Level: bachelor

Course title: Coordination Chemistry

Status: elective

ECTS: 8

Requirements: none

Learning objectives

Gaining knowledge of modern chemistry, structure and application of coordination compounds.

Learning outcomes

Upon successful completion of this course, students should be able to:

1. define special classes of organic ligands and explain the methods of synthesis;
2. explain the type of chemical bond in complex compounds;
3. explain the methods of synthesis of complex compounds;
4. perform physico-chemical analysis of the ligands and their metal complexes;
5. describe the application of the characteristic of complex compounds.

Syllabus

Theoretical instruction

Types of ligands and coordination compounds. Metal complexes with non-macro- and macrocyclic organic ligands (crunands, cryptands, dendrimers). Organometallic compounds (carbonyls, metallocenes, etc.).

Theories of chemical bonding of coordination compounds. Valence bond, ligand field and molecular orbital theory. The reaction mechanisms, methods of synthesis (non-template and template synthesis methods and reactions of coordinated ligands, transmetallation and demetallation of the complexes) and methods of characterization of coordination compounds. Application of the complexes in medicine and as a catalyst in industrial organic chemistry.

Practical instruction

Synthesis of different types of complex compounds of transition metals and their characterization. Synthesis and characterization of geometric and optical isomers.

Weekly teaching load				Other:
Lectures: 2	Exercises: 3	Other forms of teaching: 1	Student research:	