

ISSN 2518-1483 (Online),  
ISSN 2224-5227 (Print)

2019 • 4

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ  
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫНЫҢ  
**БАЯНДАМАЛАРЫ**

---

**ДОКЛАДЫ**

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК  
РЕСПУБЛИКИ КАЗАХСТАН

**REPORTS**

OF THE NATIONAL ACADEMY OF SCIENCES  
OF THE REPUBLIC OF KAZAKHSTAN

PUBLISHED SINCE 1944



ALMATY, NAS RK

Б а с р е д а к т о р ы  
х.ғ.д., проф., ҚР ҰҒА академигі **М.Ж. Жұрынов**

Р е д а к ц и я л қ а с ы:

**Адекенов С.М.** проф., академик (Қазақстан) (бас ред. орынбасары)  
**Величкин В.И.** проф., корр.-мүшесі (Ресей)  
**Вольдемар Вуйцик** проф. (Польша)  
**Гончарук В.В.** проф., академик (Украина)  
**Гордиенко А.И.** проф., академик (Белорус)  
**Дука Г.** проф., академик (Молдова)  
**Илолов М.И.** проф., академик (Тәжікстан),  
**Леска Богуслава** проф. (Польша),  
**Локшин В.Н.** проф. чл.-корр. (Қазақстан)  
**Нараев В.Н.** проф. (Ресей)  
**Неклюдов И.М.** проф., академик (Украина)  
**Нур Изура Удзир** проф. (Малайзия)  
**Перни Стефано** проф. (Ұлыбритания)  
**Потапов В.А.** проф. (Украина)  
**Прокопович Полина** проф. (Ұлыбритания)  
**Омбаев А.М.** проф., корр.-мүшесі (Қазақстан)  
**Өтелбаев М.О.** проф., академик (Қазақстан)  
**Садыбеков М.А.** проф., корр.-мүшесі (Қазақстан)  
**Сатаев М.И.** проф., корр.-мүшесі (Қазақстан)  
**Северский И.В.** проф., академик (Қазақстан)  
**Сикорски Марек** проф., (Польша)  
**Рамазанов Т.С.** проф., академик (Қазақстан)  
**Такибаев Н.Ж.** проф., академик (Қазақстан), бас ред. орынбасары  
**Харин С.Н.** проф., академик (Қазақстан)  
**Чечин Л.М.** проф., корр.-мүшесі (Қазақстан)  
**Харун Парлар** проф. (Германия)  
**Энджун Гао** проф. (Қытай)  
**Эркебаев А.Э.** проф., академик (Қырғыстан)

«Қазақстан Республикасы Ұлттық ғылым академиясының баяндамалары»

ISSN 2518-1483 (Online),

ISSN 2224-5227 (Print)

Меншіктенуші: «Қазақстан Республикасының Ұлттық ғылым академиясы» Республикалық қоғамдық бірлестігі (Алматы қ.)  
Қазақстан республикасының Мәдениет пен ақпарат министрлігінің Ақпарат және мұрағат комитетінде 01.06.2006 ж.  
берілген №5540-Ж мерзімдік басылым тіркеуіне қойылу туралы куәлік

Мерзімділігі: жылына 6 рет.

Тиражы: 500 дана.

Редакцияның мекенжайы: 050010, Алматы қ., Шевченко көш., 28, 219 бөл., 220, тел.: 272-13-19, 272-13-18,  
<http://reports-science.kz/index.php/en/archive>

© Қазақстан Республикасының Ұлттық ғылым академиясы, 2019

Типографияның мекенжайы: «Аруна» ЖК, Алматы қ., Муратбаева көш., 75.

Главный редактор  
д.х.н., проф., академик НАН РК **М. Ж. Журинов**

Редакционная коллегия:

