ISSN 2518-170X (Online),
ISSN 2224-5278 (Print)

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫ
Satbayev University

ХАБАРЛАРЫ

ИЗВЕСТИЯ

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК
РЕСПУБЛИКИ КАЗАХСТАН
Satbayev University

NEWS

OF THE ACADEMY OF SCIENCES
OF THE REPUBLIC OF KAZAKHSTAN
Satbayev University

SERIES
OF GEOLOGY AND TECHNICAL SCIENCES

5 (449)

SEPTEMBER – OCTOBER 2021

THE JOURNAL WAS FOUNDED IN 1940

PUBLISHED 6 TIMES A YEAR

ALMATY, NAS RK

NAS RK is pleased to announce that News of NAS RK. Series of geology and technical sciences scientific journal has been accepted for indexing in the Emerging Sources Citation Index, a new edition of Web of Science. Content in this index is under consideration by Clarivate Analytics to be accepted in the Science Citation Index Expanded, the Social Sciences Citation Index, and the Arts & Humanities Citation Index. The quality and depth of content Web of Science offers to researchers, authors, publishers, and institutions sets it apart from other research databases. The inclusion of News of NAS RK. Series of geology and technical sciences in the Emerging Sources Citation Index demonstrates our dedication to providing the most relevant and influential content of geology and engineering sciences to our community.

Қазақстан Республикасы Ұлттық ғылым академиясы «ҚР ҰҒА Хабарлары. Геология және техникалық ғылымдар сериясы» ғылыми журналының Web of Science-тің жаңаланған нұсқасы Emerging Sources Citation Index-те индекстелуге қабылданғанын хабарлайды. Бұл индекстелу барысында Clarivate Analytics компаниясы журналды одан әрі the Science Citation Index Expanded, the Social Sciences Citation Index және the Arts & Humanities Citation Index-ке қабылдау мәселесін қарастыруда. Webof Science зерттеушілер, авторлар, баспашылар мен мекемелерге контент тереңдігі мен сапасын ұсынады. ҚР ҰҒА Хабарлары. Геология және техникалық ғылымдар сериясы Emerging Sources Citation Index-ке енуі біздің қоғамдастық үшін ең өзекті және беделді геология және техникалық ғылымдар бойынша контентке адалдығымызды білдіреді.

НАН РК сообщает, что научный журнал «Известия НАН РК. Серия геологии и технических наук» был принят для индексирования в Emerging Sources Citation Index, обновленной версии Web of Science. Содержание в этом индексировании находится в стадии рассмотрения компанией Clarivate Analytics для дальнейшего принятия журнала в the Science Citation Index Expanded, the Social Sciences Citation Index и the Arts & Humanities Citation Index. Web of Science предлагает качество и глубину контента для исследователей, авторов, издателей и учреждений. Включение Известия НАН РК. Серия геологии и технических наук в Emerging Sources Citation Index демонстрирует нашу приверженность к наиболее актуальному и влиятельному контенту по геологии и техническим наукам для нашего сообщества.

«ҚР ҰҒА Хабарлары. Геология және техникалық ғылымдар сериясы».
ISSN 2518-170X (Online),
ISSN 2224-5278 (Print)
Меншіктеуші: «Қазақстан Республикасының Ұлттық ғылым академиясы» РҚБ (Алматы қ.).
Қазақстан Республикасының Ақпарат және қоғамдық даму министрлігінің Ақпарат комитетінде 29.07.2020 ж. берілген **№ KZ39VPY00025420** мерзімдік басылым тіркеуіне қойылу туралы куәлік.
Тақырыптық бағыты: *геология, мұнай және газды өңдеудің химиялық технологиялары, мұнай химиясы, металдарды алу және олардың қосындыларының технологиясы.*
Мерзімділігі: жылына 6 рет.
Тиражы: 300 дана.
Редакцияның мекен-жайы: 050010, Алматы қ., Шевченко көш., 28, 219 бөл., тел.: 272-13-19
http://www.geolog-technical.kz/index.php/en/

Типографияның мекен-жайы: «Аруна» ЖК, Алматы қ., Мұратбаев көш., 75.

