REPORT
on the work of the Dissertation Council

The Dissertation Council at Abai Kazakh National Pedagogical University for the following fields: 8D015 - Preparation of teachers in natural sciences (6D011200/8D01510 - Chemistry) and 8D053 - Physical and Chemical Sciences (6D060600/8D05301 - Chemistry)

1. Information about the number of meetings held

In 2024, 3 meetings of the Dissertation Council were held to defend dissertations for the degree of Doctor of Philosophy (PhD) in the fields of 8D015 – Preparation of teachers in natural sciences (6D011200/8D01510 - Chemistry) and 8D053 – Physical and Chemical Sciences (6D060600/8D05301 - Chemistry) (from 31.01.2024 to 30.12.2024).

Names of council members who participated in less than half of the meetings (if any)

There were no members of the Dissertation Council who participated in less than half of the meetings.

List of doctoral students from the specified educational institutions.

1. *Utemissova Arailym Zhubatkanovna*, Abai Kazakh National Pedagogical University;
2. *Kambarova Elmira Abduvalievna*, M.Kh.Dulaty Taraz Regional University;
3. *Khimersen Khuangul*, Abai Kazakh National Pedagogical University.

4. A brief analysis of the dissertation works by sections that were reviewed during the reporting year:

1. On the dissertation of Utemissova Arailym Zhubatkanovna:

1) Analysis of the topics reviewed in the works

The dissertation topic – The theory and methodology of humanization of the educational process in higher educational institutions (using the example of teaching chemistry).

Specialty: 6D011200 – Chemistry

Supervisors – Doctor of Pedagogical Sciences, Professor Zhenis Akhimzhanovich Shokybayev, Professor of the Herzen State Pedagogical University of Russia, Gavronskaya Yulia Yurievna.

The dissertation was carried out at Abai Kazakh National Pedagogical University.

The defense took place on April 5, 2024.

The following new and reliable results were obtained in the work:

- A deep analysis of the works of scholars studying the theory and methodology of humanizing the educational process in higher educational institutions, as well as the systematization of theoretical foundations on the studied topic;

- Creation of a structural content model of the theory and methodology of humanizing chemistry teaching in the preparation of future chemistry teachers;

- Development of a methodological system for the humanization of chemistry teaching in higher educational institutions;

- Conducting an experimental pedagogical study on the methodology of humanizing chemistry teaching in universities with an analysis of the obtained results.

2) Correspondence of the research topic to the directions of scientific development formed under the control of the Higher Scientific and Technical Commission of the Government of the Republic of Kazakhstan and the dissertation topic in accordance with Part 3 of Article 18 of the Law "On Science" and (or) state programs

The topic of the doctoral research work is based on the tasks outlined in the Republic of Kazakhstan Law "On Education", the Republic of Kazakhstan Law "On the Status of Teachers", as well as in the National Development Plan of Kazakhstan until 2025. The latter does not specifically outline humanistic directions in education but emphasizes that "such traditional universal values as honesty, kindness, justice, and self-improvement should prevail among the youth of Kazakhstan".

3) Analysis of the level of implementation of the dissertation results in practical activities

- Based on the methodological and theoretical foundations, a teaching manual for instructors entitled "Ways to Form Professional Orientation of Future Pedagogical Chemists" was developed according to the concept of humanizing chemistry teaching;

- A system of special exercises and tasks aimed at humanizing the process of chemistry teaching was developed;

- A test system was created to assess student's knowledge;

- A teaching manual for future educators on the humanization of chemistry teaching was developed.

2. On the dissertation of Kambarova Elmira Abduvalievna:

1) Analysis of the topics reviewed in the works

The dissertation topic – Adsorption of heavy metals on the surface of shungite and zeolite modified with epoxy resin.

Specialty: 6D060600 – Chemistry

Supervisors – Doctor of Chemical Sciences, Professor Nesiphan Abzjaparovich Bektenov, Professor of the National Research Tomsk Polytechnic University Mikhail Alekseyevich Gavrilenko.

The dissertation was carried out at M.Kh.Dulaty Taraz Regional University.

The defense took place on June 14, 2024.

The following new and reliable results were obtained in the work:

- *A new method for modifying natural zeolites and shungites with epoxy resin ED-20 was developed, which includes the use of polyethylene polyamine as an intermediate layer between the surface of the natural sorbent and the epoxy resin, as well as an initiator for polymerization, allowing control over the degree of oligomerization of the resin. The optimal ratios of polyethylene polyamine and epoxy resin were experimentally determined, and a new method for layer-by-layer application and fixation of modifiers on the surface was proposed;*
- *For the first time, a comprehensive study of the thermodynamic characteristics of the adsorption of heavy metal cations on zeolites and shungites was conducted, where the surface was modified with an ion-exchange polyelectrolyte. An adsorption scheme for heavy metals was proposed, and it was proven that the adsorption isotherms of heavy metal cations correspond to L and S types and follow the Langmuir equation;*
- *For the first time, the effectiveness of using the developed adsorption materials for dynamic and static water purification from heavy metal cations was proven.*

2) Correspondence of the dissertation topic to the directions of scientific development formed under the control of the Higher Scientific and Technical Commission of the Government of the Republic of Kazakhstan in accordance with Part 3 of Article 18 of the Law "On Science" and (or) state programs

The topic of the doctoral research work corresponds to the priority direction of scientific development approved by the Higher Scientific and Technical Commission of the Government of the Republic of Kazakhstan: "Rational use of natural resources, including water resources, geology, recycling, new materials and technologies, safe products and constructions."

