

UNIVERSITY OF MADRAS
M.Sc. DEGREE PROGRAMME IN CHEMISTRY
SYLLABUS WITH EFFECT FROM 2023-2024

Title of the Course	INORGANIC CHEMISTRY PRACTICAL						
Paper No.	Core VI						
Category	Core	Year	I	Credits	4	Course Code	424C2C
		Semester	II				
Instructional hours per week	Lecture	Tutorial	Lab Practice		Total		
	-	1	4		5		
Prerequisites	Basic principles of gravimetric and qualitative analysis						
Objectives of the course	<p>To understand and enhance the visual observation as an analytical tool for the quantitative estimation of ions.</p> <p>To recall the principle and theory in preparing standard solutions.</p> <p>To train the students for improving their skill in estimating the amount of ion accurately present in the solution</p> <p>To estimate metal ions, present in the given solution accurately without using instruments.</p> <p>To determine the amount of ions, present in a binary mixture accurately.</p>						
Course Outline	<p>UNIT-I: Analysis of mixture of cations: Analysis of a mixture of four cations containing two common cations and two rare cations. Cations to be tested.</p> <p>Group-I : W, Tl and Pb.</p> <p>Group-II : Se, Te, Mo, Cu, Bi and Cd.</p> <p>Group-III : Tl, Ce, Th, Zr, V, Cr, Fe, Ti and U.</p> <p>Group-IV : Zn, Ni, Co and Mn.</p> <p>Group-V : Ca, Ba and Sr.</p> <p>Group-VI : Li and Mg.</p>						
	<p>UNIT-II: Preparation of metal complexes: Preparation of inorganic complexes:</p> <p>a. Preparation of trithioureacopper(I)sulphate</p> <p>b. Preparation of potassium trioxalate chromate(III)</p> <p>c. Preparation of tetramminecopper(II) sulphate</p> <p>d. Preparation of Reineck's salt</p> <p>e. Preparation of hexathioureacopper(I) chloridedihydrate</p> <p>f. Preparation of <i>cis</i>-Potassium tri oxalate diaquachromate(III)</p> <p>g. Preparation of sodium trioxalato ferrate(III)</p> <p>h. Preparation of hexathiourealead(II) nitrate</p>						

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Course Outline	UNIT-III: Complexometric Titration: 1. Estimation of zinc, nickel, magnesium, and calcium. 2. Estimation of mixture of metal ions-pH control, masking and demasking agents. 3. Determination of calcium and lead in a mixture (pH control). 4. Determination of manganese in the presence of iron. 5. Determination of nickel in the presence of iron. 6. Hardness of water
Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper)	Questions related to the above topics, from various competitive examinations UPSC / TRB / NET/ UGC-CSIR / GATE /TNPSC others to be solved (To be discussed during the Tutorial hours)
Skills acquired from this course	Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.
Recommended Text	1. V. V. Ramanujam, <i>Inorganic Semimicro Qualitative Analysis</i> ; 3rded., The National Publishing Company, Chennai, 1974. 2. <i>Vogel's Text book of Inorganic Qualitative Analysis</i> , 4thed., ELBS, London. 3. A. JeyaRajendran, <i>Microanalytical Techniques in Chemistry: Inorganic Qualitative Analysis</i> , United global publishers, 2021.
Reference Books	1. G. Pass, and H. Sutcliffe, <i>Practical Inorganic Chemistry</i> ; Chapman Hall, 1965. 2. W. G. Palmer, <i>Experimental Inorganic Chemistry</i> ; Cambridge University Press, 1954.
Course Learning Outcomes (for Mapping with POs and PSOs) Students will be able: CO1: To identify the anions and cations present in a mixture of salts. CO2: To apply the principles of semi micro qualitative analysis to categorize acid radicals and basic radicals. CO3: To acquire the qualitative analytical skills by selecting suitable confirmatory tests and spot tests. CO4: To choose the appropriate chemical reagents for the detection of anions and cations. CO5: To synthesize coordination compounds in good quality.	

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CO-PO Mapping (Course Articulation Matrix)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO 1	S	S	S	S	M	S	S	S	S	M
CO 2	M	S	S	S	S	M	S	S	S	S
CO 3	S	S	M	S	S	S	S	M	S	S
CO 4	M	S	S	S	S	M	S	S	S	S
CO 5	M	S	M	S	S	M	S	M	S	S

3 – Strong, 2 – Medium, 1 - Low

Level of Correlation between PSO's and CO's

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

3 – Strong, 2 – Medium, 1
– Low