

**SRI MEENAKSHI GOVERNMENT ARTS COLLEGE FOR WOMEN(A),
MADURAI -2**

DEPARTMENT OF CHEMISTRY

**PG CHEMISTRY BOARD OF STUDIES – 2021 – 2022
CONDUCTED ON 5.5.2021
RESOLUTIONS**

1. In Semester II, elective paper,EDB1

MOLECULAR SPECTROSCOPY & ANALYTICAL CHEMISTRY II, the contents are clearly expanded as follows.

i) Unit III - MOSSBAUER PHOTOELECTRON SPECTROSCOPY is modified as follows. Photoelectron Spectroscopy (PES): Principles of UV -PES and XPS. Auger electrons in XPS. Applications of UV -PES and XPS.

ii) UNIT IV- THERMOANALYTICAL & SPECTROANALYTICAL TECHNIQUES is modified as follows

Thermoanalytical techniques: Principle, Instrumentation (Block diagram only) and applications of TGA, Principles and applications of DTA and DSC - Factors affecting TGA and DTA curves. Spectrochemical techniques : Atomic absorption spectrometry, Flame photometry - Atomic emission spectrometry.

iii) Unit V - POLARIMETRY is modified as follows. Optical rotatory dispersion, circular dichroism, Cotton effect, Dispersion curves - Recognition and location of a carbonyl group in an asymmetric environment - The octant rule and the haloketone rule.

2. In Semester III, in core paper, DCI - INORGANIC CHEMISTRY III,
The contents are clearly expanded and some new contents are included.

In unit I POLYACIDS AND INORGANIC POLYMERS . modification is done as follows. Poly acids: Isopoly acids and heteropolyacids of Vanadium, Chromium, Molybdenum and Tungsten. Keggin, Well-Dawson structure is included.

ii) in UNIT II - HYDRIDES AND METAL CLUSTERS, for polyhedralboranes, specific examples are included. In metallocarboranes, the following are included.

metallocarboranes - synthetic strategy polyhedral expansion and contraction, intergrowth, thermal metal transfer, Wades rule.

(iii) in metal clusters the following are included.

Metal clusters: Chemistry and molecularity of dinuclear and trinuclear metal clusters, metal-metal multiple bonds (quartet and quintet bonds with examples).

3. In III Semester, ELECTIVE 3, EDC1 course paper the title of the paper has been changed as NANOCHEMISTRY. The following changes have been made in the content. The content of the syllabus has been spelt out clearly and expanded as follows.

UNIT - I

INTRODUCTION TO NANOMATERIALS

Definition - Natural nanomaterials- Classification of nanomaterials (Based on dimension and materials)-Surface area to volume ratio.

Carbon based nanomaterials - Fullerenes - type Symmetry, Structure, Synthesis (Laser ablation, Electric arc discharge method) - applications.

Carbon nanotubes - types - difference between single walled CNTs and multi walled CNTs - Properties (Mechanical strength, electrical conductivity, Thermal stability)- Synthesis (Laser ablation, CVD) - applications.

UNIT - II

SYNTHESIS OF NANOMATERIALS

Top down and Bottom up approach- Top down approach (arc discharge, ball milling and inert gas condensation) - bottom up approach (Laser ablation, chemical vapour deposition, sol gel method, hydrothermal synthesis)

UNIT - III

PROPERTIES OF NANOMATERIALS

Introduction, Mechanical properties of nanomaterials: Elastic properties, Hardness and Strength, Ductility and toughness, Superplastic behavior

Optical Properties; Surface Plasmon resonance and quantum size effects, Applications of optical properties of nanoparticles

Electrical properties - Energy band structure of Nano and bulk materials.

Magnetic properties - Introduction - Effect of Temperature on magnetic susceptibility - Classification of magnetic properties of nanomaterials (Structure sensitive and structure insensitive) - Superparamagnetism.

UNIT - IV

CHARACTERIZATION OF NANOMATERIALS

Spectroscopic Techniques - Interpreting UV-Visible data of gold nanoparticles

X-ray Crystallography – Basic idea of Powder X-ray diffraction method - Determination of crystalline size using Scherrer's formula - Determination of crystalline size distribution using X-ray line shape analysis –

X-ray diffraction patterns of commercially important CuO and ZnO

Electron microscopic techniques – EDX : Basic principle and its importance – SEM; Basic principle and its importance TEM; Basic principle and its importance

UNIT –V

APPLICATIONS OF NANOMATERIALS

(General applications only not specific)

Applications of nano materials in various fields - Medicine, Food, Agriculture, catalysis, water purification and environment

4. In IV Semester, Core Paper DD1 course paper ORGANIC CHEMISTRY IV,

in UNIT I, - PHOTOCHEMISTRY,

in photochemistry of Carbonyl compounds, photooxidation reactions are included.

in photochemistry of olefins,

photodimerization, di - Π methane rearrangement are included.

in photorearrangement of cyclohexadienones, Zimmerman mechanism only and photochemistry of natural product, α - santonin are included.

ii) UNIT II, - PERICYCLIC REACTIONS, is expanded clearly as follows:

Conservation of Molecular orbital Symmetry – Symmetry properties of Molecular orbitals [(1,3-butadiene, 1,3,5-hexatriene molecule)], Electrocyclic reactions- Correlation diagram and FMO method [cyclobutene – 1,3-butadiene, cyclohexadiene and 1,3,5-hexatriene system] – Cyclo addition reactions – Correlation diagram and FMO method (2S + 2S, 4S+ 2S system) - Sigmatropic Rearrangement – Suprafacial and antarafacial processes- Analysis of [1,5] sigmatropic shift - Cope and Claisen rearrangement – Thermal isomerization ([1,3] and [3,3] sigmatropic shift) - Applications of PMO method to Pericyclic reactions (Electrocyclic reactions, Cyclo addition and Sigmatropic reactions).

iii) In UNIT III – STEROIDS AND HORMONES

in synthesis of ergocalciferol, (structural elucidation is not included) is included. Biosynthesis of lanosterol is included.

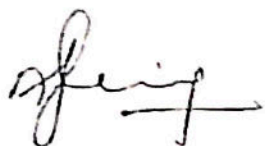
5. In Semester IV, Core Paper DD2 - SELECTED TOPICS IN CHEMISTRY,

In UNIT I - SOLID STATE CHEMISTRY AND X - RAY DIFFRACTION, modifications are done as follows:

Structure of complex ionic compounds - perovskite, spinel, olivine and fluorite related structures, imperfections in crystals - non-stoichiometric compounds, ionic solids conductivity, lattice energy, Kapustinski equation, application of lattice energy, covalent solids, intrinsic and photoexcited semiconductor.

6. In Semester IV, EDD1 - GREEN CHEMISTRY, in all the five units.

'mechanism is not included for all the reactions' as the main focus is to discuss the concepts of green chemistry.



Dr. A. Jeevika,
Assistant Professor (SF),
Department of Chemistry,
Thiagarajar College,
Madurai 625 009.