



**ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) , VISAKHAPATNAM**

**VI SEMESTER**

**CHEMISTRY**

**TIME: 4 Hrs/Week**

**CH B36251(2)  
100**

**SYNTHESIS OF ORGANIC COMPOUNDS**

**Max. Marks :**

**w. e .f 2017-2018'AC' batch PRACTICAL SYLLABUS**

**OBJECTIVE:** To enable the students to apply the principles of organic synthesis for the synthesis of organic compounds with emphasis on yield

1. Preparation of Aspirin
2. Preparation of Acetanilide
3. Preparation of Paracetamol
4. Preparation of Barbutiric Acid
5. Preparation of Phenyl azo  $\beta$  - Naphthol
6. Preparation of S – Benzyl iso thio uronium chloride.

**REFERENCES :**

1. Practical Organic Chemistry – G Mann & B.C.Saunders ELBS & Long man Group Ltd – IV Edition.
2. Vogels's T.B. of Practical Organic Chemistry B S Furnis A J Hannaford, PWG Smith & AR Tatchell – ELBS V Edition.

**Cluster Elective – PAPER – VIII-B-2**

**ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM**

**VI SEMESTER**

**CHEMISTRY**

**Time: 3 Hrs/ Week**

**CH B26202 (3) INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE Max.Marks: 60**

**w.e.f 2017-2018 ('15AC' Batch) SYLLABUS**

**OBJECTIVES:** To enable the students to –

- Acquire knowledge about s-block and p-block elements, properties and their structures.
- Gain knowledge on industrially important materials and their manufacturing methods with special properties.
- To acquire knowledge of various types of surface coatings and alloys and their importance

**UNIT - I**

**1. Recapitulation of s- and p-Block Elements**

Periodicity in s- and p-block elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy, electronegativity (Pauling, Mulliken, and Alfred – Rochow scales). Allotropy in C, S, and P. Oxidation states with reference to elements in unusual and rare oxidation states like carbides and nitrides), inert pair effect, diagonal relationship and anomalous behaviour of first member of each group.

**2. Silicate Industries**

**Glass:** Glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass.

**Ceramics:** Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications, superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre.

**UNIT – II**

**3. Cements:** Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cements.

**Fertilizers:** Different types of fertilizers. Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.

**4. Surface Coatings:** Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings. Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings (electrolytic and electroless), metal spraying and anodizing.

**UNIT – III**

**5. Alloys:** Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon decarbonization, demanganization,

desulphurization dephosphorisation) and surface treatment (argon treatment, heat treatment, nitriding, carburizing). Composition and properties of different types of steels.

**6. Chemical explosives:** Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.

**Reference Books:**

1. E. Stocchi: *Industrial Chemistry*, Vol-I, Ellis Horwood Ltd. UK.
2. R. M. Felder, R. W. Rousseau: *Elementary Principles of Chemical Processes*, Wiley Publishers, New Delhi.
3. W. D. Kingery, H. K. Bowen, D. R. Uhlmann: *Introduction to Ceramics*, Wiley Publishers, New Delhi.
4. J. A. Kent: *Riegel's Handbook of Industrial Chemistry*, CBS Publishers, New Delhi.
5. P. C. Jain & M. Jain: *Engineering Chemistry*, Dhanpat Rai & Sons, Delhi.
6. R. Gopalan, D. Venkappayya, S. Nagarajan: *Engineering Chemistry*, Vikas Publications, New Delhi.
7. B. K. Sharma: *Engineering Chemistry*, Goel Publishing House, Meerut

**ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM**

**VI SEMESTER**

**CHEMISTRY**

**TIME: 3Hrs/week**

**CH B26252(1)**

**REACTIONS WITH GREEN PROCEDURES**

**Max. Marks: 50**

**w. e .f 2017-2018'AC' batch PRACTICAL SYLLABUS**

**OBJECTIVE:** To enable the students to apply the principles of green chemistry for the analysis and synthesis of organic compounds with emphasis on yield

- 1.Green procedure for organic qualitative analysis: Detection of N, S and halogens
- 2.Acetylation of 1<sup>o</sup> amine by green method: Preparation of acetanilide
3. Rearrangement reaction in green conditions: Benzil-Benzilic acid rearrangement
4. Electrophilic aromatic substitution reaction: Nitration of phenol
5. Radical coupling reaction: Preparation of 1,1-bis -2-naphthol
6. Green oxidation reaction: Synthesis of adipic acid
7. Green procedure for Diels Alder reaction between furan and maleic anhydride