«Известия НАН РК. Серия геологии и технических наук».
ISSN 2518-170X (Online),
ISSN 2224-5278 (Print)

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

Свидетельство о постановке на учет периодического печатного издания в Комитете информации Министерства информации и общественного развития Республики Казахстан **№ KZ39VPY00025420,** выданное 29.07.2020 г.

Тематическая направленность: *геология, химические технологии переработки нефти и газа, нефтехимия, технологии извлечения металлов и их соеденений.*

Периодичность: 6 раз в год.

Тираж: 300 экземпляров.

Адрес редакции: 050010, г. Алматы, ул. Шевченко, 28, оф. 219, тел.: 272-13-19
http://www.geolog-technical.kz/index.php/en/

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

News of the National Academy of Sciences of the Republic of Kazakhstan. Series of geology and technology sciences.
ISSN 2518-170X (Online),
ISSN 2224-5278 (Print)
Owner: RPA «National Academy of Sciences of the Republic of Kazakhstan» (Almaty).
The certificate of registration of a periodical printed publication in the Committee of information of the Ministry of Information and Social Development of the Republic of Kazakhstan **No. KZ39VPY00025420,** issued 29.07.2020.
Thematic scope: *geology, chemical technologies for oil and gas processing, petrochemistry, technologies for extracting metals and their connections.*
Periodicity: 6 times a year.
Circulation: 300 copies.
Editorial address: 28, Shevchenko str., of. 219, Almaty, 050010, tel. 272-13-19
http://www.geolog-technical.kz/index.php/en/

Address of printing house: ST «Aruna», 75, Muratbayev str, Almaty.

NEWS
OF THE NATIONAL ACADEMY OF SCIENCES OF THE REPUBLIC OF
KAZAKHSTAN **SERIES OF GEOLOGY AND TECHNICAL SCIENCES**
ISSN 2224-5278
Volume 5, Number 449 (2021), 54-60 ***https://doi.org/10.32014/2021.2518-170X.98***

UDC 502:62-229.88
IRSTI 87.21.05

Ismailov B.A., Dossaliev K.S.

M. Auezov South Kazakhstan University, Shymkent, Kazakhstan.
E-mail: *baxa-86_8@mail.ru*

TECHNOLOGICAL REGULATIONS OF CONDITIONS IN PRODUCTION OF FERTILIZER MIXTURES "ZHAMB-70"

Abstract. A study of the chemical composition of industrial wastes of various industries was conducted, which can be used instead of natural raw materials for the production of mineral fertilizers. In addition, the use of these wastes through the production of fertilizers, firstly, solves the problem of waste collection and disposal, secondly, reduces the environmental burden in industrial areas and, thirdly, reduces the use of natural resources.

Reducing the amount of waste and recycled materials, reducing the area of industrial waste storage in industrial zones, improving the quality of raw materials and resources through rational and integrated use and introduction of new industrial and innovative technologies are key areas in the economy to solve environmental problems of the regions.

The aim of this work dealt with the issues of reducing environmental burden with the use of industrial wastes as dust cyclone, phosphate fines, internal overburden, dust precipitator of sintering and dust precipitator furnace shop, including neutralization and disposal of harmful solid waste, create environmentally friendly, low - and non-waste technologies are highly relevant. This, in turn, leads to an increase in the use of advanced structural materials, the replacement of expensive materials with cheaper ones, based on the waste of various industries, rational and integrated use of natural and fuel and energy resources, significant involvement in the economic turnover of secondary resources and associated products.

Key words: mineral fertilizers, industrial wastes, cyclone dust, phosphorite particles, internal overburden rocks.

Introduction. Traditionally, simple, compound and complex fertilizers are obtained by decomposition of natural raw materials with strong acids such as sulfuric, hydrochloric and nitric acids, followed by neutralization and the introduction of various additives at different stages of the technological process.

In the Republic of Kazakhstan, there is a lack of measures to establish safety measures and systems at industrial enterprises producing fertilizer mixtures and other fertilizers to neutralize the environmental damage caused by the processing of raw materials in various industries.

In order to prevent environmental problems in the southern regions of the Republic of Kazakhstan and, in general, to increase the supply of mineral fertilizer mixtures and fertilizers for the cultivation and protection of cereals and other agricultural crops for the processing of small wastes generated in the processing of raw materials across the country, and in the structure of medium-sized businesses, it is necessary to develop a system of central management of safety of production facilities and measures that will allow to set goals and objectives.

