



SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution &
Accredited by NAAC with "A" Grade)

Madagadipet, Puducherry - 605 107



SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF CHEMISTRY

Minutes of V meeting of Board of Studies

Venue

Department of Chemistry, SAS Block
Sri Manakula Vinayagar Engineering College
Madagadipet, Puducherry - 605 107

Date & Time 10.09.2022 & 02.30 PM

2.E.6.1

2.E.6.2



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SCHOOL OF ARTS AND SCIENCE DEPARTMENT OF CHEMISTRY

Minutes of 5th Meeting of Board of Studies

The 5th meeting of Board of Studies for **B.Sc. Chemistry** was held on *10.09.2022 at 02.30 p.m.* in the Department of Chemistry, SAS Block, Sri Manakula Vinayagar Engineering College with the Head of the Department in the Chair and Internal members.

The following members were present for the BoS meeting

Sl. No	Name of the Members with Designation and official Address	Responsibility in the BS
1	Dr. S. Savithri , Professor and Head, Department of Chemistry, SAS Sri Manakula Vinayagar Engineering College, Puducherry.	Chairman
External Members		
2	Dr. K. Velavan Associate professor, NIT, Goa.	University Nominee
3	Dr. V. Nandha Kumar Associate Professor, AVVM Sri Pushpam College (Autonomous), Poondi, Thanjavur-DT.	Subject Expert
4	Dr. K. Ramesh Assistant Professor , Poompuhar College (Autonomous), Melaiyur, Nagapattinam - DT.	Subject Expert
5	Mr. R. Sevel Associate Director, Par Active Technologies (p)Ltd.,Chennai.	Industrial Expert
Internal Members		
6	Dr. A. Rajappa Associate Professor	Member
7	Dr. K. Karthikeyan Associate Professor	Member
8	Dr.E.Saropurani Assistant Professor	Member

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Co-opted Members		
10	Dr. T. Jayavarthanan Associate Professor /Physics	Member
11	Mr. R. Sivakumar Assistant Professor,/Mathematics	Member
12	Mrs. G. Namitha AssistantProfessor/ English	Member

AGENDA OF THE MEETING

Agenda	Description
BoS /U.G/ B.Sc Chemistry 5.1	Welcome Address, Introduction about the Institution, Department and BoS Members
5.2	Confirmation of minutes of the Fourth meeting of the Board of Studies.
5.3	To discuss and approve the improvisations in the Curriculum Structure of the Bachelor of Chemistry Programme (V & VI Semester)
5.4	To discuss and recommend <ul style="list-style-type: none"> ❖ Industrial Visit ❖ Project area of the third year students
5.5	To consider any other item with the permission of the Chair

MINUTES OF THE MEETING

Dr. S. Savithri, Chairman, BoS formally initiated the meeting by welcoming the board members and greeted them for accepting the invitation for the 5th BOS meeting. The Chairman presented the agenda as tabulated above

Item No :5.2	<p>Confirmation of minutes of the Fourth meeting of the Board of Studies held on 16.02.2022.</p> <p>The 4th meeting of BoS for B.Sc. Chemistry, under regulation 2020 w a s held on 16.02.2022.</p> <p>The Chairman, BOS appraised the minutes of fourth BOS, its implementation and then it is confirmed with the approval in fourth BOS meeting for the incorporation of minor revisions needed as mentioned below</p>
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S. No	Regulation	Sem.	Course code	Modern Indian Language	Particulars
1	R2020	III	A20CHT308	Organic Chemistry- I	In the V Semester Organic Chemistry- III course (A20CHT514), Unit V is entitled as Aromatic Aldehydes and ketones. As a result, BOS members proposed changing the title of Organic Chemistry - I Unit V from "Aldehydes and Ketones" to "Aliphatic Aldehydes and Ketones" for the III semester.
2	R2020	VI	A20CHT618	Inorganic Chemistry And Computer Applications	Suggested to replace the units IV and V Unit IV "Introduction of computers" has been replaced by "Co-ordination Chemistry I" Unit V "Programming in 'C' language" has been replaced by "Co-ordination Chemistry II". In this regard, course has been renamed as Inorganic Chemistry -IV

