возрождения на основе полной национальной независимости и государственного суверенитета, создания идеологического, методологического фундамента на основе глубокого изучения и использования позитивного национально-культурного

своеобразия и духовного наследия коренных народов республики. Естественно, как и всякий исторический процесс, он не избежал издержек, ошибок и противоречий в силу различных обстоятельств. Наличие определенного количества общеобразовательных и музыкальных школ, специализированных школ искусства, дворцов и домов культуры, библиотек и других объектов культурно-просветительских учреждений - еще не показатель действительного уровня культурного процесса. Серьезной проблемой стала не только подготовка кадров для сферы культуры и искусства, но и обустройство уже подготовленных специалистов, низкой оставалась и материально-техническая обеспеченность учреждений культуры.

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Issue   **Article**

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LEGAL BASIS AND FOREIGN EXPERIENCE IN ASSESSING THE CAPITAL OF COMMERCIAL BANKS

Abstract: *The paper studies the legal framework for assessing the capital of commercial banks and foreign experience, as well as the analysis of the current legislation of the country where the bank operates and how each country should conduct monetary policy based on its political and economic goals comments given.*
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Introduction

When analyzing bank activities, it is critical to consider the current state of the country in which the bank operates. Each state formulates its monetary policy in accordance with its political and economic objectives. Additionally, the necessary knowledge and experience must be acquired through study of foreign experience in this field. Due to the topic's importance, this section analyzes the legal framework and international experience with commercial bank capital valuation. Today, the Republic of Uzbekistan's banking system and banking activities are regulated by a new edition of the Law "On Banks and Banking," which was adopted on November 5, 2019 by the Law of the Republic of Uzbekistan. The Republic of Uzbekistan's banking system is two-tiered, consisting of the Central Bank and commercial banks. The Central Bank of the Republic of Uzbekistan is a state-owned institution that regulates the banking sector and has licensing, regulatory, and prudential supervisory powers. The requirements for the bank's authorized capital are set out in the preceding law, which stipulates that the bank's authorized capital must be at least one hundred billion soums.

The bank's authorized capital is denominated in the Republic of Uzbekistan's national currency and is comprised of funds contributed by the bank's founders and shareholders or government securities, except in

the following circumstances: - payment of the bank's shares by allocating them among the bank's creditors, taking into account any rights (claims) of the bank on monetary obligations to creditors;

- the exchange of securities for bank shares;

- the exchange of one type of bank's placed shares for another type of bank's placed shares.

Credit, collateral, and other mandatory funds cannot be used to establish the bank's authorized capital.

The bank's founders must enter the minimum amount of authorized capital prior to submitting the bank's application for state registration and licensing. Contributions to the authorized capital are deposited in a bank savings account.

In the event of a systemic financial crisis, the Ministry of Finance of the Republic of Uzbekistan may purchase bank shares in lieu of government securities.

The Central Bank is the state-level banking supervisor, establishing mandatory regulations that commercial banks must follow in the course of their operations in the interests of bank customers and the economy.

The main part

In order to ensure the financial stability of banks and protect the interests of depositors and creditors,

banks and banking groups must comply with prudential standards set by the Central Bank.

Prudential standards include:

capital adequacy ratios;

the maximum amount of risk per borrower or group of related borrowers;

maximum amount of major credit risks and investments;

coefficients of concentration by sectors;

liquidity ratios;

the maximum amount of risk for the bank's related parties;

maximum amount of unsecured loans (trust-based loans);

requirements for the classification of the bank's assets and assessment of their quality, the formation of reserves against possible losses on bank assets on the basis of asset classification;

requirements for accrual of interest on bank assets and their inclusion in the bank's income account;

the maximum amount of shares and shares to be purchased in the charter funds (authorized capital) of legal entities;

requirements for the acquisition and possession of real estate and other property;

open currency position limits;

other prudential standards set by the Central Bank in accordance with generally accepted international practice.

Banks need to adequately maintain their capital and liquid resources in order to reduce the risk of asset losses, build up reserves against potential asset losses based on asset classification, and ensure the diversification of their assets.