Based on the mentioned above, we conducted our research on the introduction into the production cycle1,2,3 of complex-mixed multicomponent fertilizers using internal overburden rocks (IOR), obtained during the mining not only in brown coal deposit of the former Lengir settlement but also Karaganda and Ekibastuz coal deposits, except cyclones and electrostatic precipitators after agglomeration of fine particles of natural phosphorite in the phosphorus industry [1-3].

To increase the environmental safety of not only fertilizers, but also products of various crops, it is recommended to include in the compound fertilizer glauconite, which has the ability to absorb 66 to 99%

or more of aqueous solutions of heavy metals and radionuclides. This allows not only to increase iron, zinc, sulfur, magnesium, calcium and other nutrients, but also to obtain multicomponent fertilizers containing other trace elements that fertilize saline soil resources [4,5].

Methods. We propose to build a small workshop that will not harm the environment and residents of the region and other industrial organizations in the processing of environmentally friendly fertilizer mixturess for arable lands on the basis of simple mixing of various natural raw materials contained microelements and man-made wastes with moisture-keeping and absorbing substances and mechanically activated phosphorites.

The study was conducted in two directions:

- Improving the technology of obtaining mechanically and chemically activated compound fertilizers using natural raw materials consisting of macro and micronutrients [6-9];

- There are technologies for obtaining multicomponent complex-mixed fertilizers from the wastes of various enterprises by the acid-free method without the use of the extraction process of natural phosphorus-containing raw materials. One of the most pressing goals is the development of modern technological and technical bases for the production of environmentally friendly compound fertilizers that provide normal vital activity and working conditions in small shops on these technologies.

In this regard, we have studied the possibility of using glauconite with a number of specific properties in the production of compound fertilizers.

Studies on the electron microscope JSM 6390 LV of the Japanese company JOES and analysis of the literature on the chemical composition and physical properties of various minerals show that in vermiculite and glauconite, which is an aluminosilicate substance, have calcium, magnesium, iron, potassium, phosphorus, sulfur contains other trace elements in addition to internal overburden rocks. The presence of glauconite in compound fertilizers allows reducing the influx of radionuclides and heavy metals in the root system and stems of vegetable and soybean crops, used in everyday life of the population, as well as in the feed of cattle and sheep [10-11].

Table 1- Elemental composition of glauconite in different rocks

No.	Contained components (in%)	Samples of glauconite in different rocks				
		No.1	No. 2	No. 3	No. 4	No. 5
1	O	55,10	54,85	49,06	55,37	55,12
2	Na	0,19	0,20	0,14	0,21	0,13
3	Mg	0,60	0,77	0,56	0,80	0,77
4	Al	12,40	11,30	8,88	11,53	11,41
5	Si	26,43	27,96	23,22	27,31	26,45
6	K	2,60	2,15	1,18	2,24	3,02
7	Ca	0,29	0,24	0,29	0,27	0,08
8	Ti	0,91	0,67	0,54	0,65	0,75
9	Fe	1,48	1,86	15,89	1,63	2,28
10	Mn	-	-	0,23	-	-

Products generated as waste at the Zhana Zhambyl Phosphorus Plant are highly digestible phosphorus, despite the fact that due to their chemical composition, the content of $P_2O_5$from natural phosphorus-containing raw materials is lower [12-13].

Depending on these achievements, it is necessary to know the composition of the raw materials' mixtures used in the construction of this small shop. In this regard, it is necessary to analyze the raw materials required for the production of compound fertilizers.

The composition of the elements in the phosphate part of the feedstock, especially the fine phosphorite, cyclone and electrostatic precipitators formed during the production of agglomerate, as well as the IOR of different rocks of vermiculite and lignite are given in Table 2 [14].