**Адекенов С.М.** проф., академик (Казахстан) (зам. гл. ред.)  
**Величкин В.И.** проф., чл.-корр. (Россия)  
**Вольдемар Вуйцик** проф. (Польша)  
**Гончарук В.В.** проф., академик (Украина)  
**Гордиенко А.И.** проф., академик (Беларусь)  
**Дука Г.** проф., академик (Молдова)  
**Илолов М.И.** проф., академик (Таджикистан),  
**Леска Богуслава** проф. (Польша),  
**Локшин В.Н.** проф. чл.-корр. (Казахстан)  
**Нараев В.Н.** проф. (Россия)  
**Неклюдов И.М.** проф., академик (Украина)  
**Нур Изура Удзир** проф. (Малайзия)  
**Перни Стефано** проф. (Великобритания)  
**Потапов В.А.** проф. (Украина)  
**Прокопович Полина** проф. (Великобритания)  
**Омбаев А.М.** проф., чл.-корр. (Казахстан)  
**Отелбаев М.О.** проф., академик (Казахстан)  
**Садыбеков М.А.** проф., чл.-корр. (Казахстан)  
**Сатаев М.И.** проф., чл.-корр. (Казахстан)  
**Северский И.В.** проф., академик (Казахстан)  
**Сикорски Марек** проф., (Польша)  
**Рамазанов Т.С.** проф., академик (Казахстан)  
**Такибаев Н.Ж.** проф., академик (Казахстан), зам. гл. ред.  
**Харин С.Н.** проф., академик (Казахстан)  
**Чечин Л.М.** проф., чл.-корр. (Казахстан)  
**Харун Парлар** проф. (Германия)  
**Энджун Гао** проф. (Китай)  
**Эркебаев А.Э.** проф., академик (Кыргызстан)

Доклады Национальной академии наук Республики Казахстан»

ISSN 2518-1483 (Online),

ISSN 2224-5227 (Print)

Собственник: Республиканское общественное объединение «Национальная академия наук Республики Казахстан» (г. Алматы)

Свидетельство о постановке на учет периодического печатного издания в Комитете информации и архивов Министерства культуры и информации Республики Казахстан №5540-Ж, выданное 01.06.2006 г.

Периодичность: 6 раз в год.

Тираж: 500 экземпляров

Адрес редакции: 050010, г.Алматы, ул.Шевченко, 28, ком.218-220, тел. 272-13-19, 272-13-18

<http://reports-science.kz/index.php/en/archive>

---

©Национальная академия наук Республики Казахстан, 2019 г.

Адрес типографии: ИП «Аруна», г.Алматы, ул.Муратбаева, 75

**E d i t o r i n c h i e f**doctor of chemistry, professor, academician of NAS RK **M.Zh. Zhurinov****E d i t o r i a l b o a r d:****Adekenov S.M.** prof., academician (Kazakhstan) (deputy editor in chief)**Velichkin V.I.** prof., corr. member (Russia)**Voitsik Valdemar** prof. (Poland)**Goncharuk V.V.** prof., academician (Ukraine)**Gordiyenko A.I.** prof., academician (Belarus)**Duka G.** prof., academician (Moldova)**Iolov M.I.** prof., academician (Tadjikistan),**Leska Boguslava** prof. (Poland),**Lokshin V.N.** prof., corr. member. (Kazakhstan)**Narayev V.N.** prof. (Russia)**Nekludov I.M.** prof., academician (Ukraine)**Nur Izura Udzir** prof. (Malaysia)**Perni Stephano** prof. (Great Britain)**Potapov V.A.** prof. (Ukraine)**Prokopovich Polina** prof. (Great Britain)**Ombayev A.M.** prof., corr. member. (Kazakhstan)**Otelbayv M.O.** prof., academician (Kazakhstan)**Sadybekov M.A.** prof., corr. member. (Kazakhstan)**Satayev M.I.** prof., corr. member. (Kazakhstan)**Severskiy I.V.** prof., academician (Kazakhstan)**Sikorski Marek** prof., (Poland)**Ramazanov T.S.** prof., academician (Kazakhstan)**Takibayev N.Zh.** prof., academician (Kazakhstan), deputy editor in chief**Kharin S.N.** prof., academician (Kazakhstan)**Chechin L.M.** prof., corr. member. (Kazakhstan)**Kharun Parlar** prof. (Germany)**Endzhun Gao** prof. (China)**Erkebayev A.Ye.** prof., academician (Kyrgyzstan)**Reports of the National Academy of Sciences of the Republic of Kazakhstan.****ISSN 2224-5227****ISSN 2518-1483 (Online),****ISSN 2224-5227 (Print)**

Owner: RPA "National Academy of Sciences of the Republic of Kazakhstan" (Almaty)