The central bank has the right to set additional premiums for banks, groups of banks and banks of sufficient liquidity and capital adequacy ratios to compensate for possible losses in the event of the greatest changes in risk factors specific to the bank, system of banks and groups of banks.Future changes to prudential regulations will be officially announced by the Central Bank at least one month before these changes are made.One of these prudential standards is the capital requirements of these commercial banks. This normative document is the Regulation "On requirements to the capital adequacy of commercial banks", registered by the Ministry of Justice of the Republic of Uzbekistan on July 6, 2015 No 2693. The requirements of the Regulation "On the requirements for the capital adequacy of commercial banks" determine the minimum level of capital of commercial banks, based on international experience.

This normative document defines the following components and requirements related to capital adequacy:

minimum capital requirements;

capital structure;

risk-taking assets;

off-balance sheet funds;

derivative means;

calculation of capital similarity;

final rules and applications.

Analysis and results

The capital adequacy requirements of commercial banks are based on the requirements of the International Basel Committee on Banking Supervision.

Table 1. Basic requirements of Basel III normative standards and differences   from Basel I and II.

Elements	Basel I / II Requirements	New requirements (Basel III)
Minimum capital requirements	Tier 1 fixed capital / risk amount (RM) $\geq$ 2%; Tier 1 capital / RM $\geq$ 4% Total capital / RM $\geq$ 8%	Tier 1 fixed capital / risk amount (RM) $\geq$ 4.5%; Tier 1 capital / RM $\geq$ 6% Total capital / RM $\geq$ 8%
Innovative instruments	tier 1 capital (but not more than 15% of tier 1 capital)	Gradual deduction
Tier 3 capital	should not exceed 250% of Tier 1 capital intended to cover market risks	Canceled
Restrictions	Tier 2 capital $\leq$ Tier 1 capital; Subordinate debt obligations $\leq$ 50% of tier 1 capital Canceled	Canceled
Adjustments / discounts (excluding goodwill,	50% of Tier 1 capital and 50% of Tier 2 capital,	100% of Tier 1 fixed capital
Conservation buffer	Not available	4.5% in addition to Tier 1 fixed capital / RM in the amount of 2.5%
Contrast-enhancing buffer	Not available	In the amount of 0-2.5% of RM

The normative norms of the International Basel Committee on Banking Supervision are determined by the trend of economic changes around the world. As a major change from Basel III to Basel II, prudential requirements for capital and prudential requirements for liquidity were included in the capital account of banks.

The main directions offered by Basel III are:

the introduction of new requirements for the minimum level of fixed capital and its components, fixed capital, the gradual reduction of the recognition of hybrid instruments in capital, the list of regulatory deductions from capital;

tightening of capital requirements for banks and introduction of new liquidity standards - short-term (Liquidity Coverage Ratio - LCR) and long-term (Net Stable Funding Ratio - NSFR), application of the Leverage indicator.

As well as the introduction of additional capital buffers: the Capital Conservation Buffer and the Countercyclical Buffer.

Hence, Basel III envisaged the formation of two buffer capitals: a conservation buffer and a contra cyclic buffer. The main purpose of the formation of the conservation buffer is a "simple" addition to the minimum requirements to maintain the level of capital adequacy to cover the losses of the bank in times of systemic recession. In order to provide a conservation buffer, banks will have to limit the distribution of profits. Commercial banks of the Republic of Uzbekistan comply with the regulatory requirements of both the International Basel Committee and the Central Bank of the Republic of Uzbekistan. The capital adequacy, liquidity ratios and many other ratios of commercial banks are calculated and reported to the Central Bank.

The following table shows the dynamics over the years of the minimum amount of capital of commercial banks and the corresponding coefficients in accordance with the rules and requirements of Basel III.

Table 2. Requirements to the capital of commercial banks of the Republic of Uzbekistan based on the basic requirements of the Basel III normative standards

Indicators	Effective date				
	01.09.2015	2016	2017	2018	2019
Regulatory capital, (K1)	10%	11,5%	12,5%	13,5%	14,5%
1 level capital, (K2)	7,5%	8,5%	9,5%	10,5%	11%
1 level basic capital	6%	7%	7,5%	8,5%	9,5%
Leverage coefficient, (K3)	6%	6%	6%	6%	6%
Current liquidity ratio, (JLK)	30%	30%	30%	30%	30%
Liquidity Coverage Ratio, (LQMC))	-	80%	90%	100%	100%
Net Sustainable Financing Ratio, (SBMMK)	-	-	-	100%	100%

The normative requirements and minimum standards given in the table above are mandatory for all commercial banks in the country. It should be noted that the state has a share in the shares of a number of commercial banks in the Republic of Uzbekistan. This increases their financial capacity compared to private commercial banks and may lead to a violation of the principle of fair competition. The analysis of this situation in the following sections of the scientific work confirms how true or false this theoretical view is.

