CHE-102-P: Chemistry Practical -I

Course type: Major (Practical) **No. of Credits: 2**

Course Outcomes

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

CO-1: acquire basic knowledge of experiments of including adsorption, organic qualitative analysis, and inorganic preparations and estimations.

CO-2: utilize theoretical concepts to perform experiments, interpret data, and formulate conclusions.

CO-3: foster critical thinking abilities to assess and enhance the reliability and accuracy of experimental findings.

CO-4: report scientific findings of laboratory experiments.

CO-5: evaluate experimental outcomes to draw insightful conclusions.

CO-6: develop problem-solving skills.

Course Content

Set I: Physical and Analytical Chemistry (Any four)

1. To Investigate the Adsorption of acetic acid by activated charcoal and verify Freundlich adsorption isotherm.
2. Investigate the adsorption of oxalic acid by activated charcoal and verify Langmuir adsorption isotherm.
3. Estimation of aspirin from given tablet and find error in qualitative analysis.
4. Balancing of chemical equation using titration data between Oxalic acid and $KMnO_4$
5. Determination of oxidation state and equivalent weight of magnesium and zinc metals by Eudiometric method.
6. Estimation of hardness of water by EDTA method

Set II: Organic Chemistry

A. Organic Qualitative Analysis (Any three)

1. Determination of physical constant, functional group and elements of the organic compound (acidic, basic, phenolic or neutral compound).

B. Preparation of Organic Derivative

1. Preparation of semicarbazone derivative of aldehyde and ketone and purity by TLC

Set III: Inorganic Chemistry

a. Inorganic Preparations (Any three)

2. Synthesis of potash alum from aluminium metal (scrap Aluminium metal) and qualitative test for anion and cation.
3. Synthesis of Mohr's Salt [$(FeSO_4)$ $(NH_4)_2SO_4]\bullet 6H_2O$ and qualitative test for anion and cation.
4. Synthesis of $FeSO_4\bullet 7H_2O$ and qualitative test for anion and cation.
5. Preparation of Dark red inorganic pigment: Cu_2O and qualitative test for cation.

b. Estimation of Purity of salt (Compulsory)

Determination of purity of any one of the synthesized salt by volumetric method.

For Self-Learning and Internal Evaluation:

1. Safety symbol on labels of pack of chemicals and its meaning
2. Precautions in handling of hazardous substances.
3. Toxicity of the compounds used in chemistry laboratory and classification of toxicity.
4. Preparation of solutions of different strengths (Percentage solutions, Molar, molal and normal solutions)

References:

1. Svehla, G. Vogel's Qualitative Inorganic Analysis, Pearson Education, 2012.
2. Mendham, J. Vogel's Quantitative Chemical Analysis, Pearson, 2009.
3. Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., Text book of Practical Organic Chemistry, Prentice-Hall, 5th edition, 1996.
4. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry Orient-Longman, 1960
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
6. R.K. Gupta and O.P. Gupta, Practical Chemistry.
7. Daniel C. Harris, Quantitative Chemical Analysis.
8. O.P. Tandon, Practical Chemistry.
9. N.K. Verma and S.C. Kheterpal, Comprehensive Practical Chemistry
10. K.C. Jain, Advanced Practical Chemistry.

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