

**«АКАДЕМИК Е.А. БӨКЕТОВ АТЫНДАҒЫ ҚАРАҒАНДЫ ҰЛТТЫҚ  
ЗЕРТТЕУ УНИВЕРСИТЕТІ» КЕАҚ**

**НАО «КАРАГАНДИНСКИЙ НАЦИОНАЛЬНЫЙ  
ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ  
ИМЕНИ АКАДЕМИКА Е.А. БУКЕТОВА**

**KARAGANDA NATIONAL RESEARCH UNIVERSITY NAMED AFTER  
ACADEMICIAN E.A. BUKETOV**

**ТҰРАҚТЫ ДАМУ МАҚСАТТАРЫН ІСКЕ АСЫРУ КОНТЕКСТІНДЕ  
ТҰРМЫСТЫҚ ҚАТТЫ ҚАЛДЫҚТАРМЕН ЖҰМЫС ІСТЕУДІ  
ҚҰҚЫҚТЫҚ РЕТТЕУ: СЫН-ТЕГЕУРІНДЕР МЕН ПЕРСПЕКТИВАЛАР**  
*атты халықаралық ғылыми-практикалық конференцияның*

*Материалдары  
25 қыркүйек 2025ж.*

**ПРАВОВОЕ РЕГУЛИРОВАНИЕ ОБРАЩЕНИЯ С ТВЁРДЫМИ  
БЫТОВЫМИ ОТХОДАМИ В КОНТЕКСТЕ РЕАЛИЗАЦИИ ЦЕЛЕЙ  
УСТОЙЧИВОГО РАЗВИТИЯ: ВЫЗОВЫ И ПЕРСПЕКТИВЫ**

*Материалы  
международной научно-практической конференции  
25 сентября 2025г.*

**LEGAL REGULATION OF MUNICIPAL SOLID WASTE MANAGEMENT  
IN THE CONTEXT OF ACHIEVING THE SUSTAINABLE DEVELOPMENT  
GOALS: CHALLENGES AND PROSPECTS**

*PROCEEDINGS  
of the International scientific and practical conference  
25 September 2025*

Қарағанды, 2025

ӘОЖ 349.6:628

КБЖ 67.407

Т 89

**Тұрақты даму мақсаттарын іске асыру контекстінде тұрмыстық қатты қалдықтармен жұмыс істеуді құқықтық реттеу: сын-тегеуріндер мен перспективалар**

Жинақта 25 қыркүйек 2025ж. Академик Е.А. Бөкетов атындағы Қарағанды университетінің заң факультетінде ұйымдастырылған «Тұрақты даму мақсаттарын іске асыру контекстінде тұрмыстық қатты қалдықтармен жұмыс істеуді құқықтық реттеу: сын-тегеуріндер мен перспективалар» атты халықаралық ғылыми-практикалық(онлайн/оффлайн) конференцияның баяндама материалдары жарияланған. Мақалаларда қазіргі заман үшін өзекті тұрмыстық қатты қалдықтарды басқару, тұрақты даму тұжырымдамасын жүзеге асыру және азаматтардың қолайлы қоршаған ортаға деген құқығын қорғау мәселелері талданған.

Конференция нәтижелерінің жинағы заңнаманы жетілдіруге, құқық қолдану тәжірибесін дамытуға және экология саласындағы халықаралық ынтымақтастықты нығайтуға негіз болады.

*Жинақ №АР23490668 «Тұрмыстық қатты қалдықтарды қайта өңдеу және кәдеге жарату: құқықтық мәселелері мен перспективалары» гранты қаражаты есебінен басылды.*

**Правовое регулирование обращения с твёрдыми бытовыми отходами в контексте реализации целей устойчивого развития: вызовы и перспективы:** Материалы международной научно-практической конференции (г. Караганда, 25 сентября 2025 г.). Отв. ред.: А.А. Нукушева, А.Ж. Әбдіжәми. - Карағанды: ТОО «Arko Printing House», 2025. — 356б.