Table 2 - The composition of the elements in the phosphate part of the raw material

No.	Contained components (in%)	Name							
		Cyclone dust	Dust from the electrostatic precipitator	Electric filter furnace dust	Fine phosphorite	Vermiculite	Ekibastuz IOR	Lenger IOR	Karaganda IOR
1	C	23,95	17,73	41,92	7,10	-	27,79	26,73	32,08
2	F	3,26	1,91	-	2,26	-	-	-	-
2	Na	0,33	0,29	1,10	0,15	0,11	0,27	-	0,16
3	Mg	1,21	1,31	0,35	1,93	8,63	0,46	0,20	0,40
4	Al	2,14	2,42	0,44	1,17	7,82	6,01	6,45	5,15
5	Si	8,27	9,59	3,14	8,53	17,42	12,77	12,97	11,44
6	S	0,49	0,26	-	0,16	-	1,05	1,50	1,12
7	K	1,19	1,25	10,20	0,72	3,04	1,14	1,01	0,97
8	Ca	13,98	16,12	2,65	22,62	2,12	1,54	0,96	1,58
9	Ti	0,24	0,19	-	-	1,42	0,29	0,37	0,28
10	Fe	2,13	1,58	1,05	1,16	13,28	3,24	3,17	2,83
11	Cl	0,31	-	0,21	-	0,27	-	-	-
12	P	4,44	5,31	9,71	7,42	-	-	-	-
13	Zn	-	-	0,43	-	-	-	-	-
14	Mn	-	-	-	0,25	-	-	-	-

Analysis of Table 2 shows that the mixture contains microelements, which are necessary for plants, like sulfur, titanium, magnesium, potassium, carbon etc. There is no doubt that the presence of them is very important for plants.

As determined by the works of the authors [10]; Physicochemical properties of glauconite reduce the content of heavy metals such as As, Pb, Mg and other elements from 64% to 99%, and radionuclides - from 95-97% in aqueous solution, and it is a good food for various animals. were found to be additives.

In this regard, the purpose is to improve the optimal technological composition of fertilizer mixtures based on complex-mixed fertilizers “ZHAMB-70”, which contain a moisture-retaining substance, trace elements and humates.

In addition to the mechanically and chemically activated properties of the phosphate part of the fertilizer mixture, this allows to obtain a new range of mineral fertilizers in emergencies through the introduction of radionuclide-absorbing glauconite to increase the safety of heavy metals and radionuclides.

In order to address these pressing issues, based on the research of a number of chemical technologists, a new range of “JAMB-70” fertilizer mixtures was found as a result of research, which absorbs nitrates of heavy metals and aqueous solutions with a moisture retardant and radionuclides containing glauconite and increases the safety of human life and environment [2].

The effective content of glauconite in it should not be less than 5% and not more than 10%. Outside of these limits, other properties of the additive may change, affecting its intended function.

It includes not only sanitary and hygienic, but also other technical aspects of the temperature in the working room, safety, ventilation, lighting and fire safety standards, the requirements for the reuse of waste in the technological process, as well as the possibility of maximum concentration and limit stones to avoid harm to the environment. accompanied by storage [15].

Therefore, in the second area of research, research is being conducted on the development and establishment of small businesses, providing comfort to service personnel.

As a result of research, the following relationships between raw materials were identified [16].

Table 3 - Optimal production parameters of “ZHAMB-70”

No.	Phosphorite fine or agglomerated cyclone dust	Electric filter dust	The third small appearance of the furnace shop	Vermiculite	IOR
1	71	3	2	12	12

2	79	3	2	8	8
3	75	3	2	10	10
4	75	3	2	12	8
5	75	3	2	8	12
6	72	3	2	13	10
7	74	4	3	11	8
8	77	4	2	8	9
9	77	3	3	9	8
10	78	2	4	8	8
Average:	75	3	2	10	10

Results and Discussion. According to the plan for the production of "ZHAMB-70" in order to increase the quality and volume of finished products of crops of small, medium and individual entrepreneurs in the Republic of Kazakhstan in the regions and districts of those regions, or in 3-4 districts, It is planned to build small enterprises producing at least 18 thousands of tons of fertilizer mixture a year.

As a result, the research conducted an analysis of the real magnitude of the emergency situation in the Turkestan region, and the data of the analytical analysis are given below.

At M. AuezovSouth Kazakhstan University an experimental planthas been developed for the production of 500 kg of fertilizer mixture per hour. In this unit, the most efficient modes of technology are identified. The experimental plantis shown in Figure 1 [17-19].