The certificate of registration of a periodic printed publication in the Committee of Information and Archives of the Ministry of Culture and Information of the Republic of Kazakhstan N 5540-Ж, issued 01.06.2006

Periodicity: 6 times a year

Circulation: 500 copies

Editorial address: 28, Shevchenko str., of 219-220, Almaty, 050010, tel. 272-13-19, 272-13-18,

<http://reports-science.kz/index.php/en/archive>

---

© National Academy of Sciences of the Republic of Kazakhstan, 2019

Address of printing house: ST "Aruna", 75, Muratbayev str, Almaty

**DEVELOPMENT OF INFRASTRUCTURAL LINKS  
OF INNOVATIVE SYSTEM KAZAKHSTAN IN THE CONDITIONS  
OF FORMATION OF SCIENTIFIC ECONOMY**

S. Toraighyrov Pavlodar state University  
[b.korgan@asu.edu.kz](mailto:b.korgan@asu.edu.kz)

**Abstract.** Formation of the organization of innovation in the Republic of Kazakhstan is one of the leading places in the development of the country itself. In Kazakhstan, the last few years, interest in innovation has grown very significantly - even at the level of the government, measures to stimulate innovation have been taken. Innovation activity in Kazakhstan has not yet received the theoretical and practical level that would help overcome the technological gap, change the nature and production volumes in all sectors of the economy. This article identifies the functional role of NIS RK, as well as each of its subsystems in the formation of an innovation-type economy. The data on the development of the scientific and technical system, innovation infrastructure and innovation activities of the country are presented.

**Keywords:** infrastructure, links, innovations, system, knowledge-intensiveness, business.

**INTRODUCTION**

In order for Kazakhstan to enter, on the terms of an equal partner, into the world community, it is necessary to determine the range of macro-technologies by which it can become competitive in the international market for high technology products. Thus, the laid theoretical and methodological foundations of innovation activity require further development and generalization. In this regard, this article reveals the features of the introduction of advanced technologies, also in the work examines the experience of foreign countries in the implementation of innovations in practice.

For example, in the American business, focused on the creation of innovations and the introduction of innovations, two types of entrepreneurship are combined: financial and actually innovative. In accordance with this specialized activity in the production of promotion of new products to the market, venture (risk) capital companies and innovative firms are engaged. Specialized venture capital firms play the main role in financing innovations. Organizationally, such companies are a combination of managers of small firms and financial pools managed by them, each of which integrates the funds of several investors. In addition, companies often practice the so-called "distributed risk", the essence of which is that a large company invests its capital in a project of not just one small innovative firm, but distributes it among several projects. On the one hand, it significantly reduces the riskiness of investments, and on the other hand, it provides sources of financing not for one, but for several firms. However, projects for funding are selected very carefully and, on average, only 1-2 out of every 10 investment requests are satisfied. In recent decades, "quasi-risky" forms of their organization at the level of a corporation: internal ventures and svoyak programs have been recognized as the most effective methods for accelerating innovation processes in the United States. US specific form; The Svoryak program provides for the approval of special monetary funds, the funds from which are allocated to Slavs, representatives of internal corporate risk capital. Any employee of the corporation, who proposed the idea of a new product, can apply directly to the "brother-in-law" for financial support. If the proposal turns out to be interesting, funds can be allocated (up to several hundred thousand dollars) for the development and implementation of an innovative project. "Svayaki" participate in the income of the corporation, receiving money, securities, or a percentage of the profits for each successful innovative project. Thus, the restructuring of the organizational structure of a large American company General Motor in order to increase the effectiveness

of innovation management is indicative. Another example of foreign experience in innovation is Japanese companies. Innovation as a product of intellectual activity cannot arise spontaneously. For the generation and introduction of innovations into practice, certain conditions are required - the presence of all institutions that contribute to the implementation of innovations, as well as the degree of their development and interaction among themselves. The combination of participants in the innovation process and the degree of institutional interaction of institutions form a certain system with specific features from country to country. In economics, this system, inherent in a particular country, is called the national innovation system (NIS).

## MAIN PART

By the end of the twentieth century, it became obvious that the level of development of the science and technology sphere - science, education, knowledge-intensive industries, world technology markets - defines the boundaries between rich and poor countries, creates the basis for economic growth, is the most important factor in solving social problems.