**Ұйымдастыру комитеті – Организационный комитет**

Серикбаев А.М. (төраға), Нукушева А.А. (теңтөраға)

Әбдіжәми А.Ж., Карибаева А.Е., Рустембекова Д.К., Асанова С.Э., Смагулова Т.С. (ұйымдастыру комитеті мүшелері). Жауапты ред.: Нукушева А.А., Әбдіжәми А.Ж.

Сборник подготовлен на основе материалов международной научно-практической конференции (онлайн/оффлайн), состоявшейся 25 сентября 2025 года на тему: «Правовое регулирование обращения с твёрдыми бытовыми отходами в контексте реализации Целей устойчивого развития: вызовы и перспективы», организованной на юридическом факультете Карагандинского университета имени академика Е.А. Букетова.

В статьях сборника анализируются актуальные для современного этапа вопросы обращения с твёрдыми бытовыми отходами, реализации Концепции устойчивого развития, а также защиты прав граждан на благоприятную окружающую среду.

Результаты конференции и представленные материалы станут основой для совершенствования законодательства, развития правоприменительной практики и укрепления международного сотрудничества в сфере экологии и экологического права.

Сборник издан за счёт средств гранта № АР23490668 «Переработка и утилизация твёрдых бытовых отходов: правовые проблемы и перспективы».

УДК 349.6

Материалдар жинағы авторлық басылымда жарияланды. Сборник материалов издан в авторской редакции.

Қарағанды : ТОО “ArkoPrintingHouse”., 100024, Қарағанды қ., Сәтбаев к-сі, 15, Тел. (7212) 35-63-16. E-mail: izd\_karu@buketov.edu.kz

© Академик Е.А. Бөкетов атындағы  
Қарағанды университеті, 2025

**Академик Е.А. Бөкетов атындағы Қарағанды ұлттық зерттеу университетінің заң факультетінің деканы, заң ғылымдарының кандидаты, профессор  
Абзал Мұхаметжанұлы Серикбаевтың**

## **АЛҒЫ СӨЗІ**

### **Құрметті конференция қатысушылары мен қонақтары!**

Бүгін біз «Тұрақты даму мақсаттарын іске асыру контекстінде қатты тұрмыстық қалдықтарды басқарудың құқықтық реттелуі: сын-қатерлер мен перспективалар» тақырыбындағы халықаралық ғылыми-тәжірибелік конференцияны ашып отырмыз.

Конференцияның тақырыбы бүгінгі күннің ең өзекті мәселелерінің бірі болып табылады. Қалдықтарды басқару саласындағы құқықтық қатынастар экологиялық қауіпсіздікті қамтамасыз ету, азаматтардың қолайлы қоршаған ортаға конституциялық құқықтарын жүзеге асыру, сондай-ақ табиғи ресурстарды ұтымды пайдалану қағидаттарына негізделген орнықты экономиканы қалыптастырумен тікелей байланысты.

Біздің форумға Қазақстан, Польша, Ресей, Өзбекстан, Тәжікстан және Украина елдерінің жетекші ғалымдары мен тәжірибелі мамандары қатысуда. Қатысушылардың кең географиясы халықаралық қоғамдастықтың тұрақты даму мен экологиялық құқық мәселелеріне деген қызығушылығының артып келе жатқанын және ғылыми тәжірибе алмасуға деген өзара дайындықты айғақтайды.

Ұсынылған баяндамалар заңнаманы жетілдіру, азаматтық-құқықтық институттарды дамыту, қалдықтарды басқарудағы «жасыл» технологияларды енгізу, цифрландыру және ұлттық нормаларды халықаралық экологиялық стандарттармен үйлестіру секілді кең ауқымды мәселелерді қамтиды.

Бүгінгі талқылаулар экологиялық құқықты жетілдірудің, құқық қолдану тәжірибесін дамытудың және халықаралық ынтымақтастықты нығайтудың маңызды кезеңі болатындығына сенімдімін.

