CHM-233(P) – Chemistry Practical

Chemistry Lab- I (2 credit) + Chemistry Lab- II (2 credit)

Total Credit – 4, Hours – 120, Marks = 100

Course Outcomes:

After the completion of this course, student will be able to-

CO-1. Gain the fundamental and basic knowledge of inorganic qualitative analysis, chemical kinetics and Physico-chemical experiments.
CO-2. Understand the basic concepts and principles of cations and anions of inorganic salts, conductometer, pH-meter, Viscometer and refractometer.
CO-3. Apply the skill of separation of cations and anions present in an inorganic mixture and also handle different instruments like conductometer, pH-meter, Viscometer and refractometer.
CO-4. Analyse and conclude the facts regarding the inorganic qualitative analysis, chemical kinetics, adsorptions, hydrolysis, partition coefficient of an organic acid.
CO-5. Evaluate, judge and defend the different types of tests involves in the separation of inorganic radicals, Conductometric titrations and different types of physico-chemical experiments.
CO-6. Synthesise, Create, modify and develop the new techniques for the separation of inorganic radicals and also in the use of different instruments like conductometer, pH-meter, Viscometer and refractometer.

CO-PSO mapping (connecting COs with PSOs)

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	3	2	3	2	2
CO-2	3	3	2	2	2	3
CO-3	2	3	3	2	3	2
CO-4	3	2	3	3	2	3
CO-5	3	2	3	2	2	3
CO-6	3	3	3	2	2	3

CHEMISTRY LAB – I

Credit – 2, Hours – 60, Marks - 50

Inorganic qualitative analysis for inorganic Mixture

Semi micro method of analysis of inorganic mixture containing four radicals (Excluding phosphate, borate, arsenite, arsenate)
Minimum twelve mixtures should be performed.

Inorganic Preparations

(1) Tetrammine cupric sulphate $[Cu(NH_3)_4SO_4]$. H2O
(2) Ferrous ammonium sulphate (Mohr's salt) $FeSO_4(NH_4)_2SO_4$. $6H_2O$
(3) Hexa-ammine nickel(II) chloride $[Ni(NH_3)_6]$ Cl_2
(4) Potash Alum $K_2SO_4.Al_2(SO_4)_3$. $24H_2O$
(5) Reineck's salt (Ammonium tetrathiocyanato diamine chromate) $NH_4(NH_3)_2Cr(CNS)_4$
(6) Sodium cobaltinitrite $Na_3[Co(NO_2)_6]$

Viva-Voce questions

CHEMISTRY LAB – II

Credit – 2, Hours – 60, Marks - 50

PHYSICAL CHEMISTRY PRACTICAL

Minimum twelve practicals should be performed

(1) To determine the relative strength between HCl and H_2SO_4 by studying hydrolysis of methyl acetate.
(2) To determine the temperature coefficient of hydrolysis of methyl acetate catalysed by acid.
(3) Study the kinetics of saponification of ethyl acetate
(4) To study the adsorption of an organic acid by animal charcoal (Acetic acid/Oxalic acid).
(5) To study the partition coefficient of benzoic acid in benzene or kerosene.
(6) To determine water equivalent of thermos flask and heat of weak acid using strong acid and base.
(7) To determine cell constant of conductometer by using KCl solution.
(8) Conductometric titration of strong acid → strong base (HCl → NaOH)
(9) Conductometric titration of weak acid → strong base (CH_3COOH → NaOH)
(10) Conductometric titration of mixture of acids→ strong base ($HCl + CH_3COOH$) → NaOH)
(11) Determine the concentration of given NaCl conductometrically using 0.1N $AgNO_3$ solution.

(12) To determine specific refraction and molar refraction of liquid A, B and its mixture.
(13) To determine the atomic refractivities of Carbon, Hydrogen and Oxygen by taking methyl acetate, ethyl acetate and n-hexane as the experimental liquids.
(14) To determine absolute viscosities of liquid A, B and its mixture.
(15) To determine the surface tensions of liquids by using stalagmometer.

Viva-Voce questions

REFERENCE BOOKS

1. '**Vogel's Qualitative analysis' by G. Svehla,** Pearson Education Ltd., Seventh Edition,2009
2.'**Vogel's Textbook of Quantitative Chemical analysis'** Revised by G. H. Jeffery, J. Bassett, J. Mendham & R. C. Denney, ELBS (English Language Book Society) Longman. 5th Ed., New York.
3.**'Analytical Chemistry'** by Dhruba Charan Dash, 2011, 2th Ed., PHI Learning Private Ltd, New Delhi.
4.**'Analytical Chemistry' by Gary D. Christian,** 1986**,** 4th Ed., John Wiley & Sons.
5.'**Advanced Practical Inorganic Chemistry'** by Gurdeep Raj, 9th Ed., Goel Publishing House, Meerut.
6. **'Advanced University Practical Chemistry'** by P. C. Kamboj, Vishal Publishing Co., Jallandhar – Delhi.
7.'**Advance Physical Practical Chemistry'** by J. B. Yadav, Goel Publishing House, Meerut.
8. **'Advances Physical Chemistry Experiments'** by Gurtu – Gurtu, Pragati Prakashan, Meerut.