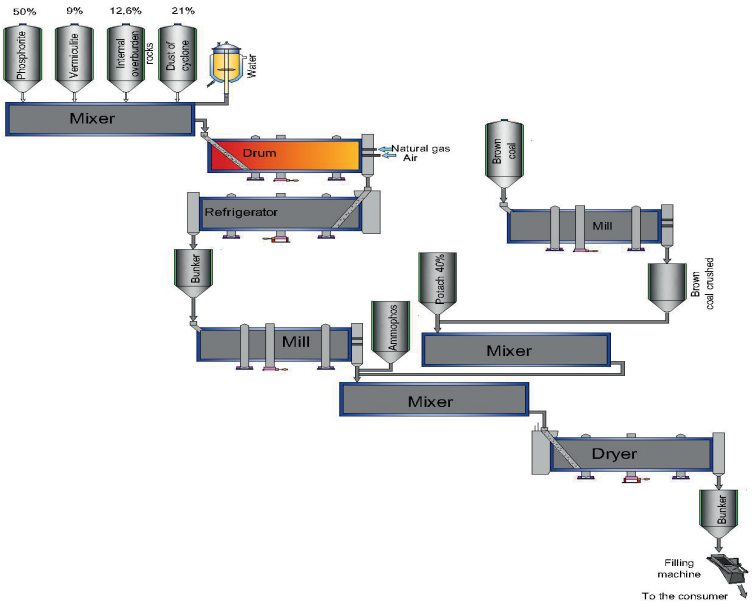

Figure 1 - Technological model for the production of "ZHAMB-70"

According to the model of the equipment shown in Figure 1, technologically efficient procedures for the production of "ZAMB-70" in the practical conditions of production are identified.

The life-threatening nature of the equipment and small businesses and the environment, the personnel serving the premises, the optimality of solutions to eliminate or reduce dust, hazards are aimed at facilitating the work of emergency workers in local areas, regions and districts.

If local decisions are made to design this production, it is necessary to take a number of measures and decisions on the environment of the production facility, the proximity of rural areas, the safety of production workers and service personnel.

Crushed material up to 10 micron grade, containing phosphorus-potassium-humus, vermiculite and trace elements, is fed into a two-shaft mixer for thorough mixing and then transported to the combined mixer hopper. "ZAMB-70" complex mixed fertilizer enters the packing machine from the collection hopper.

Conclusion. During the experimental tests, the main technological parameters and thermal-technological procedures for obtaining long-acting "ZHAMB-70" fertilizer mixture on environmental and technological safety were identified.

Phosphorus-containing substances (third return):
- dust of small phosphorite or sinter cyclone - 75%;
- dust from electric filters - 3%;
- vermiculite - 10%;
- internal stripping rocks - 10%;
- The third small appearance of the furnace shop - 2%.

The following optimal thermal technical parameters were identified during the production of "ZHAMB-70":
- disconnect 3-5 mm of water at the top of the oven;
- temperature in the firing zone-800-900°C;
- exhaust gas temperature 250-300°C;
- water disconnection 180-200 mm before the smoke extractor.
- degree of purification of dust-gas mixture not less than 95%;
- gas pressure in the injector is 0.8-1.5 kgf/cm^2;
- cooling of the material in the refrigerator up to 400°C.

In the course of experimental and industrial tests, a fundamental possibility of obtaining a long-acting fertilizer "ZHAMB-70" for an agricultural complex close to farms within a radius of 50 km was identified.

During the experimental tests, the following basic technological parameters for the production of long-acting "ZHAMB-70" fertilizer mixture were determined: phosphorus-containing substances (third return); dust of cyclones 10; dust of electric filters-10) -60-65; vermiculite -9-11; internal overburden rocks-8-10; brown coal -9-11 and patosh K_2CO_3 – 9-11.

The following optimal thermal technical parameters were determined during the production of "ZHAMB-70" fertilizer mixture: temperature in the firing zone-800-900°C; exhaust gas temperature 250-300°C; cooling of the material in the cooler with a gas pressure of 0.8-1.5 kgf/cm^2 and up to 400°C.

The mixed raw material enters the kiln. It is necessary to organize fire safety measures, as the firing temperature is 800-900°C. To do this, fire alarms and fire sensors were placed in the scheme in accordance with the size of the production site. The installed fire alarm system must be connected to central control devices.

Исмаилов Б.А., Досалиев Қ.С.