According to the norms of the International Basel Committee, the adequacy of bank capital is determined by the ratio of bank capital to rickshaws in total active operations.

Another system for assessing the adequacy of bank capital and the requirements for it is the CAMELS system for assessing the adequacy of banking capital used in the United States.

CAMELS is a methodology for analyzing the activities of banks, introduced in 1978 by the US regulators after the decision to standardize the systems

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of analysis of the financial condition of commercial banks and other credit institutions.

CAMELS is an abbreviation of the initial letters of the components being analyzed.

C – capital adequacy, It is a set of standardized requirements that define the minimum capital values of banks and other credit institutions and how much they should be. These requirements are designed to protect banks themselves, their customers and the country's economy by setting rules and principles that must ensure the safety and efficiency of banking activities that can withstand any potential challenges.

The following two important coefficients should be calculated:

1) the ratio of total capital to the sum of assets and off-balance sheet items involved in the degree of risk;

2) the ratio of fixed capital to the amount of involved assets and off-balance sheet items on the level of risk.

A – asset quality, . Asset quality is linked to the left side of the bank balance sheet. The bank's management should monitor the quality of bank loans, as the income of commercial banks depends on the loans disbursed. The quality of loans and assets are basically two conditions that have the same meaning. The analysis of asset quality analyzes the increase in credit risk, the impact of problem loans on banking activities.

At this stage of the analysis, assets are divided into the following three groups: non-standard assets, doubtful assets and losses. In addition, a total weighted classification is performed that includes assets classified as 20% non-standard, 50% doubtful and 100% loss.

The ratio of the total weighted classification to total capital is a key indicator of asset quality.

M – management, . The quality of bank management is determined on the basis of the assessment of compliance with the laws and regulations adopted by the control system.

In assessing the quality of management, the following is analyzed:

efficiency of bank management;

the impact of objective and subjective factors, such as capital adequacy, asset quality and profitability;

professionalism of management staff;

the existence of internal procedures of the bank and the level of compliance with it;

the degree of preparation for future changes in banking activities, their planning and mitigation of existing risks.

E – earnings, In assessing the efficiency of the bank's activities, the bank's future development is forecasted by analyzing the sources of the bank's profits and increasing profits. In assessing the bank's income, the structure and composition of income is analyzed based on the return on bank assets for the last three years.

Return on bank assets = Net income / Average total assets

L - liquidity, In the CAMELS system, the liquidity of banks is analyzed in terms of timely fulfillment of bank obligations. Bank liquidity is the ability to meet obligations without incurring excessive losses. Liquidity management is a day-to-day process that requires bankers to control cash flows. At the same time, it is very important to maintain a balance between short-term assets and short-term liabilities.

Banks' liquidity is assessed on a scale of 1 to 5, and at this stage the following is analyzed: deposit volatility, level of dependence on credit resources, sensitivity to changes in interest rates, availability of liquid assets, access to money markets, efficiency of asset and liability management, etc.

S - sensitivity to risk. At this stage, the dependence of the bank's financial condition on changes in interest rates is analyzed. As a result of these analyzes, the effectiveness and flexibility of the CAMELS system of banking system evaluation has been proven.

FIMS system of analysis of banking activities. As the CAMELS system justified itself, the mechanisms for analyzing the performance of banks became increasingly sophisticated. The FIMS method of monitoring the financial stability of banks has been developed and put into practice. The purpose of this system is to constantly monitor the activities of the bank on the basis of its reports. As a result, deficiencies identified as a result of various inspections are eliminated in advance.

This system involves the calculation of two complementary ratings: the FIMS rating and the FIMS risk category.

The FIMS rating is an assessment of the bank's current condition based on changes in a number of financial indicators over the past quarter and an analysis of the results of field inspections. The CAMELS methodology is used in this rating and the bank's position is assessed by a rating score of 1 to 5.

The FIMS rating includes the following ratios relative to the bank's assets: capital adequacy, net income, reserves, liquid assets, fixed deposits, loans, etc.