Ұйымдастырушылар атынан барлық қатысушыларға белсенді ұстанымы, қызығушылығы және сындарлы диалогқа дайындығы үшін алғысымызды білдіреміз.

Конференция жұмысына жемісті жұмыс, мазмұнды пікірталастар және тың ғылыми идеялар тілеймін!

## ПРИВЕТСТВЕННОЕ СЛОВО

**Декана юридического факультета Карагандинского национального исследовательского университета имени академика Е.А. Букетова, кандидата юридических наук, профессора Серикбаева Абзала Мухаметжановича**

### **Уважаемые участники и гости конференции!**

Сегодня мы открываем международную научно-практическую конференцию на тему: **«Правовое регулирование обращения с твёрдыми бытовыми отходами в контексте реализации Целей устойчивого развития: вызовы и перспективы»**.

Заявленная тема по праву относится к числу наиболее актуальных направлений современной правовой и экологической повестки. Вопросы обращения с отходами неразрывно связаны с обеспечением экологической безопасности, защитой конституционных прав граждан на благоприятную окружающую среду и построением устойчивой экономики, основанной на принципах рационального природопользования.

Наш форум объединил ведущих учёных и практиков из Казахстана, Польши, России, Узбекистана, Таджикистана и Украины. Такая широкая география участников свидетельствует о возрастающем интересе международного сообщества к проблемам устойчивого развития, а также о готовности к обмену научным и практическим опытом в поиске эффективных правовых механизмов охраны окружающей среды.

Представленные доклады охватывают широкий спектр вопросов — от совершенствования законодательства и развития гражданско-правовых институтов до внедрения «зелёных» технологий, цифровизации управления отходами и гармонизации национальных норм с международными экологическими стандартами.

Уверен, что сегодняшние обсуждения станут важным шагом на пути к совершенствованию правового регулирования в сфере экологии, развитию правоприменительной практики и укреплению международного сотрудничества.

Благодарю всех участников за заинтересованность, активное участие и готовность к открытому диалогу.

Желаю конференции плодотворной работы, конструктивных дискуссий и ярких научных открытий!

**Seilkassymova Roza Askarovna**

*Zhetysu University named after I.Zhansugurov, Taldykorgan, Kazakhstan*

## **TOWARDS THE ISSUE OF RECYCLING MEDICAL WASTE IN KAZAKHSTAN: PROBLEMS AND SOLUTIONS**

To date, the problem of medical waste management is one of the most alarming in the field of ecology and environmental management. But if most waste can still be disposed of relatively safely by depositing, then some types of waste, for example medical waste, are subject to mandatory recycling. They differ significantly from other waste and require special attention. They contain a danger to humans, primarily due to the constant presence in their composition of pathogens of various infectious diseases, toxic, and often radioactive substances.

Disposal of medical waste is quite problematic all over the world. The least technologically advanced disposal methods are not able to eliminate the danger that medical waste poses to the environment. 1 gram of medical waste contains billions of microorganisms with a high ability to survive and reproduce.

Currently, the problem of medical waste disposal is very acute. A unified waste disposal method has not been developed yet. There are quite a variety of different installations on the market that are constantly being improved. However, only part of the waste is recycled, the rest is buried almost without treatment, which can lead to an environmental disaster, which will lead to deterioration in human health. Therefore, it is crucial to study the issue of disposing and recycling medical waste and proposing the ways of tackling this issue. So, the relevance of the research is in the need of a study of tackling the issue related to disposing and recycling medical waste.

*The purpose of the research* is to study the issue of recycling medical waste and propose its solutions.

*The theoretical significance* of the research is that the results of the study might be used when solving the problems related to medical waste.

*The practical significant* of the research is that the results of the study will be used in medical institutions, medical waste recycling companies, and medical waste disposing companies.

Hence, the research leads to make the following hypothesis:

- ***if*** the issue of recycling medical waste is studied and its solutions are offered,
- ***then*** the medical waste will be recycled and disposed properly,
- ***because*** the method of the steam sterilizers will be implemented, waste recycling companies will be established, and the law will be enforced.