Table 1 - Ranking of countries in the world according to the 2018 innovation index [4]

RATING	A COUNTRY	INDEX
1	Switzerland	68.40
2	Netherlands	63.32
3	Sweden	63.08
4	Great Britain	60.13
5	Singapore	59.83
43	Ukraine	38.52
46	Russia	37.90
59	Georgia	35.05
68	Armenia	32.81
74	Kazakhstan	31.42
80	Azerbaijan	30.20
86	Belarus	29.35
94	Kyrgyzstan	27.56

Table 2 - Costs of technological innovations in industry, mln. Tenge

	2016	2017	2018
The Republic of Kazakhstan	170174,3	168477,1	219263,3
Akmola	3626,8	6567,9	8891,4
Aktobe	29374,1	52788,3	43305,3
Almaty	1542,1	1780,3	5625,5
Atyrau	14265,6	14288,1	20488,1
West Kazakhstan	46888,2	1364,3	8203,1
Zhambylskaya	8244,9	16530,8	15041,7
Karaganda	6900,9	4989,7	25168,0
Kostanay	526,4	1884,0	13676,1
Kyzylorda	2673,5	3738,5	4325,5
Mangystau	414,9	9041,5	5962,0
South Kazakhstan	13912,6	3732,9	18388,5
Pavlodar	6995,0	4136,8	12064,9
North Kazakhstan	63,7	7675,6	5986,7
East Kazakhstan	30366,8	23211,2	24930,2
Astana	1218,4	12636,6	5807,6
Almaty city	3160,4	4110,6	1398,3

The state of the country's scientific and technical system depends on the characteristics and level of development of the country's economy, on the effectiveness of the scientific and technical policy pursued.

The main indicators used to analyze the state of the scientific and technical system of Kazakhstan are the standard parameters used in similar studies in the international community: the amount of expenditure on research and development, the number of scientific and technical organizations of the country, their material and technical support, number and qualification scientific personnel of the country, the effectiveness of research and development [2].

The most important indicators characterizing the state of innovative processes in industry are the volumes of innovative products sold and innovative services rendered during the year.

So it is known to distinguish between fundamental and applied research. There is no doubt that basic research is one that has no commercial value at the initial stage. Applied research is deliberately conducted with a focus on a useful (commercial) result. As a consequence, basic science is funded primarily by the state. Without fundamental science there can be no progress.

The most effective in innovation are enterprises with private ownership. At the same time, “pouring” into a private form of state or foreign ownership increases the entrepreneurial activity of organizations in the field of innovation. Entrepreneurial and innovative passivity in Kazakhstan of foreign-owned enterprises is evidence of the absence of an active market environment in the country;

The increase in the volume of sold innovative products and the volume of rendered innovative services indicates the demand for domestic innovative products on the market. It should be noted that domestic innovative products are in demand not only in the domestic market, but also in the foreign market, which is a positive circumstance from the point of view of further increasing the output of innovative products and the development of foreign markets.

The implementation of the Strategy also gave impetus to the formation and development of technology parks of national and regional scale.

One of the first and most significant objects of the innovation infrastructure is the free economic zone “Park of Information Technologies” in the Alatau settlement, Almaty oblast. The purpose of creating a national park is:

- development of the information technology industry;
- activation of the entry of the economy of the Republic of Kazakhstan into the system of world economic relations;
- creation of high-performance, including high-tech and export-oriented industries, mastering the release of new types of information technology products, attracting investment [8].
- It is important to ensure the economic freedom of economic entities in the Republic of Kazakhstan is the implementation in practice of the provisions of the legislative documents, in particular that guarantees the unity of the economic space, the free movement of goods, services, funds, support for competition, freedom of economic activity.
- Modern state legislation guarantees the freedom of economic activity of small businesses, with the exception of conducting illegal business, pseudo-business or illegal banking activities.
- It is independence and economic freedom, as obligatory characteristic features of small business and indispensable conditions for its development, that mean the following: autonomy of individuals in organizing their own business in any economic field other than prohibited by law, free choice of the subject matter and type of business rights and guarantees that allow them to organize and develop their business, use its results at their discretion in accordance with the constituent documents and regulations [6].
- At the same time, the independence and economic freedom of small businesses should not mean their willfulness, therefore, the legislation establishes measures of state regulation of entrepreneurial activity and the responsibility of entrepreneurs for violating relevant regulatory acts, which is economically and legally justified. Limits of restriction of economic freedom are established by the action of regulatory acts. As a fundamental principle, we note
- that entrepreneurship should develop on the basis of its decision-making by its subjects within the law, and the state should not interfere in the specific business life of entrepreneurs.
- We point out that even the classics of economic theory wrote about economic freedom as the main condition for the development of entrepreneurship, and mostly opposed state intervention in the economic activities of entrepreneurs.

