

As Per New Syllabus (CBCS Pattern and NEP 1.0)

Shivaji University, Kolhapur

B.Sc. Part-III : Semester-V

ANALYTICAL CHEMISTRY

CHEMISTRY (DSE-E8) : PAPER-XII

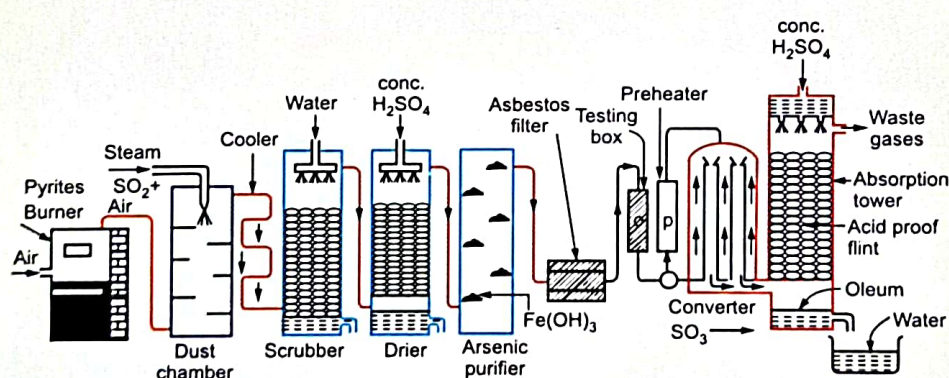
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Dr. AVINASH M. NALAWADE

Prof. (Dr.) REKHA A. NALAWADE

Prof. (Dr.) PRAVINA B. PISTE

Prof. (Dr.) ARJUN S. KUMBHAR



Manufacture of Sulphuric acid by Contact process

A TEXT BOOK OF
ANALYTICAL CHEMISTRY

(DSE-E8 : PAPER-XII)

FOR

B.Sc. Part III (NEP-1.0) Chemistry : Semester - V
New Changed CBCS Syllabus of Shivaji University,
Kolhapur w.e.f. June 2024 as per NEP-2020

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SYLLABUS

1. Potentiometric Titrations

[07]

- 1.1 Introduction.
- 1.2 Determination of pH.
- 1.3 Study of Quinhydrone and Glass electrodes and their use in determination of pH.
- 1.4 Potentiometric titrations: Classical and Analytical methods for locating end points.
- 1.5 Acids-Bases titration with suitable example.
- 1.6 Redox titration with suitable example.
- 1.7 Precipitation titration with suitable example.
- 1.8 Basic circuit of direct reading potentiometer.
- 1.9 Advantages of potentiometric titrations

2. Colorimetry and Spectrophotometry

[05]

- 2.1 Theory of colorimetry and spectrophotometry.
- 2.2 Lambert-Beer's law, Deviation from Beer's law.
- 2.3 Terms used in colorimetry and spectrophotometry.
- 2.4 Classification of methods of 'colour' measurement or comparison.
- 2.5 Photoelectric colorimeter method-Single beam photo-electric colorimeter.
- 2.6 Spectrophotometer method-Single beam direct reading spectrophotometer.
- 2.7 Determination of unknown concentration by using concentration-absorbance plot.
- 2.8 Applications of colorimetry and spectrophotometry.

3. Sugar Industry

[05]

- 3.1 Introduction.
- 3.2 Manufacture of cane sugar in India: Extraction of juice, Clarification, Concentration, Crystallization, Centrifugation and other details of industrial process.
- 3.3 Byproducts of sugar industry.
- 3.4 Manufacture of Ethyl Alcohol from Molasses: by Fermentation.

4. Manufacture of Industrial Heavy Chemicals

[06]

- 4.1 Introduction
- 4.2 Manufacture of Ammonia (NH_3)
 - 4.2 (A) Physico-chemical principles.
 - 4.2 (B) Manufacture by Haber's process.
- 4.3 Manufacture of Sulphuric acid (H_2SO_4)
 - 4.3 (A) Physico-chemical principles.
 - 4.3 (B) Manufacture by Contact process.

- 4.4 Manufacture of Nitric acid (HNO_3)
 4.4 (A) Physico-chemical principles.
 4.4 (B) Manufacture by Ostwald's process (Ammonia oxidation process).

5. A. Gas Chromatography [07]

5.1 Introduction to Chromatography

5.2 Principle of GC

5.3 Instrumentation of GC

5.4 Applications of GC

5.5 Advantages and Disadvantages

B. Quality control: Concepts in Quality control

(i) Introduction and Concept of quality control

(ii) Quality control.

(iii) Quality assurance.

(iv) ISO series.

(v) Good laboratory practices.

C. IPR : Industrial design and patent

Reference Books:

1. Text Book of Quantitative Inorganic Analysis – A. I. Vogel.
2. Instrumental Methods of Chemical Analysis – Willard, Merit and Dean.
3. Instrumentals Methods of Chemical Analysis – Chatwāl and Anand.
4. Vogel's Textbook of Qualitative Inorganic Analysis – Bassett, Denny etc.
5. Fundamentals of Analytical Chemistry – Skoog and West.
6. Basic Concepts of Analytical Chemistry – S. M. Khopkar.
7. Text Book of Qualitative Chemical Analysis – Vogel.
8. Handbook of Quality Assurance for the Analytical Chemistry Laboratory.
 – James P. Dux, Van Nostrand Reinhold, New York 1986.
9. Instrumental Methods of Chemical Analysis – H. Kaur.
10. A Text Book of Quantitative Chemical Analysis Vogel's by J. Mendham, R. C. Denney.
11. Quantitative Chemical Analysis – Daniel C. Harris.
12. Applying ISO 9000 Quality Management System, International trade centre publishing genera, Indian Edition printed by D. L. Shaha Trust.
13. Industrial Chemistry - B. K. Sharma.
14. Chemical Process Industries – Shrieve & Brink.
15. Industrial Chemistry – Kent.
16. Industrial Chemistry – Rogers.
17. Industrial Chemistry – R. K. Das.

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