Minutes are Reviewed and Confirmed

Item No:5.3	<p>To discuss and approve the improvisations in the Curriculum Structure of the Bachelor of Chemistry Programme (V & VI Semester)</p> <p>The BoS members elaborately discussed the curriculum and syllabi of V and VI semesters and suggested the following modifications</p>
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S.No	Regulation	Semester	Subject Name with Code	Unit	Particulars
1	R-2020	V	Physical Chemistry –III A20CHT515	1	The expert members suggested to replace Nanotechnology as Spectroscopy – I
				2	Spectroscopy – II is introduced as unit 2
				3	The existing unit 2 Phase Rule becomes unit 3
				4	The existing unit 3 Chemical Kinetics is shifted to unit 4
				5	The existing 4 & 5 units are merged with the title "Quantum Chemistry" and given as unit 5 (Annexure 1)
			Inorganic Chemistry – III (A20CHT513)	1 & 4	BOS members suggested to simplify the Unit – 1 & 4 (Annexure 13)
2	R-2020	IV	DSE –II A20CHE4XX	-	The Course titled Applied Chemistry has to be renamed as Applied Chemistry I (Annexure 2)
3	R-2020	V	DSE-III A20CHE5XX	-	Instead of Spectroscopy – I the course title has been replaced as Applied Chemistry II with relevant syllabus. (Annexure 3) BOS members also suggested to simplify Pharmaceutical Chemistry syllabus. (Annexure 4)

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					In DSE – III as per the curriculum 3 hours have been allotted as lecture hours and 1 hour as tutorial hour The BOS members suggested to allot 4 hours as lecture hours. (Annexure 5)
4	R-2020	V	Gravimetric Analysis and Preparation of Organic Compounds (practical) A20CHL516	-	We have assigned 3 credits for Gravimetric analysis. As it is a practical course our BOS members suggested to change the credits from 3 to 2 (Annexure 5)
5	R-2020	V	Physical Chemistry practicals A20CHL517	-	Physical Chemistry (non-electrical) in V sem and Physical Chemistry (electrical) in VI sem are combined and placed in VI semester as Physical Chemistry practical as per the suggestion given by BOS members. We have assigned 3 credits for Practicals. As it is a practical course our BOS members suggested to change the credits from 3 to 2 credits. (Annexure 6)
6	R-2020	V	Industrial Chemistry practicals A20CHL517	-	The expert suggested to introduce Industrial Chemistry practicals in V semester. We have assigned 3 credits for Practicals. as it is a practical course our BOS members suggested to change the credits from 3 to 2 (Annexure 7)
7	R-2020	V	Personality Development A20CHS505	-	4 hours was allotted for this practical course, the BOS members suggested to convert the practical hours into lecture hours (Annexure 5)
8	R-2020	V & VI	Employability Enhancement Course		We have Gaussian software in V semester and Autodock Software in VI semester. For the benefit of the students, BOS members recommended to have placement training in Employability Enhancement Course. (Annexure 5 & 8)
9	R-2020	VI	Organic Chemistry IV A20CHT619	III	The BOS members suggested to change the title of unit 3 Photochemistry as Organic Photochemistry, and also suggested to remove the topic Jablonski diagram from unit, besides rearranging the other topics. (Annexure 9)
				V	Suggested to remove the existing unit V (Green Chemistry) and include Mass Spectroscopy as unit V. (Annexure 9)

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10	R-2020	VI	Physical Chemistry IV A20CHT620	III	Suggested to change the title of the unit III Photochemistry as "Physical Photochemistry and Group Theory" and also suggested to include few topics in Group Theory. (Annexure 10)
12	R-2020	VI	DSE-IV A20CHE6XX		Instead of Spectroscopy – II the course title has been replaced as Medicinal Chemistry with relevant syllabus. (Annexure 11) Members also suggested to simplify the Agricultural chemistry syllabus (Annexure 12) In DSE – IV, as per the curriculum 3 hours have been allotted as lecture hour. BOS members suggested to give 4 hours as lecture hrs. (Annexure 8)
13	R-2020	VI	Core Based Project A20CHP622		In Core Based Project as per the curriculum 12 practical hours have been allotted with 6 credits the BOS members suggested to replace it with 10 hours and 5 credits. (Annexure 8)

Item No :5.4	<p>To discuss and recommend *Industrial Visit area and Project area</p> <ul style="list-style-type: none"> • Two industry trips per semester are proposed by the members of the BoS. They suggested to take the students to food and preservation industries, pharmaceutical industries, vermicomposting industries, and textile industries • The members of the BoS reviewed and recommended the following topics for completing the Innovative project <ul style="list-style-type: none"> * Students with computer knowledge can conduct computer-based projects * Water / soil Analysis * Crystal study * Working model Preparation
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Item No :5.5	<p>Any other item with the permission of chair</p> <p>The BOS members suggested that all the students have to register for NPTEL course</p>
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The Board of Studies approved and recommended the above resolutions for B.Sc. Chemistry, to be presented in the academic council for further approval.

