

COURSE-X I BSCCH 302 ORGANIC CHEMISTRY- III

Block-1 Spectroscopy and Organometallic Compounds

Unit-1 NMR Spectroscopy

1.1 Objectives

1.2 Introduction

1.3 Proton magnetic resonance (^1H NMR) spectroscopy

1.4 Nuclear shielding and deshielding

1.5 Chemical shift and molecular structure

1.6 Spin-spin splitting and coupling constants

1.7 Areas of signals

1.8 Interpretation of PMR spectra of simple organic molecules

1.9 Ethyl bromide, ethanol, acetaldehyde, 1, 1, 2-tribromoethane, ethyl acetate, toluene and acetophenone.

1.10 Problems pertaining to the structure elucidation of simple organic compounds using UV, IR and PMR spectroscopic techniques.

8.1 Summary

8.2 Terminal Question

1.11 Answers

Unit-2 Organometallic Compounds

2.1 Objectives

2.2 Introduction

2.3 Organomagnesium compounds

2.4 Grignard reagents

2.4.1 Formation

2.4.2 Structure and chemical reactions

2.5 Organozinc compounds

2.5.1 Formation, Structure

2.5.2 Chemical reaction

2.6 Summary

2.7 Terminal Question

2.8 Answers

Unit-3 Organosulphur Compounds

3.1 Objectives

3.2 Introduction

3.3 Nomenclature

3.4 Structural features

3.5 Methods of formation

3.6 Chemical reactions of thiols, thioethers, sulphuric acid, sulphonamides and sulphguanidine

3.7 Summary

3.8 Terminal Question

3.9 Answers

Block -2 Heterocyclic

Unit -4 Heterocyclic Compounds I

4.1 Objectives

4.2 Introduction

4.3 Molecular orbital picture

4.4 Aromatic characteristics of pyrrole, furan, thiophene and phridine, methods of

4.5 Synthesis and chemical reactions with particular emphasis on the mechanism

4.6 Electrophilic substitution reaction in pyridine derivatives

4.7 Comparison of basicity of pyridine, piperidine and pyrrole

4.8 Summary

4.9 Terminal Question

4.10 Answers

Unit -5 Heterocyclic compounds II

5.1 Objectives

5.2 Introduction

5.3 Introduction to condensed five and six numbered heterocycles

5.4 Preparation and reactions of quinoline and isoquinoline with special reference to

5.4.1 Fisher indol synthesis

5.4.2 Skraup synthesis

5.4.3 Bischer Napieralski synthesis

5.5 Mechanism of electrophilic substitution reaction of quinoline and isoquinoline

5.6 Summary

5.7 Terminal Question

5.8 Answers

Block -2 Biomolecules-I

Unit -6 Amino acids, Peptides, Proteins

6.1 Objectives

6.2 Introduction

6.3 Classification

6.4 Structure and stereochemistry of amino acids

6.5 Acid base behavior

6.6 Isoelectric point and electrophoresis

6.7 Structure and nomenclature determination

6.8 End group analysis

6.9 Selective hydrolysis of peptides and proteins.

6.10 Level of protein structure

6.11 Protein denaturation.

6.12 Enzymes, Coenzymes, Cofactors and Vitamins.

6.13 Summary

6.14 Terminal Question

6.15 Answers

Unit -7 Carbohydrates

7.1 Objectives

7.2 Introduction

7.3 Classification and nomenclature

7.4 Monosaccharides

7.5 Mechanism of osazone formation

7.6 Interconversion of glucose and fructose

7.7 Chain lengthening and chain shortening of aldose

7.8 Configuration of monosaccharides

7.9 Erythro and threo diastereomers conversion of glucose

- 7.10 Ethers and esters
- 7.11 Determination of ring size of monosaccharides
- 7.12 Cyclic structure of D (+) glucose.
- 7.13 Mechanism of mutarotation
- 7.14 General study of disaccharides
- 7.15 General introduction of structure of ribose and deoxyribose
- 6.16 Summary
- 6.17 Terminal Question
- 6.18 Answers

Unit -8 Lipids

- 8.1 Objectives
- 8.2 Introduction
- 8.3 Classification
- 8.4 Types of Lipids
- 8.5 Important Structural features
- 8.6 Industrial features
- 8.7 Summary
- 8.8 Terminal Question
- 8.9 Answers

Block-3 Biomolecules-II

Unit-9 Nucleic acids and Fats

- 9.1 Objectives
- 9.2 Introduction
- 9.3 Nucleic acids
- 9.4 Introduction.
- 9.5 Constituents of nucleic acids
- 9.6 Ribonucleosides a Ribonucleotides
- 9.7 The double helical structure of DNA
- 9.8 Genetic code.
- 9.9 Natural fats and common fatty acids
- 9.10 Glycerides

9.11 Hydrogenation of unsaturated oils

9.12 Saponification value

9.13 Iodine value and acid value

9.14 Soap, synthetic detergents

9.15 Alkyl and aryl sulphonates

9.16 Summary

9.17 Terminal Question

9.18 Answers

Unit-10 Fats Oils and Detergents

10.1 Objectives

10.2 Introduction

10.3 Natural fates and common fatty acids

10.4 glycerides, hydrogenation of unsaturated oils

10.5 Saponification value

10.6 Iodine value and acid value

10.7 Soap, synthetic detergents, alkali and aryl sulphonate

10.8 Summary

10.9 Terminal Question

10.10 Answers

Unit-11 Synthesis Dyes

11.1 Objectives

11.2 Introduction

11.3 Colour and constitution (electronic concept)

11.4 Classification of dyes

11.5 Synthesis and use of Methyl orange

11.6 Malachite green

11.7 Phenolphthalein Fluorescein

11.8 Alizarin and Indigo

11.9 Summary

11.10 Terminal Question

11.11 Answers

Unit-12 Natural Products

12.1 Objectives

12.2 Introduction

12.3 Classification

12.4 Extraction and general methods of structure determination of terpenoids

12.4.1 Limonene,

12.4.2 Citral

12.4.3 Alkaloids

12.4.4 Nicotin

12.4.5 Cocaine.

12.5 Summary

12.6 Terminal Question

12.7 Answers