FIMS risk analysis analyzes the possibility of realization of forecasts for the next period of banking activities, the impact of risks affecting banking activities.

RATE system of analysis of banking activities. The RATE system has been used by the Bank of England since 1997 to assess the financial stability of banks. This system consists of three interrelated blocks: Risk Assessment - risk assessment (risk assessment), Tools - control tools, Evaluation - evaluation of the effectiveness of the use of control tools.

The RATE analysis system used in the banking business conducts analysis in 9 areas. During the analysis, it is important to study the importance of the following factors: capital, assets, market risk, profitability, liabilities, and business.

The analysis of these factors is based on the financial statements of banks.

Conclusions and suggestions

There are many other ways to effectively analyze the activities of banks, which are determined by the requirements of the banking system of the country. It can be said that in today's era of developed international economic relations, the economic situation and assets of banks will be the main focus not only of domestic market participants, but also of foreign economic entities. This, in turn, requires the effective organization of banking activities, reducing the risks affecting its activities, increasing the bank's capital and profits, developing and implementing a reliable and effective system of supervision of banking activities.

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RESEARCH OF SYNTHESIS OF SUPERPLASTICIZER ON A BASIS NAPHTHA AND ITS INFLUENCE ON PHYSICOMECHANICAL PROPERTIES CEMENT COMPOSITIONS

Abstract: This article presents the results of a study of a synthesized superplasticizer based on naphthalenesulfonic acid formaldehyde. The IR spectroscopy of the synthesized superplasticizer and the effect of the superplasticizer on the properties of Portland cement and gypsum have been studied. It has been established that the superplasticizer activates pozzolanic and hydraulic properties, increases strength, and activates hydration processes.
Key words: polyacrylonitrile, superplasticizer, naphtha, density, spreadability, plasticizing effect.
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ИССЛЕДОВАНИЕ СИНТЕЗА СУПЕРПЛАСТИФИКАТОРА И ВЛИЯНИЕ ЕГО НА ФИЗИКО-МЕХАНИЧЕСКИЕ СВОЙСТВА ЦЕМЕНТНЫХ КОМПОЗИЦИЙ

Аннотация: В данной статье приведены результаты исследования синтезированного суперпластификатора на основе нафталинсульфокислотного формальдегида. Изучена ИК-спектроскопия синтезированного суперпластификатора и влияние суперпластификатора на свойства портландцемента и гипса. Установлено, что суперпластификатор активизирует пуццолановые и гидравлические свойства, повышает прочность, активизирует гидрационные процессы.
Ключевые слова: суперпластификатор, пиролизное масло, плотность, растекаемость, пластифицирующий эффект.

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Введение

На сегодняшний день в строительной отрасли актуальным является применение модификаторов на основе синтетических олигомеров для улучшения реологических, физико- механических свойств и регулирования структурообразования композиционных материалов.

В последние годы одной из важнейших проблем в области химических добавок, для строительных материалов, является поиск новых органических добавок, повышающих стойкость и долговечность конструкций и сооружений, воздействию климатических условий и агрессивных сред.

Для улучшения качества цементных композиций является важным применение высокоэффективных пластифицирующих добавок. В строительной индустрии для регулирования процессов структурообразования и реологических свойств концентрированных суспензий применяют суперпластификаторы - органические химические добавки, позволяющие це- ленаправленно изменять подвижность сырьевых смесей и свойства готовых изделий. Поиск новых эффективных добавок, позволяющих модифицировать поверхность раздела фаз и изменять реологические свойства дисперсий, является актуальной задачей [1].