Dr. S. Savithri, Head of the Department, Chemistry thanked all the members for their kind cooperation and the meeting concluded at 04.45 p.m.



Dr. S. Savithri
Chairman/BOS

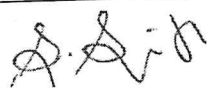
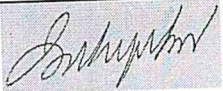

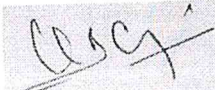
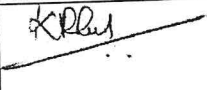

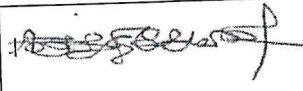


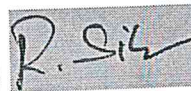
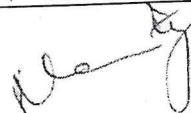

Dr. S. Muthulakshmi
 Dean SAS
 (Dr. S. Muthulakshmi)
 Dean
 School of Arts and Science
 Sri Manakula Vinayagar Engineering College
 [An Autonomous Institution]
 Puducherry -605107

Handwritten scribble

Dr. S. Mutulakshmi
Dean
School of Arts and Science
St. Mary's College
[An Autonomous Institution]
Puducherry-605007

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The minutes of the Fifth Meeting of the Board of Studies (B.Sc Chemistry) held on 10.09.2022 is signed by the following members who attended the meeting:

Sl. No	Name of the Members with Designation and official Address	Responsibility in the BoS	Signature
1	Dr. S. Savithri Professor and Head, Department of Chemistry, SAS Sri Manakula Vinayagar Engineering College, Puducherry.	Chairman	
External Members			
2	Dr. K. Velavan Associate professor, NIT, Goa.	University Nominee	
3	Dr. V. Nandha Kumar Associate Professor, AVVM Sri Pushpam College (Autonomous), Poondi, Thanjavur-DT.	Subject Expert	
4	Dr. K. Ramesh Assistant Professor, Poompuhar College (Autonomous), Melaiyur, Nagapattinam-DT.	Subject Expert	
5	Mr. R. Sevel Associate Director, Par Active Technologies(p) Ltd., Chennai.	Industrial Expert	
Internal Members			
6	Dr. A. Rajappa Associate Professor	Member	
7	Dr. K. Karthikeyan Associate Professor	Member	
8	Dr. E. Saropurani Assistant Professor	Member	
Co-opted Members			
10	Dr. T. Jayavarthanam Associate Professor / Physics	Member	
11	Mr. R. Sivakumar Assistant Professor / Maths	Member	
12	Mrs. G. Namitha Assistant Professor / English	Member	

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Annexure – 1

A20CHT515

PHYSICAL CHEMISTRY -III

L	T	P	C	Hrs
4	0	0	4	60

Course Objectives

- To study the basic concept in the spectroscopy.
- To know the principles and applications of Raman, IR, UV- Visible, and NMR Spectroscopy
- To study the basic terms used phase rule and applications.
- To understand the chemical kinetics and applications,
- To know the Postulates of quantum mechanics, Schrödinger wave equation and significance.

Course Outcomes

After the completion of this course, the students will be able to

CO1- Understand the basic concepts in the spectroscopy

CO2- Apply the concepts of Raman, IR, UV- Visible, and NMR Spectroscopy the various problem.

CO3- Study the concepts of phase rule and applications.

CO4- Understand rate , order, types of order, Arrhenius theory.

CO5- Make use of the applications of quantum chemistry

UNIT I SPECTROSCOPY - I**(12 Hrs)**

Spectroscopy – definition– the regions of various types of spectra. Microwave spectroscopy - Rotational spectra of a rigid diatomic molecule – Condition for a molecule to be active in Microwave region – rotation constant (β) and selection rule for rotational transition. Infrared Spectroscopy - Vibrations of diatomic molecules –Harmonic oscillator- Zero point energy, Force constant and Dissociation energy – Condition for a molecule to be active in the IR region – Selection rules for vibration transition – Fundamental bands and overtones.

