

*Federal State Autonomous Educational Institution of Higher Education
«Peoples' Friendship university of Russia»*

Faculty of Science

Adopted by Academic Council
Of the Faculty of Science

protocol № 0201-08/06
15.12.2020

Affirm
First Vice Rector –
Vice Rector for Education

A.V. Dolzhikova
20__ г.



Basic professional studying program of higher education

Direction of training (specialty)

04.06.01 CHEMICAL SCIENCES

Approved by the order of the Ministry of Education and Science of Russia Federation 12.09.2013
№ 1061

The programme was designed appropriate to requirements of ES HE RUDN that was affirmed by
rector's decree dated 26.02.2015 № 96

Graduate' s qualification: Researcher. Mentor-researcher

The direction of programme (profile, specialty):

Organic chemistry: Chemistry of heterocyclic compounds

Form of studying - full-time

A period of programme mastering - 4 years

Information about features of the implementation of the basic studying programme:
Implemented in English

Agreed:
Director of the programme
L.G. Voskressensky

Agreed:
Director of MSSN
L.G. Voskressensky

Agreed:
Director of the Institute
L.G. Voskressensky

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*Федеральное государственное автономное образовательное учреждение высшего образования
Российский университет дружбы народов*

Факультет физико-математических и естественных наук

Принято Ученым советом факультета
физико-математических и
естественных наук

Протокол № 0201-08/06
«15» декабря 2020 г.



Утверждаю
Первый проректор - проректор по
образовательной деятельности

А. В. Должикова
20__ г.

**Основная профессиональная образовательная программа
высшего образования**

Направление подготовки

04.06.01 ХИМИЧЕСКИЕ НАУКИ

в соответствии с перечнем, утвержденным приказом Минобрнауки России от 12.09.2013г. № 1061.

Программа разработана в соответствии с требованиями ОС ВО РУДН, утвержденным приказом ректора от 26.02.2015 г. № 96

Квалификация выпускника: Исследователь. Преподаватель-исследователь

Направленность программы (профиль, специализация):

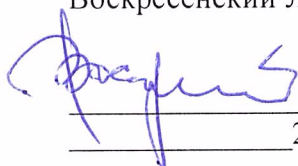
Органическая химия: химия гетероциклических соединений

Форма обучения – очная

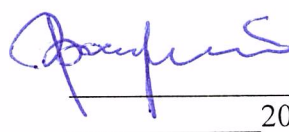
Срок освоения программы в очной форме – 4 года

Сведения об особенностях реализации основной образовательной программы:
реализуется на английском языке

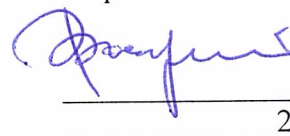
Согласовано:
Руководитель программы
Воскресенский Л.Г.


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Согласовано:
Председатель МССН
Воскресенский Л.Г.


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Согласовано:
Руководитель ОУП
Воскресенский Л.Г.


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2021 г.

Educational program description

General characteristics of the EP HE

1.1. *The purpose (mission) EP HE*

The **EP HE mission** is to provide high quality training of scientific and scientific-pedagogical personnel in the specialization 04.06.01 "Chemistry", with social mobility, competitiveness and sustainability in modern labor market.

The **aim** of PhD Programme- training of scientific and scientific-pedagogical personnel, capable of making innovations in the field of science, education, culture and management.

The **objectives** of the **EP HE** is:

- Formation of competences of independent research and educational activities;
- In-depth study of theoretical and methodological foundations of Chemistry;
- Improvement of philosophical science training focused on professional activities;
- Improving the knowledge of a foreign language to be used in scientific and professional activities;
- Formation of the competences necessary for successful research and teaching work in this branch of science.

1.2. **General information.**

The basic educational program of 04.06.01 "Chemical sciences" specialization "Physical chemistry of adsorption and catalysis".

Training program of 04.06.01 "Chemical sciences" is carried out at the "RUDN University" in full-time education with qualification "Researcher. Lecturer-Researcher"

Volume of PhD Programme is 240 credit units using the network form, the implementation of training on an individual curriculum, including accelerated learning.

Standard term of development of basic PhD educational programme of 04.06.01 Chemical sciences", specialization "Physical chemistry of adsorption and catalysis" for full-time education is 4 years. For the disabled the term of education on individual curricula disabilities may be increased by not more than a year.

