1.4.4. Physical Chemistry

Уровень Training level: aspirantura
Form of training: aboutchnaya
Duration of training: 4 years old
Group of scientific specialties: *Chemical Sciences*
Number of seats: 1 (contract)

Program Description

The purpose of mastering the postgraduate program is to write, design and submit for the defense of a dissertation for the degree of Candidate of Sciences, containing the solution of a scientific problem that is important for the development of physical chemistry.

Physical chemistry is a branch of chemical science dealing with general laws that determine the structure of substances, the direction and rate of chemical transformations under various external conditions; quantitative interactions between the chemical composition, structure of a substance and its properties. The theoretical basis of physical chemistry is the general laws of physical science. It includes the study of the structure of molecules of matter, chemical thermodynamics and chemical kinetics.

The program is aimed at comprehensive and high-quality training of scientific and scientific-pedagogical personnel in the following areas:

1. Experimental determination and calculation of the parameters of the structure of molecules and the spatial structure of substances by quantum chemical methods.

2. Experimental determination of thermodynamic properties of substances, calculation of thermodynamic functions of simple and complex systems, including on the basis of quantum chemical calculations, statistical thermodynamics, study of thermodynamics of phase transformations and phase transitions.

3. Determination of thermodynamic characteristics of surface processes, determination of the laws of adsorption at the interface and formation of active centers on such surfaces.

4. Theory of solutions, intermolecular and interparticle interactions.

5. Macrokinetics, mechanisms of complex chemical processes, physico-chemical hydrodynamics, dissolution and crystallization.

6. Relationship of reactivity of reagents with their structure and conditions of chemical reaction.