- The history of the development of modern Western economies confirms the effective practice of free enterprise development, when freedom of production, independence of choice of activities, freedom of choice of the sales market and freedom of consumption become fundamental conditions for the development of free entrepreneurship.

## CONCLUSION

Undoubtedly, in a market economy there can be no absolute freedom, and the state, through organizational, legal and economic institutions, should establish, taking into account the interests of the whole society, the optimal limits of economic freedom for business entities, thereby forming a certain economic order.

- This procedure should be characterized by the division in a certain form between the state and individuals, between various state institutions and individuals, the rights to make economic decisions - especially the rights to manage production factors, the rights to make decisions regarding production (i.e., what, in what quantity and quality, where and how it should be implemented) and decision-making rights to meet needs. Revenues, and thus the actually existing degree of freedom of economic activities, should also be distributed in a certain way in society.

- Currently, in the Republic of Kazakhstan, the formation of a new economic order necessitates the granting of large economic freedoms to economic entities. This, in particular, is explained by the fact that in the process of the economic reforms carried out, the share of enterprises and organizations in state ownership was only 16.3%, and in private ownership already 79.4%. The share of other enterprises that are in other forms of ownership (including foreign), accounts for a small percentage. Thus, statistical analysis confirmed that in the economy of Kazakhstan

- The specific weight of enterprises and organizations is dominated by private property, the owners of which have the right to freely manage, in accordance with independent decisions, manage the results of their activities and enjoy broad economic rights.

УДК 330.341

Б. Б. Қорған

### ҒЫЛЫМИ ЭКОНОМИКАНЫ ҢНТАЛУЫ ЖАҒДАЙЫНДА ҚАЗАҚСТАННЫҢ ИННОВАЦИЯЛЫҚ ЖҮЙЕСІН ИНФРАҚҰРЫЛЫМДЫҚ СІЛТЕМЕЛЕРІН ДАМУЫ

**Аннотация.** Қазақстан Республикасындағы инновацияларды ұйымдастыруды қалыптастыру ел дамуының басты бағыттарының бірі болып табылады. Қазақстанда соңғы бірнеше жылда инновацияға деген қызығушылық айтарлықтай өсті - тіпті үкімет деңгейінде де инновацияларды ынталандыру шаралары қабылданды. Қазақстандағы инновациялық қызмет әлі де теориялық және тәжірибелік деңгейге ие емес, ол технологиялық тапшылығын еңсеруге, экономиканың барлық салаларында табиғат пен өндіріс көлемін өзгертуге мүмкіндік береді. Осы мақалада ҚР ҰҒА-ның функционалды рөлі, сондай-ақ оның кіші жүйелерінің инновациялық экономиканы қалыптастырудағы рөлі көрсетілген. Елдің ғылыми-техникалық жүйесін, инновациялық инфрақұрылымын және инновациялық қызметін дамыту туралы мәліметтер келтірілген.

**Түйін сөздер:** инфрақұрылым, сілтемелер, инновациялар, жүйе, білімнің қарқындылығы, бизнес.

УДК 330.341

Б. Б. Қорған

### РАЗВИТИЕ ИНФРАСТРУКТУРНЫХ ЗВЕНЬЕВ ИННОВАЦИОННОЙ СИСТЕМЫ КАЗАХСТАН В УСЛОВИЯХ СТАНОВЛЕНИЯ НАУКОЕМКОЙ ЭКОНОМИКИ

**Аннотация.** Становление организации инновационной деятельности в Республике Казахстан занимает одно из ведущих мест в развитии самой страны. В Казахстане, последние несколько лет интерес к инновациям вырос очень существенно – даже на уровне правительства стали приниматься меры по стимулированию инновационной деятельности. Инновационная деятельность в Казахстане пока не получила того теоретического и практического уровня, который способствовал бы преодолению технологического отставания, изменению характера и объемов производства во всех сферах экономики. В данной статье выявлена функциональная роль НИС РК, а также каждой из ее подсистем в формировании экономики инновационного типа. Представлены данные о развитии научно-технической системы, инновационной инфраструктуры и инновационной деятельности страны