1.3. *Features of implementation of EP HE*

In implementing of PhD programme of 04.06.01 "Chemical sciences", specialization "Physical chemistry of adsorption and catalysis" is planned to use e-learning and distance learning technologies. When teaching people with disabilities and persons with disabilities e-learning and distance education technology provides an opportunity of information exchange in any available to them forms. Implementation of graduate programs in this field of study is possible in the network form.

Educational activities of PhD programme is carried out in English (in accordance with local act of RUDN University).

1.4. Labor market demand for graduates of this Educational Programme

The objects of PhD programme of 04.06.01 "Chemical sciences", specialization "Physical chemistry of adsorption and catalysis" are research and production companies of chemical and related profile, higher education institutions, services, economic and other institutions that need specialists with higher chemical qualifications.

Researcher, Lecturer and researcher of chemistry can work in positions of highly qualified specialists in view of the training profile and work experience.

1.5. Eligibility Requirements.

Applicant must have a document of the state standard of higher professional education (master's or professional degree) in one of the areas of natural science or a natural-science specialties.

1.6. Characteristics of professional activity of graduates EP:

1.6.1 The area of professional activity.

The area of professional activity of graduates completed the postgraduate program:

- Solving complex problems in the research, organizational, managerial and educational activities associated with the use of chemical processes;
- Participation in studies of chemical processes that occur in nature and conducted in a laboratory, the identification of the general laws of their occurrence and their management capabilities;
- Theoretical and experimental research, mathematical and computer modeling of chemical processes, covering a set of problems of fundamental and applied chemistry (according to educational programme), as well as related natural science disciplines.

1.6.2 Objects of the professional activities

The objects of professional activity of graduates completed the postgraduate program is a chemical element, simple molecules and complex compounds in different aggregate states (inorganic and organic substances and materials based on them) obtained from chemical synthesis (laboratory, industrial) or derived from natural objects, new substances, chemical processes and general laws of their occurrence, the interdisciplinary scientific problems.

1.6.3 Types of the professional activities:

Types of the professional activities which prepare graduates completed the postgraduate programme:

- research and development;
- scientific and pedagogical.

1.6.4 Objectives of professional activity.

A graduates completed the PhD programme of 04.06.01 "Chemical sciences", specialization "Physical chemistry of adsorption and catalysis" with following professional tasks:

Research and development activities:

- development of research programs and technological developments in chemistry, preparation tasks for research and scientific work;
- collection, processing, analysis and systematization of scientific and technical information relating to the research, selection and justification of methods and means of solving the problems;

- the development of methods and organization of experiments and tests, the analysis of their results;
- training of scientific and technical reports, surveys and publications on the results of the research;
- participation in conferences, workshops, schools, seminars, etc .;
- protection of intellectual property, control of the results of research activities;

Scientific and pedagogical activities:

- preparation of education materials and conducting theoretical and laboratory classes at the University;
- implementation and development of new educational technologies, including distance learning and computer systems.

1.7. Requirements to the results of mastering the PhD Programme

As a result of the completing of PhD programme studies should be formed universal competence, general professional competence, determines the direction of training, professional competence, defined with course of «Chemical Sciences» PhD Programme.

Graduate completed the PhD program, must have the following Universal Competences:

- Ability of critical analysis and evaluation of modern scientific achievements; generating new ideas on course of research and practical tasks including interdisciplinary fields UC-1
- Ability to make projects and realize complex researches including interdisciplinary ones, on the bases of holistic systemic scientific worldview and using the achievements of history and philosophy of science UC-2
- Readiness to take part in Russian and international research teams to attain scientific and educational tasks UC-3
- Readiness to use modern methods and techniques of scientific communication on state and foreign languages UC-4
- Ability to plan and solve task of professional and personal self-development UC-5

Graduate completed the PhD program, must have the following General Professional Competences:

- Ability to fulfill independently scientific research activity corresponding to the professional field using modern methods and IT technology (GPC-1)
- Readiness to organize teamwork of a research group in the fields of chemistry and related sciences (GPC-2)
- Readiness to teach students according to main higher educational programmes (GPC-3)

Graduate completed the PhD program, must have the following Professional Competences:

- Competence in methodology of both theoretical and experimental research in the field of chemistry, competence in culture of chemical research (PC-1);
- Ability to conduct self-sustained research and obtain scientific results that meet the established requirements for the content of dissertations for the phd degree in the selected profile (scientific specialty) (PC-2);
- Experience in professional discussions, compiling scientific results into a report, preparing publications in peer-reviewed Russian and international journals (PC-3);
- Ability to apply fundamental scientific knowledge in the field of chemistry and related sciences in the implementation of teaching activities; knowledge of teaching methods and the development of teaching materials of disciplines in the field of chemistry (PC-4).

