

| DEPARTMENT OF CHEMISTRY | | | | CLASS: I M.Sc. Chemistry | | | | |
|-------------------------|-----------------|-------------|--|--------------------------|--------------------|-----|-----|-------|
| Sem | Course Type | Course Code | Course Title | Credits | Contact Hours/week | CIA | Ext | Total |
| II | Major Practical | 21P2CMP4 | Inorganic Estimation & Complex Preparation | 2 | 4 | 40 | 60 | 100 |

| Nature of Course | | | |
|---------------------|---|--|---------------------------|
| Knowledge and skill | ✓ | | Employability oriented |
| Skill oriented | ✓ | | Entrepreneurship oriented |

Course Objectives: To expose the students to experiments in inorganic estimations and complex preparation by employing volumetric skills and preparing complex.

Objectives: *The objective of this course is to make the student*

- (i) *To demonstrate basic laboratory technique of titration*
- (ii) *To develop the intellectual and psychomotor skills of the students by imparting knowledge in quantitative analysis.*
- (iii) *To examine the quantitative estimation of inorganic cations through volumetric techniques.*
- (iv) *To practice the preparation of simple co-ordination compounds*

LIST OF EXPERIMENTS

Complexometry:

1. Estimation of Magnesium by EDTA Method.
2. Estimation of Calcium by EDTA Method
3. Estimation of Zinc by EDTA Method.
4. Estimation of Nickel by EDTA method (direct and indirect methods)
5. Estimation of Copper by EDTA method

Inorganic Complexes Preparation

1. Preparation of hexathioureaplumbous nitrate.
2. Preparation of thiourea cuprous chloride.
3. Preparation of trithiourea cuprous sulphate.
4. Preparation of pentathioureadicuprous nitrate.
5. Preparation of sodium hexanitrocobaltate

Books for reference:

1. O.P. Pandey, N. Bajpai, S. Giri, "Practical Chemistry" S. Chand and Co Ltd., ISBN: 9788121908122, 9788121908122, 2010.
2. Henry W. Schimpf "A text book of volumetric analysis", Biolife Publishers, ISBN: 978-1117262451, 1117262456, 2009.
3. Peter Mc Pherson, "Practical volumetric analysis" RSC publications, ISBN: 978-1849739146, 1849739145, 2014.

- V. Venkateswaran , R. Veeraswamy, A.R. Kulandaivelu, Basic Principles of Practical Chemistry, S. Chand & Co., New Delhi,1997.
- R.Gopalan, V. Ramalingam , Concise Coordination Chemistry' Vikas Publishing House PVT LTD, Noida, 2010.

Web resources:

- <http://www.federica.unina.it/agraria/analytical-chemistry/volumetric-analysis/>
- <https://byjus.com/chemistry/volumetric-analysis/>
- <https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-cy02/>
- <https://chemistry.tcd.ie/assets/pdf/Preliminary%20Course/Titration%20Demonstration.pdf>

Pedagogy : Demonstration and practical session.

Rationale for Nature of the course

This course will enable the students to comprehend the basic knowledge of inorganic estimations through volumetric analysis using EDTA and complex preparation. They will acquire skills through titrimetric methods by connecting the principles of inorganic synthesis.

Activities having direct bearing on Skill development/ Employability/Entrepreneurship

The knowledge of volumetric analysis and basic principles of complex preparation develops the students approach towards the estimation of metal ions like Mg, Ca, Cu and Ni. The students will acquire hand on experience on preparation of simple inorganic complexes.

Course outcomes: After complete successful of this course, the student will be able

| CLOs | CLO statement | Knowledge level |
|------|--|-----------------|
| CLO1 | To demonstrate the basic laboratory techniques of volumetric analysis of given samples. | Up to K2 |
| CLO2 | To estimate the amount of metal ions such as Zinc, Magnesium and Copper present in the given solution by EDTA volumetric method. | Up to K3 |
| CLO3 | To understand the preparation of inorganic complex | Up to K3 |
| CLO4 | To interpret analytical data | Up to K4 |
| CLO5 | To communicate the finding | Up to K2 |

Mapping of CLOs with PLOs

| # | PLO-1 | PLO-2 | PLO-3 | PLO-4 | PLO-5 |
|-------|-------|-------|-------|-------|-------|
| CLO-1 | 2 | 3 | 1 | 2 | 2 |
| CLO-2 | 2 | 3 | 1 | 2 | |
| CLO-3 | 3 | 3 | 1 | 3 | 1 |
| CLO-4 | 2 | 2 | 1 | 2 | 1 |
| CLO-5 | 2 | 1 | 1 | 1 | 1 |

Advance application- 3; Intermediate level-2;

Basic level-1

Evaluation:

| | | |
|--------------------------------|---|-----------|
| Continuous Internal Assessment | : | 40 Marks |
| External Assessment | : | 60 Marks |
| Total | : | 100 Marks |

Formative Assessment:

| CIA Components | Marks |
|-----------------------------|-----------|
| Internal Test | 20 |
| Observation/Record | 10 |
| Continuous class assessment | 10 |
| Total Marks | 40 |

Summative Assessment:

| CLOs | CLO statement | Knowledge level | Marks |
|------|--|-----------------|-----------|
| CLO1 | To demonstrate the basic laboratory techniques of volumetric analysis of given samples. | Up to K2 | 10 |
| CLO2 | Estimate the amount of metal ions such as like Zinc, Magnesium and Copper present in the given solution by EDTA volumetric method. | Up to K3 | 10 |
| CLO3 | To understand the preparation of inorganic complex | Up to K3 | 15 |
| CLO4 | To interpret analytical data | Up to K4 | 20 |
| CLO5 | To communicate the finding | Up to K2 | 5 |
| | Total Marks | | 60 |

Name of the Course Designers

1. Dr. A. Xavier
2. Dr. P. Gajendran.