М. Ауэзов атындағы Оңтүстік Қазақстан университеті, Шымкент, Қазақстан
E-mail: *baxa-86_8@mail.ru*

«ЖАМБ-70» ТУКОҚОСПА ШЫҒАРУДАҒЫ ӨНДІРІСТІК ЖАҒДАЙЫНЫҢ ТЕХНОЛОГИЯЛЫҚ ТӘРТІПТЕРІ

Аннотация. Мақалада минералды тыңайтқыштар алу үшін табиғи шикізаттың орнына пайдалануға болатын әртүрлі өндірістердің өнеркәсіптік қалдықтарының химиялық құрамын зерттеу жүргізілді. Сонымен қатар, осы қалдықтарды тыңайтқыш алу арқылы пайдалану, біріншіден, қалдықтарды жинау және көму проблемасын шешеді, екіншіден, өнеркәсіптік аймақтардағы экологиялық жүктемені азайтады және үшіншіден, табиғи ресурстарды пайдалануды азайтады.

Экономикада қалдықтар мен қайталама материалдардың санын азайту, өндірістік аймақтардағы өнеркәсіптік қалдықтарды сақтау алаңдарын азайту, жаңа өнеркәсіптік және инновациялық технологияларды енгізу, ұтымды және кешенді қолдану арқылы шикізат пен ресурстардың сапасын жақсарту сияқты негізгі бағыттарды пайдалану құрылыс экономикасының әр түрлі салаларының жұмыс істеуінің сенімді механизмін құруға және еліміздің өнеркәсіптік аймақтарының экологиялық мәселелерін шешуге мүмкіндік береді.

Сонымен қатар, жасалынған жұмыста біз фосфор өнеркәсібінде табиғи фосфоритті майда ұсақтарын агломерация тәсілімен кесектегенде циклондар мен электрсүзгілердің ұнтақты шаң тозаңдары сияқты техногендік қалдықтарымен қатар, бұрынғы Леңгір мекенжайының қоңыр көмір кен орындарының ғана емес, сонымен қатар Қарағанды және Екібастұз көмір туынды мекендерінің терикондар түріндегі көмір өндіргенде ішкі қазба жыныстарын (ІҚЖ) қолдана күрделі-аралас көпкомпонентті тыңайтқыштарын алу өндірістік циклына ендіру бойынша зерттеу жұмыстарын жүргіздік.

Түйінді сөздер: минералды тыңайтқыштар, өндірістік қалдықтар, циклон шаңы, фосфорит ұнтағы, ішкі қазба жыныстары.

Исмаилов Б.А., Досалиев К.С.

Южно-Казахстанский университет имени М. Ауэзова, Шымкент, Казахстан.
E-mail: *baxa-86_8@mail.ru*

ТЕХНОЛОГИЧЕСКИЕ РЕЖИМЫ ПРОИЗВОДСТВЕННЫХ УСЛОВИЙ РАЗРАБОТКИ ТУКОСМЕСИ «ЖАМБ-70»

Аннотация. Проведены исследования по изучению химического состава промышленных отходов различных производств, которые могут быть использованы взамен природного сырья для получения минерального удобрения.Кроме того, использование данных отходов с получением удобрений, во-первых, решает проблему складирования и захоронения отходов, во-вторых, снижает экологическую нагрузку в промышленных регионах и, в-третьих, сокращает использование природных ресурсов.

Использование таких основных направлений в экономике, как бережное отношение к ресурсам за счет сокращения количества отходов и вторичных материалов, сокращение площадей хранения промышленных отходов в производственных регионах, внедрение новых промышленных и инновационных технологий, повышение качества сырья, ресурсов за счет их рационального и комплексного применения, позволяет создать надежный механизм функционирования различных отраслей строительной экономики и решить экологические проблемы промышленных регионов нашей страны.

Кроме того, были проведены исследовательские работы по внедрению в производственный цикл получения сложных комбинированных многокомпонентных удобрений с применением внутренних вскрышных пород при добыче угля в виде терриконов не только месторождений бурых углей бывшего Ленгера, но и производных угля Караганды и Экибастуза, наряду с техногенными отходами, такими как порошковая пыль циклонов и электрофильтров при резке природных фосфоритных мелких частиц агломерационным способом.

Ключевые слова: минеральные удобрения, промышленные отходы, циклонная пыль, частицы фосфорита, внутренние вскрышные породы.