1.8 The competency templates

Type of professional activity: research activity in the field of chemistry and related sciences; teaching in the field of chemistry and related.

	Subjects (modules) according to the curriculum	Universal Competences				
		UC-1 Ability of critical analysis and evaluation of modern scientific achievements; generating new ideas on course of research and practical tasks including interdisciplinary fields	UC-2 Ability to make projects and realize complex researches including interdisciplinary ones, on the bases of holistic systemic scientific worldview and using the achievements of history and philosophy of science	UC-3 Readiness to take part in Russian and international research teams to attain scientific and educational tasks	UC-4 Readiness to use modern methods and techniques of scientific communication on state and foreign languages	UC-5 Ability to plan and solve task of professional and personal self-development
Block 1.	Basic Standard					
	Foreign Language			+	+	
	History and Philosophy of Science	+	+			+
	Variation Standard					
	Methodology of Scientific Research	+	+			
	Priority Areas of Chemistry	+				
	Method of teaching chemistry in Higher School					+
	Physical chemistry	+				
	Optional Subjects					
	Kinetics and catalysis of heterogeneous reactions	+				
	Solid chemistry	+				

	Physical and chemical methods of research in catalysis and adsorption	+				
	Stereochemistry of organic compounds	+				
Block 2.	Training					
	Scientific Training		+			
	Pedagogical Training					+
Block 3.	Scientific Research		+			+
Block 4.	State exam and PhD Thesis					
	State Exam	+				+
	PhD Qualification Thesis and Presentation	+	+	+	+	+

		General Professional Competences		
		GPC-1 Ability to fulfill independently scientific research activity corresponding to the professional field using modern methods and IT technology	GPC-2 Readiness to organize teamwork of a research group in the fields of chemistry and related sciences	GPC-3 Readiness to teach students according to main higher educational programmes
Block 1.	Basic Standard			
	Foreign Language			
	History and Philosophy of Science			
	Variation Standard			
	Methodology of Scientific Research	+		
	Priority Areas of Chemistry	+		
	Method of teaching chemistry in Higher School			+
	Physical chemistry			
	Optional Subjects			

	Kinetics and catalysis of heterogeneous reactions			
	Solid chemistry			
	Physical and chemical methods of research in catalysis and adsorption			
	Stereochemistry of organic compounds			
Block 2.	Training			
	Scientific Training	+	+	
	Pedagogical Training			+
Block 3.	Scientific Research	+	+	
Block 4.	State exam and PhD Thesis			
	State Exam			+
	PhD Qualification Thesis and Presentation	+	+	

		Professional Competences			
		PC-1 Competence in methodology of both theoretical and experimental research in the field of chemistry, competence in culture of chemical research.	PC-2 Ability to conduct self-sustained research and obtain scientific results that meet the established requirements for the content of dissertations for the phd degree in the selected profile (scientific specialty).	PC-3 Experience in professional discussions, compiling scientific results into a report, preparing publications in peer-reviewed Russian and international journals .	PC-4 Ability to apply fundamental scientific knowledge in the field of chemistry and related sciences in the implementation of teaching activities; knowledge of teaching methods and the development of teaching materials of disciplines in the field of chemistry.
Block 1.	Basic Standard				
	Foreign Language				
	History and Philosophy of Science				
	Variation Standard				
	Methodology of Scientific Research	+	+		
	Priority Areas of Chemistry	+	+		
	Method of teaching chemistry in Higher School				+
	Physical chemistry	+			
	Optional Subjects	+			

	Kinetics and catalysis of heterogeneous reactions	+			
	Solid chemistry	+			
	Physical and chemical methods of research in catalysis and adsorption	+			
	Stereochemistry of organic compounds				
Block 2.	Training				
	Scientific Training		+	+	
	Pedagogical Training				+
Block 3.	Scientific Research		+	+	
Block 4.	State exam and PhD Thesis				
	State Exam			+	+
	PhD Qualification Thesis and Presentation	+	+	+	