

CENTRAL UNIVERSITY OF KERALA
DEPARTMENT OF CHEMISTRY
M.Sc. CHEMISTRY

Course Code	Course Title	Contact hrs. / wk.				Credits
		Lect.	Lab	Tut	Total	
CHE 5391	Inorganic Chemistry Laboratory - II		5			2

Lec = Lecture, Tut = Tutorial, Lab = Practical

This is a participatory, experimental, and [employability based skill development course](#).

Course objective:

Objective of the course is to develop practical and laboratory skills of the student in inorganic chemistry.

By completing this course, students will obtain the following course/learning outcomes:

- Understand the strategies for the synthesis of various types of inorganic compounds.
- Synthesis and characterization of new inorganic complexes.
- [Develop laboratory and analytical skills required for carrying out synthesis in inorganic chemistry research.](#)

Grading:

Laboratory Experiments – 20%

Record of observations and reporting – 10%

Viva evaluation – 10%

End Semester Assessment – 60%

CHE 5391 Inorganic Chemistry Laboratory– II

Syllabus Modules:

Synthesis of inorganic complexes and their characterization by various physicochemical methods, such as IR, UV, Visible, NMR, magnetic susceptibility etc.

H₂ Salen-based complexes

Nickel (II) complexes of H₂ Salen

Copper (II) complexes of H₂ Salen

Cobalt (II) complexes of H₂ salen and its oxygen binding

Amine based Complexes

Hexamminecobalt(III) chloride

Pentamminechlorocobalt(III) chloride

Nitritopentamminecobalt(III) chloride

Nitropentamminecobalt(III) chloride

8-Hydroxyquinoline (L) based complexes

Aluminium (III) oxine [$\text{Al}^{3+}(\text{L})_3$]

Iron (III) oxine [$\text{Fe}^{3+}(\text{L})_3$]

Zinc (II) oxine [$\text{Zn}^{2+}(\text{L})_3$]

Acetylacetonate based complexes

Vanadium (IV)oxy acetylacetonate

Tris(acetylacetonato) Manganese (II) / Tris(acetylacetonato) Manganese (III)

Tris(acetylacetonato) aluminium (III)

Tris(acetylacetonato) iron(III)

Tris(acetylacetonato) chromium (III)

Other complexes / materials

Potassium copper(II) oxalate complexes

Optical isomers of tris(ethylenediamine)cobalt(III)chloride

Tris(oxalate) manganese(III)

Tris(thiourea) copper(I) sulphate

Preparation of MnO_2 nanoparticles using Cetyltrimethylammonium bromide surfactant

Preparation of zeolite, clay materials

Preparation of potassium bis(peroxo)-oxo-(1,10-phenothroline) vanadium (V) trihydrate

Preparation of 12-tungstosilicic acid

Selection can be made from the above specified or any other complexes for which references are available in the literature.

Attempts will also made to interpretation of electronic spectrum of transition metal complexes and the calculation of Dq values. Determination of crystal field splitting energy for certain ligands and construction of a part of the spectrochemical series.

References

1. G. Pass and H. Sutcliffe. Practical Inorganic Chemistry 2ndEdn., Chapman & Hill. 1974.
2. G. Marr and B. W. Rockett. Practical Inorganic Chemistry, Van Nostrand, 1972.