Information about authors:

Ismailov B.A. – Doctoral student of the Department “Life Safety and Environmental Protection” of the M. Auezov South Kazakhstan University, Shymkent, M. Auezov South Kazakhstan University, E-mail: baxa-86_8@mail.ru, *https://orcid.org/0000-0003-0925-5408*;

Dosaliev K.S. – PhD, Associate Professor of the Department “Construction and Building Materials” of the M. Auezov South Kazakhstan University, Shymkent, M. Auezov South Kazakhstan University, E-mail: dosaliev_k@mail.ru, *https://orcid.org/0000-0002-5423-9231*.

REFERENCES

1. Zhantassov K.T., Ismailov B.A., Dossaliyev K.S., Lavrov B.A. (2019) Vestnik KazNRTU 3 (133): 499-504 (in Russ.).
2. Zhantassov K.T., Moldabekov Sh.M., Lavrov B.A., Zhantassov M.K., Kenzhibayeva G.S, Rakhmanberdiyeva Zh., Zhumatayeva S.B., Ismailov B.A. (2018) Development of a small workshop of introduction “ZHAMB-70”tukomixture through absorbing minerals. Proceedings of V International Conference “Industrial Technologies and Engineering - ICITE – 2018”, Shymkent, Kazakhstan, Volume II, P.70.
3. Zhantassov K.T., Nalibayev M.I., Dormeshkin O.B., Moldabekov Sh.M., Zhantassov M.K., Ismailov B.A., Omarov B.T., Kirgizbayev T.K. (2016) Research and experimental tests of the process of extraction of oil-bituminous rocks with obtaining complex-mixed RC fertilizers of prolonged action [Issledovaniya i opytnyye ispytaniya protsessaekstraktsiineftebitumnykhporod s polucheniyem slozhno-smeshannykh RK-udobreniy pro longirovannogo deystviya]. Proceedings of International scientific-practical conference “The path of Kazakhstan: 25 years of peace and creation with the leader of the nation”, Shymkent, Kazakhstan. P.165. (in Russ.).
4. Zhantasov K.T., Shalataev S.Sh., Kadirbayeva A.A., Zhantasova D.M., Ismailov B.A., Dzhanmuldaeva