Katruxha S.K., Falova O.E. believe that among the factors of potential danger of medical waste for the personnel of medical institutions, the population and the environment. They believe that the risk of infectious contamination; risk of physical injury; risk of toxicity; risk of radioactive damage; environmental risk can be identified as the dangers produced by medical waste [1].

Undoubtedly, the problem of medical waste is being scrutinized, yet the problem has not been addressed properly and still required measures to be tackled. According

to Akimkin V.G. medical waste is waste generated during the operations of healthcare organizations and includes a wide range of materials: used needles and syringes, contaminated clothing, diagnostic samples, blood, chemical, pharmaceutical and radioactive materials, and medical devices. So, medical waste is waste generated in organizations when carrying out medical and/or pharmaceutical activities, performing medical, diagnostic and health procedures [2].

According to the requirements of the Sanitary Rules “Sanitary and Epidemiological Requirements for Healthcare Facilities”, approved by Order of the Minister of Health of the Republic of Kazakhstan No. KR DSM-96/2020 dated 08/11/2020 (hereinafter referred to as the Sanitary Rules), for the collection of each class of medical waste are divided into five classes:

1. class A –non-hazardous, similar to solid household waste, black colored;
2. class B - epidemiologically hazardous waste, yellow colored;
3. class V- extremely epidemiologically hazardous waste, red colored;
4. class G - toxicologically hazardous waste, white colored;
5. class D - radioactive waste.

Medical waste of class “A” is not different in composition with municipal waste and do not have hazardous properties;

Medical waste of class "B" is epidemiologically hazardous medical waste. It is either infected or potentially infected waste. It includes materials and instruments, objects contaminated with blood and other biological fluids, pathological waste, organic surgical waste, food waste from infectious diseases departments, waste from microbiological, clinical diagnostic laboratories, pharmaceutical, immunobiological industries working with microorganisms of III-IV pathogenicity groups, biological waste from vivariums, and live vaccines, unsuitable for use;

Medical waste of class "V" is extremely epidemiologically hazardous medical waste. They include materials that have been in contact with patients with especially dangerous and quarantine infectious diseases, which can lead to emergency situations in the field of sanitary and epidemiological well-being of the population and require measures for sanitary protection of the territory. Besides this, it contains waste from laboratories, pharmaceutical and immunobiological industries working with microorganisms of pathogenicity groups I-II, waste from patients with anaerobic infection and from patients with tuberculosis, and waste from microbiological laboratories working with pathogens of tuberculosis;

Medical waste of class "G" is toxicologically hazardous medical waste. It is cytostatics, diagnostic, and disinfectants that cannot be used, mercury-containing items, devices and equipment, waste of raw materials and products of pharmaceutical production, and waste from the operation of equipment, transport, and lighting systems;

Medical waste of class “D” is radioactive medical waste containing radioactive substances in quantities and concentrations that exceed the regulated values for radioactive substances established by the legislation of the Republic of Kazakhstan in the field of atomic energy [3].

To prevent harm from medical waste, it is mandatory to reduce the amount of waste by choosing medications carefully, separate waste where it is generated, disinfect waste that contains germs, treat chemical waste to make it less harmful, store and transport waste safely, dispose of medical waste in the least harmful way possible, and train safe practices for anyone handling medical waste. Likewise, there is one more method to deal with medical waste of class “A”. It is recycling. Recycling without additional actions is possible only for medical waste of class A. They are considered safe because they have not had contact with the biological fluids of patients and infectious patients and do not contain toxic or radiation components. Some medical waste is often associated with hazard, however, in fact the majority of it is not hazardous. **World Health Organization** highlights that roughly 85% is not considered hazardous [4]. Plastic packaging, glass and plastic, paper and cardboard, food scraps and office products are the prime examples of non-hazardous medical waste. Medical waste of other classes poses a potential threat to humans and nature - epidemiological, toxic, radiation. Therefore, recycling in the usual sense is not acceptable for them. Such waste is disinfected and sent for disposal. According to Khrapunova, I.A., there are several methods for disposing hazardous medical waste:

