Report on the work of the Dissertation Council in the direction of Engineering and Engineering affairs (GEP D097- «Chemical Engineering and Processes» EP «8D07109 - Innovative Technologies and New Inorganic Materials»; GEP D108 – «Nanomaterials and Nanotechnologies» EP «8D07114 - Nanomaterials and Nanotechnologies») of the NJSC «Kazakh National Research Technical University named after K.I. Satbayev»

1. Data on the number of meetings held – 3 meeting.

2. Surnames, first names, patronymics (if any) of the members of the dissertation council who attended less than half of the meetings: none.

3. List of doctoral students with indication of the organization of training:

- Kunarbekova M.S. – NJSC «Kazakh National Research Technical University named after K.I. Satbayev»;

4. Brief analysis of dissertations considered by the Council during the reporting year

№	Full name of the doctoral student	Dissertation topic	Code and title of specialty
1	Kunarbekova Makhabbat Seit-Zadayevna	Preparation of modified carbon materials for the removal of radionuclides from contaminated water	Educational program «8D07109 - Innovative technologies and new inorganic materials»

4.1. The analysis of the subject of work of Kunarbekova Makhabbat Seit-Zadayevna " Preparation of modified carbon materials for the removal of radionuclides from contaminated water", submitted for the degree of Doctor of Philosophy (PhD) in the Educational program "8D07109 - Innovative technologies and new inorganic materials". Contamination of water with radionuclides, especially radioactive cesium and iodine, is a serious problem for the environment and public health. These radionuclides, which are often released during nuclear accidents or industrial activities, pose a long-term danger due to their high solubility, mobility and persistence in the environment. Therefore, the development of effective methods for the removal of these hazardous substances is crucial to ensure the purity of water and the protection of ecosystems, as well as to support the industries that emit them. Carbon-based materials have a large surface area, are chemically stable, and have adjustable properties, among other advantages for water purification. The author of the work proposed to study their application for the capture of the above-mentioned radionuclides. By modifying these materials, it is possible to increase their adsorption properties, which will make them effective in capturing radioactive caesium and iodine from contaminated water. This research is aimed at obtaining and optimizing modified carbon materials as advanced adsorbents for the removal of radionuclides.

The scientific results and provisions of this dissertation are new. When performing the dissertation work:

- Sorbents based on activated carbon from various biomass sources have been developed and optimized using physical and chemical activation, including a new method of hydrothermal impregnation with urea (N-source) and Prussian blue (Cs-selective agent).
- Urea-modified sorbents demonstrated improved sorption characteristics due to targeted nitrogen doping (~1%), especially effective in meso-/macroporous matrices, which significantly improves the absorption of triiodide (I_3^-) ions.
- The high selectivity of Prussian blue-modified sorbents for Cs^+ ions in the presence of competing ions (Sr^{2+}, Ca^{2+}, Na^+), reducing total radioactivity below regulatory limits, has been confirmed.

- The characteristics of the sorbent were tested on real samples of radioactive water from the Semipalatinsk Nuclear Test Site (Degelen) and molecular modeling (Gaussian) was applied to identify the mechanisms of interaction at the atomic level.

The connection of the dissertation topic with the directions of scientific development, which are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of Article 18 of the Law "On Science" and (or) state programs. The topic of the dissertation corresponds to the scientific direction "Rational use of natural resources, including water resources, geology, processing, new materials and technologies, safe products and designs".

The dissertation work was carried out in accordance with the research plan of the Department of Chemical Processes and Industrial Ecology of the Kazakh National Research Technical University named after K.I. Satpayev on the state budget BR21881939 "Development of resource-saving energy production technologies for the mining and metallurgical complex and the creation of an innovative engineering center" (executor) and AP19577049 "Synthesis, characterization and physical-chemical study of sorbents from biomass for industrial water purification from radionuclides" (responsible executor) for 2023-2025 yy.

Analysis of the level of implementation of dissertation results into practical activities.

Based on the results of dissertation research, 8 papers have been published, including 1 review article in the journal Q1 on the Web of Science database, 2 articles in publications recommended by the Committee for Quality Assurance in Science and Higher Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan, 5 articles published in the materials of international conferences.

According to the research results, 1 patent for a utility model of the Republic of Kazakhstan was obtained (Utility Model Patent dated 08/16/2024).