Zh.K., Petropavlovsky I.A. (2017) Application And Production Ways, Oriental journal of chemistry, Volume 33, 3:1-6. (in Eng.).
5. Zhantasov K.T., Lavrov B.A., Zhantasova D.M., Dossaliev K.S., Ismailov B.A., Zhumadilova Zh.T. (2019) News of the national academy of sciences of the republic of Kazakhstan, series of geology and technical sciences, Volume 1, 433:255–261. (in Eng.).
6. Heffer P., Prud'homme M. (2009) Fertilizer Outlook 2009-2013. Proceedings of 77th IFA Annual Conference, Shanghai, China. P.12.
7. Kustarnikov I.A., Gerassimov Ye.V., Fustochenko A.Yu., Issakov Ye.A. (2013) The procedure for the preparation of fertilizer mixture and methods of its introduction [Poryadok prigotovleniye tukosmesii sposobyyeye vneseniya]. Proceedings of Perspective innovations in education and transport. Stavropol, Russia, P.5. (in Russ.).
8. Mekhanteva L.Ye. (2003) Prevention of the negative impact of the production of mineral fertilizers on the environment and public health [Profilaktika negativnogo vozdeystviya proizvodstva mineral'nykh udobreniy na okruzhayushchuyu sredui zdorov'ye naseleniya], Doctor of Medical Sciences, Thesis, F.F. Erisman Federal Scientific Center for Hygiene, Moscow, Russia (in Russ.).
9. Ridnyi S.D., Ovsyanikov S.A., Kustarnikov I.A. (2013) Fertilization in precision farming technologies [Tukosmeshivaniye v tekhnologiyakh tochnogo zemledeliya]. Proceedings of Swrold. P.69-72. (in Russ.).
10. Andronov S.A., Bykov V.I. (2006) Glauconite - mineral of the future [Glaukonit – mineral budushchego]. Procedings of the First International Conference: The importance of industrial minerals in the world economy: deposits, technology, economic assessment, Moscow, Russia. P.79.
11. Baibotayeva A.D., Kenzhalieva G.D., Zhantasov K.T., Zhantasova M.K., Kocherov E.N. (2021) Study of the effect of heavy metals on soil cover and methods of their bioremediation control.Newsof the national academy of sciences of the republic of Kazakhstan, series of geology and technical sciences. Volume 1, 445:52–57.DOI: 10.32014/2021.2518-170X.8 (in Eng.).
12. Zhantassov K.T., Batyrbek Kh.O., Zhantassov M.K., Frangulidi L.Kh., Kerembayev A.K., Zhuaspayev D.B., Ismailov B.A. (2016) Research on obtaining N-P-K fertilizers from production waste [Issledovaniya po polucheniyu N-P-K udobreniynaosnoveotkhodovproizvodstva]. Proceedings of International Scientific Practical Conference "The path of Kazakhstan: 25 years of peace and creation with the leader of the nation", Shymkent, Kazakhstan. P.160. (in Russ.).
13. Zhantassov K.T., Moldabekov Sh.M., Aibalayeva K.D., Zhantassova D.M., Rakhmanberdiyeva Zh., Ismailov B.A., Zhumadilova Zh.T. (2018) Innovative technologies of mineral fertilizers containing micronutrients [Quramynda mikroelementteri bar mineraldy tynaitqyshtardyn innovaciyalyq texnologiyalary]. Evero, Kazakhstan ISBN 978-9965-618-84-0. (in Kaz.).
14. Yermagambet B.T., Nurgaliyev N.U., Maslov N.A., Abylgazina L.D., Syzdykova A.A. (2020) Effect of electrophysical impact on the physical and chemical characteristics of coal ash from the Maikuben deposit. News of the national academy of sciences of the republic of Kazakhstan, series of geology and technical sciences. Volume 1. 439: 38 – 47. DOI: 10.32014/2020.2518-170X.5 (in Eng.).
15. Order of the Minister for Investment and Development of the Republic of Kazakhstan dated December 30, 2014, No. 345. Registered with the Ministry of Justice of the Republic of Kazakhstan on February 17, 2015 No. 10276. On approval of the Rules for ensuring industrial safety for hazardous production facilities of the chemical industry. (in Russ.).
16. Kustarnikov I.A., Gerassimov Ye.V., Fustochenko A.Yu., Issakov Ye.A. (2013) The procedure for the preparation of fertilizer mixture and methods of its introduction [Poryadok prigotovleniye tukosmesi i sposobyye ye vneseniya]. Proceedings of Perspective innovations in education and transport, Stavropol, Russia, P.5. (in Russian).
17. Alpert L.Z. (1976) Chemical Plant Design Basics [Osnovy proyektirovaniya khimicheskikh ustanovok]. "Vysshaya Shkola". Moscow. P.270. (in Russ.).
18. Chyrkun D., Levdanskiy B., Yarmolik S., Golubev V., Zhumadullayev D. (2021) Integrated study of the efficiency of grinding material in an impact-centrifugal mill. News of the national academy of sciences of the republic of Kazakhstan, series of geology and technical sciences. Volume 3, 447:121-128. DOI: 10.32014/2021.2518-170X.74 (in Eng.).
19. Ridnyi S.D., Kustarnikov I.A. (2013) The unit for the differentiated introduction of solid granular fertilizer mixtures [Agregat dlya differentsirovannogo vneseniya tverdykh granulirovannykh tukosmesey]. Proceedings of "Actual problems of scientific and technological progress in the agro-industrial complex". P.257-262. (in Russ.).

МАЗМҰНЫ-СОДЕРЖАНИЕ-CONTENTS

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 described work 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). To verify originality, your article may be checked by the Cross Check originality detection service 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 сайтах:

www:nauka-nanrk.kz

http://www.geolog-technical.kz/index.php/en/

ISSN 2518-170X (Online),
ISSN 2224-5278 (Print)

Редакторы: *М.С. Ахметова, А. Ботанқызы, Д.С. Аленов, Р.Ж. Мрзабаева*
Верстка на компьютере *Г.Д.Жадыранова*

Подписано в печать 15.08.2021.
Формат 60x881/8. Бумага офсетная. Печать – ризограф.
4,6 п.л. Тираж 300. Заказ 4.

Национальная академия наук РК
050010, Алматы, ул. Шевченко, 28, т. 272-13-19