1. **Method Incineration (combustion).** Using the incineration method, waste of classes B and C is destroyed in special installations using heat treatment, that is, combustion. This method will cause harm in cases where waste is burned in areas not equipped for this (for example, in a landfill area) or in open boilers. In this case, a huge amount of toxic substances and heavy metals will be released into the air, and even a small exposure to them can cause serious health problems. The use of an incinerator solves this problem. Incineration is a controlled process. As well as this, the well-thought-out design of the furnaces allows waste to be burned without harmful effects on humans and the environment;

2. **Demercurization.** To dispose of class G waste, a demercurization method is utilized as well. Mercury-containing elements are heated to 450–550 °C in a vacuum or at atmospheric pressure. The vapors that are released are captured by special devices and condensed;

3. **Pyrolysis.** This method is an alternative thermal treatment method in which waste is placed in an oxygen-free environment where it decomposes under high temperatures. As a result, a concentrated vapor-gas mixture is formed, which is sent to the afterburner. The output remains a dry and safe solid residue, ash for example, as well as carbon monoxide and water, which are also absolutely harmless. Pyrolysis can be applied to class B waste. This class includes materials and instruments contaminated with biological fluids, organic waste, and waste from microbiological laboratories;

4. **Plasma system.** The essence of this method is to heat waste with an electric arc with a temperature of about 6000 °C. In this case, all potentially dangerous microbes will be destroyed. The waste will turn into slag and non-flammable gases;

5. **Thermochemical recuperators.** Installations with thermochemical utilizers combine waste shredding with special knives, subsequent heating and treatment with disinfectants. This method is suitable for neutralizing waste of classes B and C. The

disadvantage of such installations is that toxic and explosive gases are released, which means that the installations must be equipped with powerful filters and ventilation devices. Other than that, some users note that the installation is noisy and replacement knives have to be changed frequently, and they are not cheap;

6. Steam sterilizers. Charles Chamberland invented the first autoclave back in 1876, and since then steam sterilizers have been widely used not only in medical institutions, but also in industrial production. It is logical that the idea arose of using steam to destroy hazardous medical waste. The process takes place in two stages: first, the waste is placed in an installation with a shredder-type grinder. At the second stage, the waste is sterilized using saturated water steam. The final product is a sterile mass that can be disposed of as class A waste. This does not generate harmful emissions that pollute the atmosphere, that is, the technology is environmentally friendly [5].

A number of general scientific methods were used in conducting the research. The monographic method was used to research and identify trends in disposing and recycling medical waste. Within the framework of this method, the works of foreign and domestic researchers were studied and the Order of the Minister of Health of the Republic of Kazakhstan dated April 23, 2018 No. 187 was analyzed. Comparison analysis method was used to compare the basic notions related to medical waste and methods of disposing and recycling medical wastes.

The materials of the research include documentations like the requirements of the Sanitary Rules “Sanitary and Epidemiological Requirements for Healthcare Facilities”, approved by Order of the Minister of Health of the Republic of Kazakhstan No. KR DSM -96/2020 dated 08/11/2020, the data from official channels like Kazinform as well as Khabar 24, and scientific works written by Katrukha S.K. , Falova O.E., Akimkin V.G and Khrapunova I.A.

In general, in Kazakhstan, the area of medical waste disposal is being studied and solutions to problems associated with it are being offered. However, there is a lack of the data related to recycling medical waste. For instance, scientists at Al-Farabi Kazakh National University proposed and developed an innovative method for recycling biomedical waste. The uniqueness of plasma recycling technology is that it enables complete thermal neutralization of biomedical waste. As a result, processing efficiency increases and energy costs for the process are reduced. The plasma disposal method is gaining popularity due to the possibility of processing waste of various classes, even radioactive ones if necessary. This method is also one of the most environmentally friendly, which is due to the high temperature in the affected area. Compared with the traditional method, plasma recycling can process biomedical waste without sorting it [6].

