CHM 122(P): Chemistry Practical

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

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

Course Outcomes:

At the end of the course the student will be able to-

CO -1**.** Gain awareness to GLP

CO -1**.** Understand the identification of functional group of organic substance and also reactions in titration.

CO -3**.** Solve the problems regarding Normality, Molarity, %V/V, %W/V, %W/W.

CO-4. Analyse correlate the facts regarding identification of organic substance and volumetric analysis.

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	2	2	3
CO-2	3	3	2	2	2	3
CO-3	2	2	3	2	3	2
CO-4	3	2	3	3	2	3

Chemistry Lab- I (2 credit)

Credit – 2, Hours – 60, Marks – 50

ORGANIC QUALITATIVE ANALYSIS

Concept of types of organic compound, lassaigne's elements, Organic functional groups, water soluble/ insoluble compounds, Aromatic character,

MP/ BP and their measurement, Chemical properties of different organic compounds.

Organic spotting

Acids:

Solid: Benzoic acid, Salicylic acid**,** Succinic acid, Oxalic acid

Phenol:

Solid: alpha-naphthol & beta-naphthol

Base:

Solid: p-nitroaniline

Liquid: Aniline

Neutral:

Solid: Urea, Thiourea, Naphthalene
Liquid: Acetone, Ethanol, Ethyl acetate, Benzaldehyde, Nitrobenzene, Chloroform

DEMONSTRATION

Purification of organic compounds

1. Simple distillation

Introduction to distillation, Types of distillation, Principle of simple distillation, purification of organic liquid by distillation.

2. Crystallization

Introduction to crystallization, purification of benzoic acid by crystallization.

3. Sublimation

Introduction to Sublimation, purification of Naphthalene by sublimation.

Chemistry Lab- II (2 credit)

Credit – 2, Hours – 60, Marks – 50

Basic awareness to lab instruments, reagents, indicators & lab. technics.

(I) Volumetric Titrations

Preparation of solutions of different Normality, Molarity, %V/V, %W/V, %W/W.

(II) Acid base titrations

1. Na_2CO_3 → 0.1N HCl

2. Estimation of carbonate and bicarbonate together → 0.1N HCl

(III) Redox titration

Preparation of standard solutions of 0.05N $KMnO_4$

1. Std. $KMnO_4$ (0.05N) → Oxalic acid

(IV) Complexometry Titration

Preparation of standard solutions of (0.01M) EDTA.

1. Zn^{++} → Std. EDTA 0.01M)

(V) Iodimetry Titration

Preparation of standard solutions of 0.05N $Na_2S_2O_3.5H_2O$.

1. Iodine → Std. Sodium thiosulphate

(VI) Iodometry Titration

Preparation of standard solutions of 0.05N $Na_2S_2O_3.5H_2O$

1. $CuSO_4.5H_2O$ → Std. $Na_2S_2O_3.5H_2O$ (0.05N)

2. $K_2Cr_2O_7$ → Std. $Na_2S_2O_3.5H_2O$ (0.05N)

Demonstration

Concept of pH, buffer solution, electrodes

1. Demonstration of pH – meter and measurement of pH of o.1N HCl solution.
2. Preparation of an acidic buffer (CH_3COONa - CH_3COOH, pH = 5) and its pH measurement.
3. Preparation of a basic buffer (NH_4Cl - NH_4OH, pH = 10) and its pH measurement.

Viva-Voce questions

REFERENCE BOOKS

1. '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.

2. 'Analytical Chemistry' by Dhruba Charan Dash, 2011, 2th Ed., PHI Learning Private Ltd, New Delhi.

3. 'Analytical Chemistry' by Gary D. Christian, 1986, 4th Ed., John Wiley &Sons.

4. 'Advanced University Practical Chemistry' by P. C. Kamboj, Vishal Publishing Co., Jallandhar – Delhi.

5. I Vogel, "Elementary Practical Organic Chemistry Part-II, Qualitative Organic Analysis", CBS Publishers & Distributers, New Delhi, Second Edition, 2004.

6. V.K. Ahluwalia, Sunita Dhingra, "Comprehensive Practical Organic Chemistry – Qualitative Analysis", University Press (India) Private Limited, Hyderabad, First Indian Edition, 2010.

7. Mohan Jag, "Organic Analytical Chemistry theory and Practice", Narosa Publication, New Delhi, 2003. 5. J Leonard, B Lygo, G Procter, "Advanced Practical Organic Chemistry", Stanley Thornes (Publishers) Ltd., First Indian Edition, 2004.