3) Analysis of the level of implementation of the dissertation results in practical activities

The practical significance of the work lies in the development of new sorbents for water purification from heavy metal cations. The testing protocol for two developed sorbents was included in the federal registration protocols of the Russian Federation

3. On the dissertation of Khimersen Khuangul:

1) Analysis of the topics reviewed in the works

The dissertation topic – Creation of high-quality modern sorbents for the extraction of scandium from technological solutions.

Specialty: 8D05301 – Chemistry

Supervisors – Doctor of Chemical Sciences, Professor, Head of the Polymer Synthesis and Physico-Chemical Laboratory of the Institute of Chemical Sciences named after A.B. Bekturov, JSC, Dzhumadilov Talkybek Kozhataevich; Professor of Gdansk University of Technology, Józef Tadeusz Haponiuk.

The dissertation was carried out at the Abai Kazakh National Pedagogical University.

The defense took place on November 19, 2024.

The following new and reliable results were obtained in the work:

1. *For the first time, interpolymer systems based on industrial ion-exchangers Lewatit CNP LF, AB-17-8 were created, and the electrochemical properties of the obtained IP systems were studied;*
2. *For the first time, the influence of the initial states of polymers on the mutual activation process of IP systems Lewatit CNP LF:AB-17-8 was studied, and conditions under which the sorption process occurs at a high level were predicted;*
3. *New data were obtained on the sorptive extraction of scandium ions from aqueous solutions using functional polymers with different molar ratios;*
4. *The results of studying the sorption of IP systems Lewatit CNP LF:AB-17-8 and Amberlite IR120:AB-17-8 showed that changing the molar ratios of these IP systems allows for the separation of scandium from lutetium ions.*

2) Correspondence of the dissertation topic to the directions of scientific development formed under the control of the Higher Scientific and Technical Commission of the Government of the Republic of Kazakhstan in accordance with Part 3 of Article 18 of the Law "On Science" and (or) state programs

The dissertation was carried out within the framework of the state grant program "Development of modern methods for the separation and extraction of rare-earth metals from sulfuric acid dehydration concentrates and technological solutions" (AP14870002, 2022-2024). The dissertation work corresponds to the priority direction of scientific development approved by the Higher Scientific and Technical Commission of the Government of the Republic of Kazakhstan in the field of "Scientific research in natural sciences".

3) Analysis of the level of implementation of the dissertation results in practical activities

As a result of the research, 1 utility model patent was obtained in the Republic of Kazakhstan: A method for extracting scandium from production solutions. Utility model patent No. 6583, issued on October 29, 2021.

5. Analysis of the work of official reviewers (with examples of the least quality reviews).

Five scholars whose articles and research directions align with the topic of the doctoral thesis were appointed as reviewers for the doctoral research work. The reviewers analyzed the dissertation according to the requirements and presented their decisions.

For the dissertation of Utemissova Arailym Zhubatkanovna:

1. **Dautova Zukhra** - Candidate of pedagogical sciences, associate professor, S.Amanzholov East Kazakhstan State University (Ust-Kamenogorsk, Kazakhstan);
2. **Niyazbaeva Almagul** - Candidate of Chemical Sciences, associate Professor, Al-Farabi Kazakh National University (Almaty, Kazakhstan).

For the dissertation of Kambarova Elmira Abduvalievna:

1. **Urkimbayeva Perizat** - Candidate of Chemical Sciences, Associate Professor, Al-Farabi Kazakh National University (Almaty, Kazakhstan);
2. **Tazhbayev Yerkeblan** - Doctor of Chemical Sciences, Professor, Karagandy University named after E. A. Buketov (Karaganda, Kazakhstan).

For the dissertation of Khimersen Khuangul:

1. **Taussarova Bijamal Raimovna** - Doctor of Chemical Sciences, Professor, Almaty Technological University (Almaty, Kazakhstan);
2. **Nurxat Nuraje** - PhD, Professor, Nazarbayev University (Astana, Kazakhstan).

6. Suggestions for further improving the system of scientific personnel training

In accordance with the doctoral roadmap approved on October 21, 2024, at the Abai Kazakh National Pedagogical University, we consider it necessary for the graduating department to develop criteria for assessing the quality of the doctoral research work at various stages of the doctoral study.

7. The number of dissertations developed for the award of the degree of Doctor of Philosophy (PhD) in the field:

	8D015 - Training of educators in natural sciences (6D011200/ 8D01510 - Chemistry) and 8D053 - Physical and chemical sciences (6D060600/8D05301 - Chemistry)
1) Dissertations accepted for defense (including those from doctoral candidates of other universities)	3 (including 1 from doctoral candidates of other universities)
2) Dissertations excluded from review (including those from doctoral candidates of other universities)	-
3) Dissertations with negative reviews from reviewers (including those from doctoral candidates of other universities)	-
4) Dissertations with negative decisions following the defense results (including those from doctoral candidates of other universities)	-
5) Dissertations sent for revision (including those from doctoral candidates of other universities)	-
6) Dissertations sent for re-defense (including those from doctoral candidates of other universities)	-

Chairman of the Dissertation Council _____ N. A. Bektenov

Academic Secretary of the Dissertation Council _____ L. N. Demeuova

"31" December 2024