Currently, a number of enterprises purchase containers for medical waste in Russia and China. In September 2022, the Khabar 24 TV channel reported that LLP “Eco-Post-2020”, under the leadership of Adlet Esbergenov, intended to launch work on the production of special containers for the disposal of medical waste in the Akmola region. It was expected that the workshop's capacity would reach 50 million pieces per year. Thus, the entire demand of the domestic market would be covered.

This large and noisy structure would produce cardboard boxes - special containers for transporting and processing medical waste. The workshop for their production was recently built, and commissioning work is now underway. The container was expected to be made of three-layer cardboard. The color and marking matched the hazard class. The box would be tightly closed, which was safe and convenient for transportation. The container did not lose its properties throughout its entire service life. The authors of the project assembled this equipment themselves. Thus, in December 2023 it became known that the production of finished paper packaging from corrugated cardboard had been launched in the Karaotkel rural district by that LLP "Eco-Post-2020". The product range includes both standard boxes and complex die-cut packaging. Due to such advantages as environmental friendliness, this type of container is widely used in the food and pharmaceutical industries. Another advantage of the enterprise is the presence of a full technological cycle, which allows timely control of the quality of manufactured products [7].

The «Ecoprom» company in Almaty has special equipment and modern technologies for the professional disposal of medical waste in Almaty. Disposal of medical waste in Almaty by «Ecoprom» is carried out in full compliance with the requirements of sanitary rules and regulations of the Republic of Kazakhstan: in a closed chamber, using the thermal disinfection method. This technology eliminates polluting emissions into the environment and does not require preliminary disinfection of waste. This company disposes of medical waste of classes A, B and C [8].

Despite the enormous efforts of both scientists and companies specifying in dealing with medical wastes, the rules of disposing medical wastes are being violated in Kazakhstan.

Kazinform with reference to the press service of the Ministry of Energy reported that The Department of Ecology for the Pavlodar region in December 2018 identified illegal activities related to the illegal handling of hazardous medical waste, which poses a high environmental and sanitary-epidemiological danger to the residents of Pavlodar. Reportedly, a trip was made to the Central Industrial Zone of Pavlodar, where the production base of LLP "Utilization" is located. It was established that, contrary to environmental and sanitary requirements, medical waste of class "B" and "C" in a volume of 27.8 cubic meters is placed in the open air on a land plot in plastic bags, which is burned in a makeshift stove, also located on this site. For violation of environmental requirements, LLP "Utilization" was charged to administrative liability under Articles 328 and 322 of the Code of the Republic of Kazakhstan "On Administrative Offences" for a total amount of 144,300 tenge. Due to illegal actions, damage to the environment was caused in the amount of 1,712,529 tenge, the violator was issued orders for compensation. An appeal was sent to Mayor of Pavlodar to take measures to dispose of illegally disposed medical waste in accordance with sanitary and epidemiological requirements [9]. This law still needs reconsideration and enforcement, since the violation of medical waste rules are harmful to human.

According to the investigation conducted by Khabar 24 channel, the medical organizations are responsible for the content of containers for disposing medical

waste, and they are not checked by those companies disposing the waste. They rely on the documentations provided by medical organizations, meanwhile medical organizations are not in charge of the medical waste, once the waste is passed to waste disposing companies. In addition to that, companies disposing the waste employ workers after 1 month course of preparation and supply them with the document of completing the course. The checking process should be arranged in a more stringent way, as the process of working with medical waste is likely to harm those who work in these companies, likewise the medical workers might mix the waste up.

As is seen from the data given above, apparently, the medical waste is not being sorted, disposed, and recycled properly. We propose that it requires law enforcement to compel responsible people to follow rules and special companies for recycling non-hazardous medical waste. We are convinced that not only the government is responsible for solving this issue, scientists are capable of solving it as well. They may launch projects to recycle medical waste and construct companies for that and the government may invest in it. This combination will operate positively. As regards the law enforcement, the government is able to make responsible people to complete their job commitments properly by enforcing the punishment for violation the rules for disposing the medical waste. In addition to that, we offer steam sterilizers method as a proper way to solve the issue. We assume that in case some hazardous wastes are prone to be sterilized, they might be recycled. Once they are recycled, they turn into medical waste of class A and will be recycled. It will facilitate to lessen the amount of harm it brings to the environment and human. Hence, this method is to be implemented in Kazakhstani system.