The research results were tested at international scientific and practical conferences: the 2nd International Conference on High Energy Physics, Materials Science and Nanotechnology (ICHEPMS-2024), dedicated to the memory of Ernst Herbert Boos, Academician of the National Academy of Sciences of the Republic of Kazakhstan (February 15-16, 2024). "Carbons obtained from biomass for the sorption of radionuclides" M. Kunarbekova, Azat S. ISBN 978-601-08-3798-0; X International Conference "Semipalatinsk Research Forum: Research and prospects for the development of scientific and technological progress" (STS-2023), September 12-14, 2023, Kurchatov, Republic of Kazakhstan. "Sorption of radioactive iodine with activated carbon" by M.S. Kunarbekova, K.K. Kudaibergenov, S. Azat, Institute of Combat Problems – 2024; VIII Kazakhstan Student Scientific and Practical Conference "Chemical Physics and Nanomaterials", dedicated to the 110th anniversary of the birth of the Three-time Hero of Socialist Labor, Academician Ya.B. Zeldovich, Almaty: Publishing HouseDaryn", 2024. -141 p. Kunarbekova M.S., Sapargali I.O., Seymukhanova L.N., Kudaibergenov K.K., Azat S. ISBN 978-5-7782-43 "Synthesis of nanocomposite sorbent modified with nitrogen-containing groups from activated buckwheat husk"; 4th International Russian-Kazakh Scientific and Practical Conference "Chemical technologies of functional materials" dedicated to the 90th anniversary of the formation of the Kazakh National Al-Farabi University, Almaty, Kazakhstan, April 25-26, 2024. "Synthesis of a nanocomposite sorbent modified with nitrogen groups from the biomass of walnut husks and buckwheat by chemical activation", Kunarbekova M.S., Sapargali I.O., Seymukhanova L.N., Kudaibergenov K.K., Zhantikeev U.E., Azat S. ISBN 978-601-04-6697-5; Symposium on Advanced Engineering Sciences and the 2nd International Symposium on New Materials and devices, June 23-29, 2024. "Synthesis and characterization of modified activated carbon for the sorption of radionuclides" Kunarbekova M.S., Sapargali I.O., Seimukhanova L.N., Kudaibergenov K.K., Zhantikeev U.E., Azat S.

The results of Kunarbekova Mahabbat Seit-Zadaevna's dissertation on "Preparation of modified carbon materials for the removal of radionuclides from contaminated water", which have high theoretical and practical significance, can be implemented both in the production of new domestic sorption materials and in the educational process to improve the quality of training specialists in the field of inorganic substances technology and industrial ecology.

5. Analysis of the work of official reviewers

№	Full name doctoral student	Reviewers	
		Full name of the 1st reviewer (position, academic degree, title, number of publications in the specialty over the past 5 years)	**Full name of the 2nd reviewer (position, academic degree, rank, number of publications in the specialty over the past 5 years)**
1	**Kunarbekova Makhabbat Seit-Zadayevna**	Appazov Nurbol – Candidate of Chemical Sciences, Research Professor, Department of Engineering Technologies, Korkyt Ata University (Kyzylorda, Republic of Kazakhstan), h-index – 9; has more than 5 scientific publications on the educational program 8D07109 – "Innovative Technologies and New Inorganic Materials"	Issayeva Assem - PhD, Senior Researcher, Scientific and Production Enterprise Antigen LLP (Almaty region, Karasai district, Abai village, Republic of Kazakhstan), h-index – 4. has more than 5 scientific publications on the educational program 8D07109 - "Innovative technologies and new inorganic materials"

All reviewers have experience in research work, there are published works in the direction of dissertation work and meet the requirements.

6. Data on the considered dissertations for the degree of Doctor of Philosophy (PhD), Doctor of Science

Dissertation Council in the direction of Engineering and Engineering affairs (GEP D097- «Chemical Engineering and Processes» EP «8D07109 - Innovative Technologies and New Inorganic Materials»; GEP D108 – «Nanomaterials and Nanotechnologies» EP «8D07114 - Nanomaterials and Nanotechnologies»)	**Code and title specialty/educational program**
	GEP D097- «Chemical Engineering and Processes» EP «8D07109 - Innovative Technologies and New Inorganic Materials»
Theses accepted for defense	1
Including doctoral students from other universities	-
Dissertations withdrawn from consideration	-
Including doctoral students from other universities	-
Dissertations that received negative reviews from reviewers	-
Including doctoral students from other universities	-
Dissertations with a negative decision following the defense	-
Including doctoral students from other universities	-
Dissertations submitted for revision	-

Including doctoral students from other universities	-
Dissertations submitted for re-defense	-
Including doctoral students from other universities	-

Chairman of the Dissertation Council in the direction of Engineering and Engineering affairs (GEP D097- «Chemical Engineering and Processes» EP «8D07109 - Innovative Technologies and New Inorganic Materials»; GEP D108 – «Nanomaterials and Nanotechnologies» EP «8D07114 - Nanomaterials and Nanotechnologies») of the NJSC «Kazakh National Research Technical University», Candidate of Technical Sciences, Associate Professor **S.K. Kabdrakhmanova**

Scientific Secretary of the Dissertation Council, Candidate of Technical Sciences, Associate Professor **Sh.N. Kubekova**