По сравнению с наиболее распространенными строительными материалами хорошо известно, что армированные волокном цементные материалы обладают лучшими физическими, рабочими и механическими свойствами. В этом исследовании были выбраны три волокна: полипропиленовое волокно (ППВ) и волокно из поливинилового спирта (ПВС), которые представляли синтетические волокна, и волокно из сизаля (ВС), которое представляло натуральные волокна. Было исследовано влияние этих волокон на текучесть, реологические свойства и адсорбционные свойства цементной пасты с поликарбоксилатным суперпластификатором (ПКС). Кроме того, вышеуказанные экспериментальные результаты были проверены путем измерения угла контакта волокна с водой и раствором ПКС в видимой морфологии волокна. Результаты показали, что добавление волокон значительно снижает текучесть цементного теста, в то время как предел текучести и пластическая вязкость цементного теста увеличиваются с добавлением волокон. Судя по углу контакта и сканирующему электронному микроскопу, поверхность ВС была относительно шероховатой, а угол контакта ВС с водой или раствором был наименьшим. Можно сделать вывод, что растительное волокно оказывает значительное влияние на текучесть и реологию цементной пасты[2]. Значение суперпластификаторов (СПС) в устойчивом развитии бетонной промышленности хорошо известно в отношении снижения содержания воды и портландцемента в смесях. Необходима разработка экологически эффективных альтернативных типов СПС. Суперпластификатор, на основе гуминовой кислоты, полученный из леонардита, в качестве природного органического вещества, был исследован с точки зрения его пластифицирующих свойств и влияния на гидратацию, а также свойств портландцемента (ПЦ) по сравнению с лигносульфонатом (ЛС) и примесью на основе нафталина (НА). Влияние леонардита на гидратацию портландцемента было исследовано при различных дозировках добавки с помощью изотермической калориметрии и термогравиметрического анализа затвердевших паст. Кроме того, также было изучено влияние добавок на время схватывания паст для ПЦ, а также на текучесть и прочность строительных растворов на сжатие. Экспериментальные результаты показали, что леонардит оказывает аналогичное влияние на кинетику ранней гидратации и время схватывания ПЦ по сравнению с НА. Однако ЛС вызвал резкое замедление гидратации ПЦ. Добавление леонардита также увеличивало степень гидратации ПЦ как через 7, так и через 28 дней, и это увеличение было более выраженным через 7 дней. Леонардит показал сопоставимые пластифицирующие свойства с другими добавками, измеренные по расходу строительных растворов для 0,3% эквивалентной дозы твердого вещества. Прочность на сжатие строительных растворов с добавлением леонардита была выше, чем у контрольного раствора ПЦ в возрасте 3, 7 и 28 дней для всех испытанных доз. Было обнаружено, что леонардит обладает значительным потенциалом для использования в качестве суперпластификатора в цементирующих системах с его разумным влиянием на гидратацию и свойства ПЦ[3].

В этой работе оценивалось влияние частичной замены суперпластификатора на силаны, на свежие и затвердевшие свойства портландцементных паст. Для этого были получены пасты с соотношением вода/цемент 0,20 и 25 и 50% заменой суперпластификатора на основе поликарбоксилатного эфира на тетраэтоксисилан (ТЕОС), 3-глицидоксипропилтриметоксисилан (ГПТМС) и аминоэтиламинопропилтриметоксисилан (АЕАП ТМС). Удельный вес, содержание захваченного воздуха и мини-осадок паст определяли в свежем состоянии. Кинетику гидратации оценивали методом изотермической калориметрии до 120 ч. Наконец, прочность паст на сжатие и изгиб, а также соотношение между ними (называемое ударной вязкостью) были определены через 7 и 28

дней. Результаты показали, что замена 25% на силаны увеличила мини-спад, либо снизила содержание воздуха в пастах по сравнению с эталоном. Напротив, 50%-ное включение ГПТМ и АЕАП увеличивало содержание воздуха и уменьшало мини-оседание паст, в то время как 50% ТЕОС существенно не влияло на эти свойства. Изотермическая калориметрия показала, что ТЕОС сократил период индукции паст, в то время как другие силаны увеличили его, задержав начало периода ускорения до 53 ч по сравнению с эталоном. Кроме того, увеличение содержания обоих силанов постепенно увеличивало накопленную теплоту до 120 ч, достигая значений, на 11% превышающих контрольные. Включение ТЕОС постепенно увеличивало прочность на изгиб, в то время как прочность на сжатие существенно не изменялась как на 7, так и на 28-й день. Та же тенденция была обнаружена для прочности на сжатие паст, содержащих ГПТМС и АЕАП ТМС, в то время как прочность на изгиб этих паст снижалась по мере увеличения уровня замены. Наконец, прочность паст в течение 7 и 28 дней увеличивалась по мере увеличения содержания ТЕОС, в то время как для ГПТМ и АЕАП не было обнаружено четкой тенденции[4]. Были синтезированы, охарактеризованы и изучены поликарбоксилатные суперпластификаторы на основе метоксиполиэтиленгликоля метакрилат-со-метакриловой кислоты на основе метакрилового эфира с различной плотностью боковой цепи и длиной боковой цепи, а также их влияние на обрабатываемость, реологию, время схватывания и механическую прочность цементных систем. Результаты показали, что синтезированные сополимеры изменяют реологические свойства цементных суспензий в сторону сгущения при сдвиге, а СПС с низкой плотностью боковой цепи повышают текучесть, удержание текучести и прочность образцов выше, чем у их аналогов. Кроме того, поликарбоксилаты замедляют гидратацию цемента, а низкие дозы

