

Ministry of Higher Education and Scientific research



Coursebook

Department of ...Chemistry.....

College ofEducation.....

University ofSalahuddin-Erbil.....

Subject: Reaction and mechanism of coordination Chemistry

Course Book – (3rdYear) / 2nd course

Lecturer's name Dr. Hikmat Ali Mohamad (Ph.D.)

Academic Year: 2022/2023

1. Course name	Reaction and mechanism of coordination Chemistry
2. Lecturer in charge	Dr.Hikmat Ali Mohamad
3. Department/ College	Chemistry / Education
4. Contact	e-mail:Hikmat.mohamad@su.edu.krd Tel:+964 770 13193 28)
5. Time (in hours) per week	Theory: 0 Practical: 3 + 3
6. Office hours	2
7. Course code	
8. Teacher's academic profile	BSc.: 1989, Salahuddin University – Erbil- Iraq MSc. (Analytical Chemistry), 1997, Su, Erbil- Iraq PhD, 2007(Inorganic Chemistry), 2007, University of Baghdad, Baghdad –Iraq Assist Lecture :1997 Lecturer: 2004 Assist prof : 2010 Professor: 2018 Post graduate Supervision : Msc ; 15, PhD ;3 , Diploma ;1 <u>Conferences: 15</u> Skill: A A, NMR spectroscopy, X-Ray <u>diffraction</u> for single crystal . Examiner Committee Post graduate, More than 100
9. Keywords	1st year , inorganic chemistry, education
10. Course overview:	If organic chemistry is considered to be the ‘chemistry of carbon’, then inorganic chemistry is the chemistry of all elements except carbon. In its broadest sense, this is true, but of course there are overlaps between branches of chemistry Inorganic chemistry is not simply the study of elements and compounds; it is also the study of physical principles. For example, in order to understand why some compounds are soluble in a given solvent and others are

not, we apply laws of thermodynamics. If our aim is to propose details of a reaction mechanism, then a knowledge of reaction kinetics is needed. Overlap between physical and inorganic chemistry is also significant in the study of molecular structure. In the solid state, X-ray diffraction methods are routinely used to obtain pictures of the spatial arrangements of atoms in a molecule or molecular ion. To interpret the behaviour of molecules in solution, we use physical techniques such as nuclear magnetic resonance (NMR) spectroscopy; the equivalence or not of particular nuclei on a spectroscopic timescale may indicate whether a molecule is static or undergoing a dynamic process in this text, we describe the results of such experiments but we will not

The aim of study of Inorganic Chemistry is:

1. The study of introduction mechanism of coordination chemistry.
2. The study stability e of coordination compounds.
3. Adopt idea that describes of complex structures.
4. The study of mechanism metal ion complexes.

11. Course objective:

At the end of the course students will be able to:

- Explain of stability of metal complexes.
- Use the skills development in the explanation of reactivity of chemical behaviours of prepared complexes.
- To provide experience kinetic of coordination compounds.
- To obtain necessary information about SN^1 , SN^2 mechanism.
- Focus on the type of crystals, in order to knowing some properties of them which related to the nature of the crystal.

12. Student's obligation

*** The students must be attending lecture 3 hours weekly in inorganic laboratory.**

*** All students must get monthly and daily examination. They also may be participate in discussion and conclusion.**

*** Final exam will be determined the exam board**

13. Forms of teaching

Different form of teaching will be used to reach the objectives of the course, discussion and conclusion, and practical skills Etc.

14. Assessment scheme

The students are required to do closed book exam at the mid of the semester

15. Student learning outcome:

The students learning during this course:

- 1- Mechanism of coordination compounds.**
- 2- Solving questions in experimental**
- 3- Understanding knowledge about reactivity of coordination compounds.**
- 4- Explanation of covalent-coordination bond strength .**

Second Course	
1	Preparation of chloropentaamminecobalt (III) chloride [Co (NH ₃) ₅ Cl] Cl ₂
2	Preparation of nitropentaamminecobalt (III) chloride [Co (NH ₃) ₅ NO ₂] Cl isomer.
3	Determination of M: L by Mole Ratio Method
4	he method of continues variations (Job's Method) for determination of Stoichiometry.
5	Determination of ammonia in [Cu (NH ₃) ₄] SO ₄ .H ₂ O complex.
6	Exam.
7	Determination of copper in [Cu (NH ₃) ₄] SO ₄ .H ₂ O complex

8	Preparation $[\text{VO}(\text{acac})_2]$ complex
9	Preparation $\text{K}_3[\text{Al}(\text{C}_2\text{O}_4)_3] \cdot 3\text{H}_2\text{O}$ complex.
10	Bioinorganic Chemistry: synthesis of an oxygen-carrying Co complex
11	Crystal Field Theory and the Spectrochemical Series for Cobalt (III) Complexes
12	Tris-2,2'-bipyridine Complexes of Iron (II) and Ruthenium (II): Synthesis, Spectroscopy and Electrochemistry
13	Exam
14	Presentation
15	
16	

17. Extra notes:

*** We suggest that each examination may be after the end of course (30 hours)**