

Study program: Chemistry			
Type and level of studies: PhD			
Course unit: The kinetics and mechanism of substitution reactions			
Teacher in charge : Živadin D. Bugarčić			
english			
ECTS:10			
Prerequisites: No prerequisites			
Semester Winter Semester			
Course unit objective The objective of the subject kinetics and mechanism of the substitution reaction is that students learn, understand and master the material that they have been taught. It is necessary for students to build on previously acquired knowledge, which they will use in future scientific research.			
Learning outcomes of Course unit Through the subject kinetics and mechanism of substitution reactions, students will be trained in theoretical scientific research in this field and will acquire experimental skills to independently test kinetics and mechanism of various substitution reactions. The student will be qualified for the study of the kinetics and mechanism of substitution reactions using different experimental methods and for computer processing of the measured results, as well as search for scientific and technical literature in this field.			
Course unit contents It will be studied in detail: Chemical kinetics. The kinetics and equilibrium. Order and Molecularity of reactions. The influence of different physical and chemical parameters on the rate of chemical reactions (temperature, pressure, ionic strength, the nature of the solvent, pH, micelles, etc.). Experimental methods in chemical kinetics for fast and slow chemical reactions. Mathematical processing of experimental data. Application of various computer programs for processing kinetic data. Bond between activation parameters and the type of mechanism. Transition state theory. Substitution reactions of the octahedral complex. Substitution reactions of a square planar complex. The substitution reactions of tetrahedral complexes. Kinetics of the substitution reactions of transition metal complexes with biologically important ligands. Redox reactions. Complementary and non-complementary reactions. Multiple electron transfer. The reductive elimination and oxidative addition. Stereochemistry of exchanges reactions. Reactions of solvent exchange and complexation. Seminar papers: Seminar papers will be related to the study of the mechanism of different substitution and redox reactions of complexation of transition metal ions (UV-VIS spectrophotometry, NMR spectroscopic method and HPLC)			
Literature 1. Tobe, M. L. и Burgess, J.: Inorganic Reaction Mechanisms, Addison Wesley Longman Inc., Essex, 1999. 2. Connors, K. A.: Chemical Kinetics, The Study of Reaction Rates in Solution, VCH, Weinheim, 1990..			
Number of active teaching hours			Other classes
Lectures: 5	Practice:	Other forms of classes: <i>(for example: mentoring system)</i>	
Independent work:			
Teaching methods			
Examination methods (maximum 100 points)			
Exam prerequisites	No. of points:	Final exam	No. of points:
Student's activity during lectures	10	oral examination	40
practical classes/tests		written examination	20
Seminars/homework	30	
Project			
Other			

Grading system		
<i>(додати систем оцењивања у складу са правилником Факултета)</i>		
Grade	No. of points	Description
10	91-100	Excellent
9	81-90	Exceptionally good
8	71-80	Very good
7	61-70	Good
6	51-60	Passing
5	...	Failing

(Table 5.2) Course unit description