триэтаноламина могут быть предпочтительными в качестве ускорителя для применения в холодную погоду или для ранней механической прочности цементных систем[5]. Суперпластификаторы поликарбоксилата с замедленным высвобождением на основе сложных эфиров (ПСТ) обладают высокой текучестью и хорошим эффектом удержания осадка в бетонных растворах. Следовательно, в этом исследовании ранее подготовленный ненасыщенный триэтилцитрат (в качестве функционального мономера), акриловая кислота и изопренилокси полиэтиленгликоль (в качестве основного сырья) были использованы для синтеза серии ПСТ путем свободнорадикальной полимеризации. Для характеристики ПСТ использовались методы протонного ядерного магнитного резонанса и инфракрасной спектроскопии с преобразованием Фурье. Кроме того, испытания цементной пасты на текучесть, адсорбционные характеристики и дзета-потенциал (д-потенциал) показали, что полимеры демонстрируют хороший диспергирующий эффект и отличное удерживание жидкости, например, ПСТ-2 достиг 305 мм с 265 мм за 3 часа. Результаты термической гидратации и сканирующей электронной микроскопии показали, что ПСТ проявляет гораздо более сильное замедление гидратации цемента, чем традиционные поликарбоксилатные суперпластификаторы, вероятно, из-за его несравненной дисперсности и свойств замедленного высвобождения. После 1, 7 и 28 дней гидратации микроструктура цементной пасты стала более плотной, что способствовало укреплению цементного раствора[6-7].

Постановка исследований.

Был синтезирован суперпластификатор на основе пиролизного масла, производимого на ООО «UzKorGaz». На рис. 1. приведен ИК-спектр синтезированного суперпластификатора на основе нафталинсульфокислотного формальдегида.
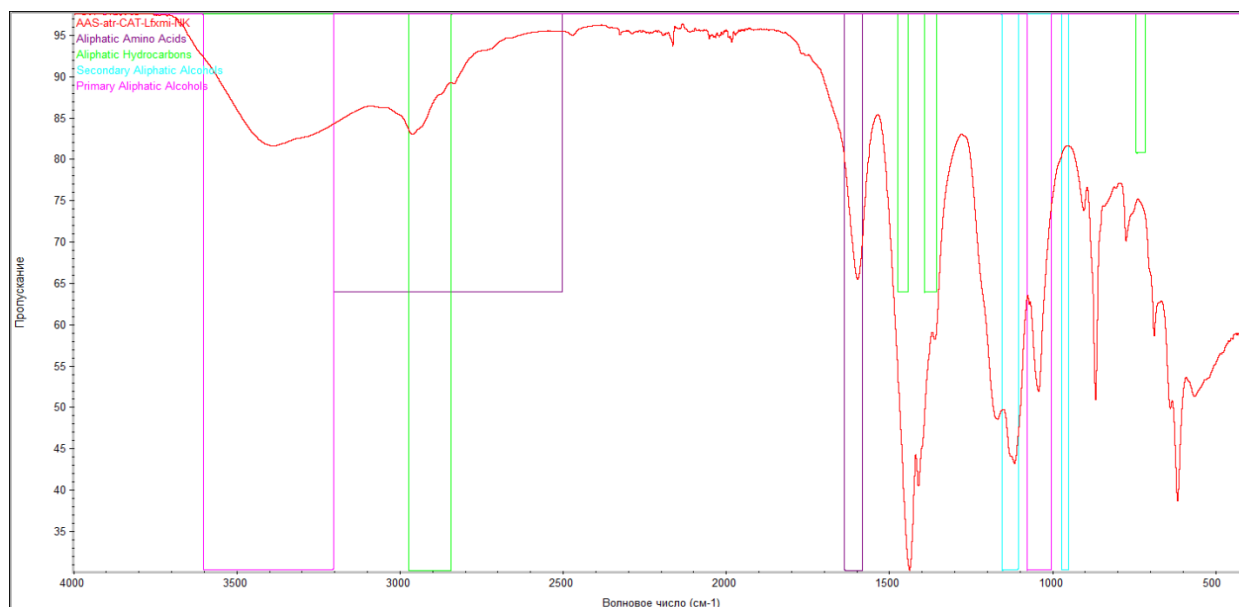
Рис.1. ИК-спектр синтезированного суперпластфикатора