**Ключевые слова:** инфраструктура, звенья, инновации, система, наукоемкость, бизнес.



**Information about author:**

Korgan B. B. - S. Toraighyrov Pavlodar state University, b.korgan@asu.edu.kz; <https://orcid.org/0000-0001-7545-5075>

**REFERENCES**

- [1] Ivanova N. National Innovation Systems // Issues of Economics. № 7. p. 59-70.
- [2] Kembaev B.A. The system of scientific technical information in the Republic of Kazakhstan: state and development prospects. Almaty: KazgosINTI, 2003. 434 p.
- [3] Deryagin A.V. Science and innovative economy in Russia // Innovations. 2005. №5. p. 26-15.
- [4] stat.kz
- [5] Sadykov A. Principles and priorities for the modernization of the national economic system // Sayasat. 2007. № 9. p. 46-48.
- [6] Dyusembaeva L.K., Babazhanova Zh.A., Bulakbay Zh.M., Nurbayeva G.Ye. Strategy of interaction of the state and small business as a factor of innovative development. N E W S OF THE NATIONAL ACADEMY OF SCIENCES OF THE REPUBLIC OF KAZAKHSTAN SERIES OF SOCIAL AND HUMAN SCIENCES ISSN 2224-5294, Volume 1, Number 323 (2019), 107 – 116. <https://doi.org/10.32014/2019.2224-5294.16>

**Publication Ethics and Publication Malpractice  
in the journals of the National Academy of Sciences of the Republic of Kazakhstan**

For information on Ethics in publishing and Ethical guidelines for journal publication see <http://www.elsevier.com/publishingethics> and <http://www.elsevier.com/journal-authors/ethics>.

Submission of an article to the National Academy of Sciences of the Republic of Kazakhstan implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see <http://www.elsevier.com/postingpolicy>), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. In particular, translations into English of papers already published in another language are not accepted.

No other forms of scientific misconduct are allowed, such as plagiarism, falsification, fraudulent data, incorrect interpretation of other works, incorrect citations, etc. The National Academy of Sciences of the Republic of Kazakhstan follows the Code of Conduct of the Committee on Publication Ethics (COPE), and follows the COPE Flowcharts for Resolving Cases of Suspected Misconduct ([http://publicationethics.org/files/u2/New\\_Code.pdf](http://publicationethics.org/files/u2/New_Code.pdf)). To verify originality, your article may be checked by the originality detection service Cross Check <http://www.elsevier.com/editors/plagdetect>.

The authors are obliged to participate in peer review process and be ready to provide corrections, clarifications, retractions and apologies when needed. All authors of a paper should have significantly contributed to the research.

The reviewers should provide objective judgments and should point out relevant published works which are not yet cited. Reviewed articles should be treated confidentially. The reviewers will be chosen in such a way that there is no conflict of interests with respect to the research, the authors and/or the research funders.

The editors have complete responsibility and authority to reject or accept a paper, and they will only accept a paper when reasonably certain. They will preserve anonymity of reviewers and promote publication of corrections, clarifications, retractions and apologies when needed. The acceptance of a paper automatically implies the copyright transfer to the National Academy of sciences of the Republic of Kazakhstan.

The Editorial Board of the National Academy of sciences of the Republic of Kazakhstan will monitor and safeguard publishing ethics.

Правила оформления статьи для публикации в журнале смотреть на сайте:

[www.nauka-nanrk.kz](http://www.nauka-nanrk.kz)

**ISSN 2518-1483 (Online), ISSN 2224-5227 (Print)**

<http://reports-science.kz/index.php/en/archive>

Редакторы *М. С. Ахметова, Т.А. Апендиев, Д.С. Аленов*  
Верстка на компьютере *А.М. Кульгинбаевой*

Подписано в печать 12.08.2019.  
Формат 60x881/8. Бумага офсетная. Печать – ризограф.  
11 п.л. Тираж 500. Заказ 4.