UNIT II SPECTROSCOPY - II**(12 Hrs)**

Raman Spectroscopy - Rayleigh scattering and Raman Scattering - Stokes and Anti-stokes lines in Raman Spectra –Condition for a molecule to be Raman active– Comparison of Raman and IR Spectra – Rule of Mutual Exclusion. UV- Visible spectroscopy-conditions- Franck-Condon principle – types of electronic transitions. NMR Spectroscopy - Theory of NMR Spectra – Nuclear spin and conditions for a molecule to give rise to NMR spectrum–chemical shift - – Reasons for using TMS as a Reference- Theory of Spin – Spin coupling – splitting of NMR signals – NMR spectrum of pure and acidified Ethanol.

UNIT III PHASE RULE**(12 Hrs)**

Phase rule – Definition of terms – Phase rule – Derivation – Applications – One component systems - H₂O and sulphur systems – super cooling, sublimation – Two component systems – simple eutectic (Pb-Ag) - desilverisation of lead – compound formation with congruent melting point (Mg - Zn) – incongruent melting point (Na-K) – solid solutions (Ag-Au system) - Fractional crystallization – Freezing mixtures

UNIT IV CHEMICAL KINETICS**(12 Hrs)**

Rate constant, order and molecularity – Integrated rate expression - I order, II order (reactants same and different) and zero order reaction – derivation, Half-life period - zero, I, II order reactions, methods

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of determining order of the reaction-use of differential rate expression-use of integral rate expression-half-life method- isolation method, Arrhenius equation – significance of energy of activation.

UNIT V QUANTUM CHEMISTRY

(12 Hrs)

Postulates of quantum mechanics, derivation of Schrödinger wave equation, wave function and its significance, probability of finding electrons, operators - differential and integral operators only, application of Schrödinger wave equation - particle in one dimensional box. Black body radiation-Quantum theory of radiation – Planck's theory (No derivation required), Derivation of Ritz combination principle, Photoelectric effect-Einstein photoelectric equation, Compton Effect.

Text Books

- 1.B.R.Puri,L.R. Sharma and M.S.Pathania, "Principles of Physical chemistry", Vishal publication, Jalandhar-Delhi, India, 30thEdition, 2007.
- 2.R.Gopalan, P.S Subramanian, K.Rengarajan, "Elements of Analytical Chemistry" S.Chand and sons 6th Edition.
3. Glasstone S. A., "Text book of Physical Chemistry", McMillan India Ltd., 1st Edition, 1999.

Reference Books

- 1.K.J.Laidler, "Chemical Kinetics", TaTa Mc Graw – Hill, UK,2nd Edition, 2005.
- 2.Chandra A.K."Introductory quantum chemistry", TaTa McGraw – Hill publishing company limited, UK,4th Edition,1994.
- 3.D.A Skoog and Saunders, "Principles of Instrumental Methods of Analysis", College Publications, 3rd Edition, 1985.

Web References

- 1.https://chem.libretexts.org/Courses/Mount_Royal_University/Chem_1201/Unit_1%3A_Quantum_Chemistry
2. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SCY1612.pdf
3. https://en.wikipedia.org/wiki/Chemical_kinetics

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Annexure – 2

DISCIPLINE SPECIFIC COURSES

Discipline Specific Elective – I (Offered in Semester III)		
Sl. No.	Course Code	Course Title
1	A20CHE301	Food and Preservation Chemistry
2	A20CHE302	Nano and Green Chemistry
3	A20CHE303	Polymer Chemistry
Discipline Specific Elective – II (Offered in Semester IV)		
Sl. No.	Course Code	Course Title
1	A20CHE404	Industrial Chemistry
2	A20CHE405	Group Theory and Spectroscopy
3	A20CHE406	Applied Chemistry - I
Discipline Specific Elective – III (Offered in Semester V)		
Sl. No.	Course Code	Course Title
1	A20CHE507	Applied Chemistry - II
2	A20CHE508	Pharmaceutical Chemistry
3	A20CHE509	Molecular Modeling and Drug Designing
Discipline Specific Elective – IV (Offered in Semester VI)		
Sl. No.	Course Code	Course Title
1	A20CHE610	Medicinal Chemistry
2	A20CHE611	Agricultural Chemistry
3	A20CHE612	Computer Aided Chemistry

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Annexure - 3**A20CHE507****APPLIED CHEMISTRY - II**

