

# Petrochemistry and catalysis, physicochemical methods of research in chemistry

## Kazan (Volga Region) Federal University

Degree or qualification is awarded: **Master**

Language of study: **Russian**

Mode of study: **full-time**

Duration: **2 years**

Availability of free education: **no**

Price: **180 840 rubles per year**

Programme webpage at the university website:

<https://kpfu.ru/eng/academic-units/natural-sciences/alexander-butlerov-institute-of-chemistry>

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### ***Purpose of the educational program***

The "Petrochemistry and Catalysis" program trains specialists in the field of catalysis in petrochemistry and oil refining, organic synthesis.

### ***Why choose this program?***

Students acquire fundamental knowledge in the field of chemistry, as well as homogeneous and heterogeneous catalysis, modern catalytic processes for processing hydrocarbon raw materials, organic and petrochemical synthesis, implemented at petrochemical enterprises of the Russian Federation. The training of specialists focuses on the physical and chemical foundations of modern applied and engineering catalysis, the implementation and implementation of catalytic processes in petrochemicals, the development of modern methods for selecting and analyzing catalysts for petrochemicals, predicting their catalytic action, and the ability to create innovations and breakthrough technologies of tomorrow.

### ***Description of the educational process***

The "Petrochemistry and Catalysis" program provides for the study of disciplines:

The Foundation of petrochemical industry

- Modern chemical production facilities
- Physical and chemical research methods in catalysis
- Basic design of catalysts
- Homogeneous and heterogeneous catalysis
- Kinetics and mechanism of catalytic reactions
- Technique of catalytic experiments

- Features of operation of catalysts
- Surface chemistry and adsorption
- Catalysis in nanotechnology
- Catalytic processes in petrochemicals

Practical and laboratory classes are held in laboratories equipped with modern devices and equipment for sorption and catalytic processes "Petrochemistry and Catalysis" research center on topics relevant and promising for the chemical industry.

### ***Skills that students will receive after completing the educational program***

Advantages of training in the program "Petrochemistry and Catalysis":

- Getting in-depth knowledge in the theories of homogeneous, heterogeneous, catalysis, the principles of catalytic action, theoretical ideas about the features of catalytic activation of substances;
- Getting practical experience working on modern scientific equipment;
- The opportunity to engage in research work during the entire period of study, participation in research projects;
- Gain experience in planning theoretical and experimental research;
- Gain experience in compiling reports on scientific activities, including in the form of scientific publications and reports at scientific conferences, writing a final master's thesis;
- Training and research work under the guidance of leading teachers and researchers of KFU and RAS, partner universities;
- Mastering modern approaches to solving modern problems that are in demand by employers in various fields of chemistry, biology, and medicine.

### ***Areas of professional activity where graduates have advantages***

Those who successfully complete the "Petrochemistry and Catalysis" program can find work in research laboratories of universities, institutes of the Russian Academy of Sciences and the Academy of Sciences of the Republic of Tatarstan, laboratories of state and non-state research centers that conduct research in the field of catalysis, petrochemistry, oil refining, organic synthesis and related fields; in various industrial enterprises and associations of the chemical industry, petrochemistry, oil refining, organic synthesis, and inorganic synthesis, which use catalytic processes and catalysts. (PJSC "Nizhnekamskneftekhim", PJSC "Kazanorgsintez", PJSC "Tatneft", JSC "NK "Rosneft", JSC "novokuibyshevsky oil refinery", LLC "Catalyz-Prom", etc.).

### **Specializations within this programme**