Исходя из ИК-спектра, можно сказать, что полученный суперпластификатор имеет в основном следующие функциональные группы: Новые полосы поглощения в области 1166,14 см-1 показывают, что функциональная группа SO2-OH изменила свою структуру на химическую связь R-SO2-OH. ИК-спектр содержит линии поглощения для асимметричных валентных колебаний в области -1040,14 см-1 и характерные линии поглощения для симметричных валентных колебаний в области 772,10-614,31 см-1. Это говорит о том, что синтезированный суперпластификатор имеет функциональную группу - сульфокислоту. Вещество, используемое в качестве сырья для производства суперпластификатора, имеет в своем составе функциональные группы (C-S). Это означает, что используемое сырье тоже поверхностно-активное вещество, но проведенные эксперименты показывают, что использованное сырье не влияет на реологические свойства бетонной смеси.

Для испытания суперпластификатора были выбраны в качестве сухих строительных материалов портландцемент ПЦ 400 Д-20 и гипс. Портландцемент ПЦ 400 Д-20 используется в различных видах строительства в большом количестве. Строительный гипс в настоящее время играет важную роль в строительстве. Исходя из этого, изучение физико-механических свойств строительных композиций на основе портландцемента ПЦ 400 и строительного гипса с добавлением синтезированного суперпластификатора имеет важное значение.

Суперпластификатор был добавлен в количестведо 1% от массы вяжущего. Добавление суперпластификаторов больше 1% в большинстве случаев приводит к снижению прочности цементного камня и считается нерентабельным.

Средняя плотность цементного камня показывает удобоукладываемость цементных паст при низком В/Ц соотношении.

Таблица 1. Результаты испытаний цементных паст с синтезированным суперпластификатором

№	Количество цемента, г	Количество добавки от массы цемента, %	В/Ц соотно-шение	Средняя плотность, г/см³	Прочность через 14 сут, МПа
1	100	–	0,30	20,65	26
2	100	0,2	0,29	2,45	27
3	100	0,4	0,28	2,3	28
4	100	0,6	0,26	2,36	29
5	100	0,8	0,25	2,40	30
6	100	1	0,25	2,2	31

Как видно из таблицы1, при добавлении синтезированного суперпластификатора в постоянном водно-цементном соотношении прочность увеличивается, и средняя плотность цементного камня показывает улучшение удобоукладываемости цементных паст с увеличением количества суперпластификатора.

Таблица 2. Результаты испытаний гипсовых паст с синтезированным суперпластификатором

№	Количество гипса, г	Количество добавки от массы гипса, %	В/Г соотношение	Растекае-мость, см	Прочность через 14 сут, МПа
1	100	–	0,8	8	11,7
2	100	0,04	0,8	9	16,5
3	100	0,3	0,8	10	15
4	100	0,5	0,8	11	14,3
5	100	0,9	0,8	12	13
6	100	1	0,8	13	12

Как показано в таблице 2, суперпластификатор тоже имеет средний пластифицирующий эффект и, с увеличением количества суперпластификатора, прочность снижается, но при малых количествах прочность увеличилась с 11,7 МПа до 16,5 МПа.

Специфической особенностью суперпластификатора является тот факт, что в присутствии суперпластификатора происходит формирование более мелкой кристаллической структуры цементного камня нормального твердения.

Заключение

Таким образом, введение суперпластификатора в цементные композиты позволит активизировать пуццолановые и гидравлические свойства шлака, получить значительный прирост прочности при использовании добавок в оптимальных количествах, а также активизировать гидратационные процессы. На основе пиролизного масла, производимого на ООО «UzKorGaz», был синтезирован суперпластификатор и изучен ИК-спектр этого вещества. Проводили испытания на основе цемента марки 400 Д-20 и гипса.

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