L	T	P	C	Hrs
4	0	0	4	60

Course Objectives

- To study the basic concept of water treatment.
- To study the basic terms used in the energy resources and corrosion.
- To understand the industrial polymers and polymer processing,
- To know the pollution control concepts.
- To know the principles and applications of nanomaterials

Course Outcomes

After the completion of this course, the students will be able to

- CO1-** Understand the basic concepts of hardness of water and water treatment
CO2- Study the concepts of nuclear energy resources and corrosion
CO3- Apply industrial polymers and polymer processing
CO4- Use the various pollution control methods in pollution control
CO5- Apply the nanomaterial in the industrial applications

UNIT I WATER TREATMENT**(12 Hrs)**

Hardness of water – types – expression of hardness – units – estimation of hardness of water by EDTA – numerical problems – boiler troubles – scale, sludge, priming, foaming, caustic embrittlement and boiler corrosion— treatment of boiler feed water – Internal treatment (phosphate, colloidal, sodium aluminate and calgon conditioning) - external treatment – Ion exchange process, zeolite process – desalination of brackish water - Reverse Osmosis.

UNIT II ENERGY SOURCES AND CORROSION**(12 Hrs)**

nuclear energy - Nuclear fission, nuclear fusion - differences between nuclear fission and fusion - nuclear chain reactions - light water nuclear power plant - breeder reactor. Corrosion- causes- factors- types- chemical, electrochemical corrosion (galvanic, differential aeration), corrosion control – Cathodic protection (sacrificial anode method and impressed current cathodic method). Inhibitors

UNIT III INDUSTRIAL POLYMERS AND POLYMER PROCESSING TECHNIQUES**(12 Hrs)**

Industrial Polymers - Thermoplastics: Polyethylene, Teflon, Polyvinyl chloride, Polytetrafluoro ethylene, polyethylene and Nylon 6,6 (Synthesis and applications only). Thermosetting Plastics: Phenol formaldehyde and Bakelite. Elastomers: Natural rubber and synthetic rubber - Buna-N, Buna-S and Butyl Rubber (Synthesis and applications only). Vulcanisation of rubber. Conducting Polymers.

UNIT IV POLLUTION CONTROL**(12 Hrs)**

Water pollution control and monitoring – DO, COD, BOD & TOC. Basic concepts and instrumentation of UV spectroscopy, IR spectroscopy, Atomic Absorption Spectrometry, and Gas Chromatography. Analysis of air pollutants –CO_x, H₂S, Hydrocarbons and particulates. Causes, effect and control measures of Thermal and radioactive pollution.



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UNIT V NANOCHEMISTRY**(12 Hrs)**

Basics – distinction between molecules, nanoparticles and bulk materials; size-dependent properties. Nanoparticles; nano cluster, nano rod, Carbon nanotube(CNT) and nanowire. Synthesis of nano material; Top down process: laser ablation, chemical vapour deposition, electrodeposition. Bottom up process; precipitation, thermolysis, hydrothermal, solvothermal. Carbon nanotube – Synthesis and properties. Applications of nanomaterials.

Text Books

1. Vairam S, Kalyani P and Suba Ramesh, "Engineering Chemistry"., Wiley India PvtLtd., New Delhi., 2011
2. Richard T. Wright, Environmental Science: Toward a Sustainable Future, 10th edition, Prentice Hall, 2008
3. Ravikrishanan A, "Engineering Chemistry – I", Sri Krishana Hitech Publishing Company pvt, 16th Edition , 2013

Reference Books

1. T. Balachandran, *Materials Science*, Charulatha Publications, India, 2003.
2. Charles P. Poole, Jr., Frank J. Owens, *Introduction to nanotechnology*, Wiley India, 2009.
3. T. Pradeep, *A Text book of nanoscience and nanotechnology*, Tata Mc-Graw-Hill, New Delhi, 2012.

Web References

1. https://www.academia.edu/4975866/Waste_Water_Treatment
2. <https://www.shsu.edu/academics/agricultural-sciences-and-engineering-technology/documents/EnergySources.ppt>

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Dr. S. Deepa

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Annexure – 4

A20CHE508	PHARMACEUTICAL CHEMISTRY	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To about the terminology and important drugs and the mode of actions.
- To know application of disinfectants and antiseptics
- To study the basic function of antibiotics.
- To understand about the compositions of blood and other functions
- To know about the estimation of sugar and hemoglobin

Course Outcomes

After the completion of this course, the students will be able to

CO1- Learn about the terminology and important drugs and the mode of actions

CO2- Understand about the application of disinfectants and antiseptics.

