

Title of the Course: Lab Course in Inorganic Chemistry

Effective from AY: 2018-19

Prerequisites for the course:	Students should have studied the courses in chemistry at F.Y. B.Sc., S.Y.B.Sc. and T.Y.B.Sc. levels so as to have basic knowledge of experimental chemistry.	No. of lectures
Course Objectives:	Students shall be trained in the preparation of coordination compounds / double salts, understanding of redox chemistry, determination of metal content and degree of hydration, and determination of the formula of synthesized compounds. Students will be given hands-on experience in using colorimeter / UV-Vis spectrophotometer while performing instrumental analysis.	
Course Outcomes:	1. Students should be in a position to: i) set up and perform inorganic synthesis ii) isolate and purify crystalline product. iii) develop skills for compound characterization iv) determine the metal content by titrimetry / gravimetry /colorimetry.	
Content:	Synthesis of inorganic compounds (any six) 1. $[\text{Ni}(\text{NH}_3)_6]\text{Cl}_2$ 2. $[\text{Co}(\text{en})_3]\text{Cl}_3 \cdot x\text{H}_2\text{O}$ 3. $[\text{Co}(\text{NH}_3)_3(\text{NO}_2)_3]\text{Cl}_3$ 4. $\text{K}_3[\text{Al}(\text{C}_2\text{O}_4)_3] \cdot 3\text{H}_2\text{O}$ 5. $\text{K}_3[\text{Cr}(\text{SCN})_6] \cdot 4\text{H}_2\text{O}$ 6. $\text{K}_3[\text{Cr}(\text{C}_2\text{O}_4)_3] \cdot 3\text{H}_2\text{O}$ 7. $[\text{Cr}(\text{OAc})_2]_2 \cdot 2\text{H}_2\text{O}$ 8. Potash alum from scrap aluminium 9. Zinc iodide (Redox synthesis) Quantitative estimations/determinations (any six) 1. Estimation of Ni in $[\text{Ni}(\text{NH}_3)_6]\text{Cl}_2$ titrimetry/gravimetry 2. Estimation of Co in $[\text{Co}(\text{en})_3]\text{Cl}_3 \cdot x\text{H}_2\text{O}$ volumetrically 3. Estimation of oxalate in $\text{K}_3[\text{Al}(\text{C}_2\text{O}_4)_3] \cdot x\text{H}_2\text{O}$ or $\text{K}_3[\text{Cr}(\text{C}_2\text{O}_4)_3] \cdot x\text{H}_2\text{O}$ 4. Estimation of nitrite by redox titration 5. Estimation of calcium in calcite ore 6. Estimation of copper in gun metal alloy or Devarda's alloy iodometrically 7. Estimation of Cr in chrome alum and $\text{K}_3[\text{Cr}(\text{C}_2\text{O}_4)_3] \cdot x\text{H}_2\text{O}$ to determine degree of hydration. 8. Colorimetric determination of Cr or Ni	24 hr 24 hr
Pedagogy:	Students should be given suitable pre-lab and post-lab assignments and explanation revising the theoretical aspects of laboratory experiments prior to the conduct of each experiment. Each experiment should preferably be done individually by the students.	
Text Books / Reference Books	1. J. Mendham, R.C. Denney, J.D. Barnes, M.J. K. Thomas, <i>Vogel's Text Book of Quantitative Chemical Analysis</i>, 2002, 6th Ed. 2. G. Brauer, <i>Handbook of Preparative Inorganic Chemistry</i>, 1963, Vol . 1 & 2. 3. G. Pass & H. Sutcliffe, <i>Practical Inorganic Chemistry, Preparations, Reactions and Instrumental Methods</i>, Chapman & Hall, 1974, 2nd Ed. 4. A. J. Elias, <i>General Chemistry Experiments</i>, University Press, 2008, Revised Ed. 5. S. DeMeo, J. Chem. Ed., Vol 80, 2003, Pg. No. 796-798. 6. W. L. Jolly, <i>The Synthesis & Characterization of Inorganic Compounds</i>, Prentice-Hall. INC. 1970.	