**REFERENCES :**

1. Green Chemistry Theory and Practice. P Anatas and J C Warner. Oxford Science Publications, 1998.
2. Monograph on Green Chemistry Laboratory Experiments. Green Chemistry Task Force Committee, DST,

**Cluster Elective – PAPER – VIII-B-3**

**ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM**

**VI SEMESTER**

**CHEMISTRY**

**Time: 3 Hrs/ Week**

**CH B36203 (3) ANALYSIS OF APPLIED INDUSTRIAL PRODUCTS Max.Marks: 60**

**w.e.f 2017-2018 ('15AC' Batch) SYLLABUS**

**OBJECTIVES:** To enable the students to gain knowledge

1. By understanding the Analysis of soaps, paints, oils, Fertilizers etc.
2. About the analysis of Glass, Gas and Cement

**UNIT- I**

1. Analysis of soaps: moisture and volatile matter, combined alkali, total fatty matter, free alkali, total fatty acid, sodium silicate and chlorides. Analysis of paints : Vehicle and pigments, Barium Sulphate, total lead, lead chromate, iron pigments, zinc chromate

2. Analysis of oils: saponification value, iodine value, acid value, ester value, bromine value, acetyl value. Analysis of industrial solvents like benzene, acetone, methanol and acetic acid., Determination of methoxyl and N-methyl groups.

**UNIT-II**

3. Analysis of fertilizers: urea, NPK fertilizer, super phosphate, Analysis of DDT, BHC, endrin, endosulfone, malathion, parathion. Analysis of starch, sugars, cellulose and paper.

4. Gas analysis: carbon dioxide, carbon monoxide, oxygen, hydrogen, saturated hydro carbon, unsaturated hydrocarbons, nitrogen, octane number, cetane number. Analysis of Fuel gases like: water gas, producer gas, kerosene (oil) gas. Ultimate analysis : carbon, hydrogen, nitrogen, oxygen, phosphorus and sulfur.

**UNIT - III**

**5. Analysis of cement-** loss on ignition, insoluble residue, total silica, sesquioxides, lime, magnesia, ferric oxide, sulphuric anhydride.

**6. Analysis of glasses -** Determination of silica, sulphur, barium, arsenic, antimony, total  $R_2O_3$ , calcium, magnesium, total alkalies, aluminium, chloride, fluoride

**SUGGESTED BOOKS:**

1. F.J. Welcher- Standard methods of analysis,
2. A.I. Vogel- A text book of quantitative Inorganic analysis- ELBS,
3. H.H. Willard and H. Deal- Advanced quantitative analysis- Van Nostrand Co,
4. F.D. Snell & F.M. Biffen- Commercial methods of analysis- D.B. Tarapuravala & sons,
5. J.J. Elving and I.M. Kolthoff- Chemical analysis - A series of monographs on analytical chemistry and its applications -- Inter Science- Vol I to VII.,
6. G.Z. Weig - Analytical methods for pesticides, plant growth regulators and food additives - Vols I to VII,
7. Analytical Agricultural Chemistry by S.L. Chopra & J.S. Kanwar-- Kalyani Publishers
8. Manual of soil, plant, water and fertilizer analysis, R.M. Upadhyay and N.L. Sharma, Kalyani Publishers.

**ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM**

**VI SEMESTER**

**CHEMISTRY**

**TIME: 3Hrs/week**

**CHB36253(1)**

**WATER ANALYSIS**

**Max. Marks: 50**

**w. e .f 2017-2018'AC' batch PRACTICAL SYLLABUS**

**OBJECTIVE:** To enable the students to examine water quality through quantitative estimation of selected water quality parameters

1. Determination of carbonate and bicarbonate in water samples (acidity and alkalinity)
2. Determination of hardness of water using EDTA
  - a) Permanent hardness
  - b) Temporary hardness
3. Determination of Acidity
4. Determination of Alkalinity
5. Determination of chlorides in water samples

**REFERENCES :**

1. Vogel's T.B. of Quantitative Inorganic Analysis – J. Beseth R.C.Denney, GH Jeffery & J.Mendham. ELBS – IV Edition.
2. Standard Methods for the Examination of Water and Waste Water, 19th Edition, APHA, AWWA, WEF 1995.