To draw a conclusion, the growth of medical waste is very relevant for our country today. The measures taken by the Ministries of Health, Ecology, Geology and Natural Resources are insufficient. This is due to the number of people who dump medical waste into the desert remain the same. It is a significant problem in the country and it can be solved by the government, scientists, and medical workers. Disposal of medical waste requires great care and responsibility. This is because if the disposal of hazardous waste is not carried out properly, there is a great risk of secondary transmission of the disease as a result of the spread of infection among waste collectors, medical workers, patients and the general public.

The article proposes the methods of disposing hazardous medical waste that are effective in terms of dealing with them. Additionally, the article represents the method appropriate to turn hazardous medical waste into non-hazardous one and offers its implementation in Kazakhstan.

Regardless of the assumption that medical waste is hazardous, most of them are non-hazardous, moreover, some of them are likely to be sterilized and convert into the medical waste of a class A. So, they need to be recycled, this issue is not properly solved in our country. We believe that there is a strong likelihood that this will be addressed by implementing the steam sterilizers method which helps to sterilize some of hazardous waste and constructing non-hazardous waste recycling companies.

In addition, the violation of rules of disposing medical waste is an alarming problem. This issue is likely to be tackled by the government enforcing the law by punishing the violators stringently. Those working with medical waste should be punished for violating the rules with a huge amount of money. Other than that, they are obliged to undergo courses to work with medical waste.

### Reference

1. Катруха, С.К., Фалова, О.Е. Плазменный метод утилизации медицинских отходов. // Современные наукоемкие технологии. – 2014. – № 5-1. – С. 42-43;
2. Акимкин, В.Г. Современные особенности динамики объемов образования медицинских отходов в крупных городах Российской Федерации. // Эпидемиология и инфекционные болезни. – 2014. – №5. – С. 4-10.
3. Требования Санитарных правил «Санитарно-эпидемиологические требования к объектам здравоохранения», утвержденных приказом Министра здравоохранения Республики Казахстан № КР ДСМ -96/2020 от 11.08.2020 года. [Электронный ресурс]. – URL: <https://adilet.zan.kz/rus/docs/V2100023890>
4. Health-care waste. World Health Organization. [Электронный ресурс]. – URL: <https://www.who.int/news-room/fact-sheets/detail/health-care-waste>.
- Храпунова, И.А. Эпидемиологическая опасность медицинских отходов. // СанЭпидемКонтроль. – 2014. – № 1. – С. 45–48.
5. Уникальный метод утилизации медицинских отходов разработали Казахстанские ученые. [Электронный ресурс]. – URL: <https://www.kaznu.kz/ru/3/news/one/27055/>.
6. Безопасная утилизация медотходов в Акмолинской области запустят в предприятие. [Электронный ресурс]. – URL: <https://24.kz/ru/news/social/item/565056-bezopasnaya-utilizatsiya-medotkhodov-v-akmolinskoj-oblasti-zapustyat-predpriyatie>.
7. Вывоз и утилизация медицинских отходов в Алматы. [Электронный ресурс]. – URL: <https://ecoprom.kz/services.htm>.
- 8.3. Жакупова. В Казахстане нарушают нормы утилизации медотходов. Кто делает на этом деньги, а кого наказывают? [Электронный ресурс]. – URL: <https://informburo.kz/stati/v-kazahstane-narushayut-normy-utilizacii-medotkhodov-kto-delaet-na-etom-dengi-a-kogo-nakazyvayut.html>.
9. Как утилизируют медицинские отходы в Казахстане? [Электронный ресурс]. – URL: <https://www.youtube.com/watch?v=YG1ngBF6edw&t=33s>.