CO3- Identify the function of antibiotics

CO4- Understand about the compositions of blood and other functions

CO5 - Know the estimation of sugar and hemoglobin

UNIT I TERMINOLOGY**(12 Hrs)**

Drugs, Pharmacy, Pharmacology, Pharmacognosy, Toxicology, Chemotherapy, Medicinally important compounds-Aluminium Alum, Aluminium hydroxide gel - Phosphorous -Phosphoric acid, Hypo phosphorus acid-Iron-Ferrous gluconate - Ferrous sulphate-Preparation, Properties ad uses.

UNIT II ANALGESIC AND ANTIPYRETICS**(12 Hrs)**

Types-Narcotic analgesics -Morphine, Heroin, Pethidine - Structure and Uses. Non-narcotic analgesics-Aspirin, Methyl Salicylate, Paracetamol, Phenactin- Preparation, Properties and Uses. Analgin, Indometacin, Sulindac Ibuprofen-Structure and Uses.

UNIT III ANTIBIOTICS**(12 Hrs)**

Introduction, Pencillin – Types, Structure, Properties, assay, SAR chloroamphenicol, Structure Properties, SAR. Streptomycin-Structure, Properties and Uses.

UNIT IV BLOOD**(12 Hrs)**

Blood: Composition of blood, Function of erythrocytes, leucocytes, platelets, Blood grouping and matching, Anticoagulant drugs, Haematological agents. Coagulation or blood clotting, Physiological function of plasma protein, Role of blood as oxygen carrier.

UNIT V CLINICAL CHEMISTRY**(12 Hrs)**

Determination of sugar(glucose) in serum – Folin and WV's method- O-toluidine method – diagnostic test for sugar in urine-Benedict's test, Determination of serum cholesterol- Sacketles method for total cholesterol-detection of cholesterol in urine- detection of anaemia- estimation of haemoglobin(Hb concentration)- red cell count-Principle, Apparatus and Reagents and Procedure.

Text Books

1.Jayashree Ghosh, A Text Book of Pharmaceutical Chemistry; 5th Ed., S.Chand and Company Ltd., New Delhi,2014.



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2. S.Lakshmi; Pharmaceutical Chemistry; 1st Ed., S.Chand and Company Ltd., New Delhi,2011.
3. Bhagavathi Sundari; Applied Chemistry; 1st Ed., MJP Publishers, Chennai, 2006.

Reference Books

1. Romas Nogrady, "Medicinal Chemistry", Oxford University, press, 2nd Edition, 2004.
2. AshuttoshKar, "Medicinal Chemistry", Wiley Eastern Ltd., New Delhi. 4th Edition, 1993.
3. David William & Thomas Lemke, "Foyes principles of medicinal chemistry", BI publishers, 5th edition, 2005.

Web References

1. <https://druginfo.nlm.nih.gov/drugportal/>
2. <https://www.nhsinform.scot/illnesses-and-conditions/a-to-z>
3. https://college.lclark.edu/offices/health_promotion_and_wellness/alcohol_drugs/drugs_health/

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Annexure - 5

SEMESTER – V										
Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CHT513	Inorganic Chemistry - III	DSC	4	0	0	4	25	75	100
2	A20CHT514	Organic Chemistry - III	DSC	4	0	0	4	25	75	100
3	A20CHT515	Physical Chemistry - III	DSC	4	0	0	4	25	75	100
4	A20CHE5XX	DSE - III*	DSE	4	0	0	4	25	75	100
Practical										
5	A20CHL516	Gravimetric Analysis and Preparation of Organic Compounds (Practical)	DSC	0	0	4	2	50	50	100
6	A20CHL517	Industrial Chemistry Practical	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
7	A20CHS505	Personality Development	SEC	4	0	0	2	100	-	100
Fifth Semester Total							22	300	400	700

*Discipline Specific Electives are to be selected from the list given in Annexure II

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Annexure – 6

A20CHL621	PHYSICAL CHEMISTRY PRACTICAL	L	T	P	C	Hrs
		0	0	4	2	30

Course Objectives

- To demonstrate the concept of transition temperature of hydrated salt
- To understand the critical solution temperature of phenol ester system
- To gain the knowledge on phase diagram
- To observe the rate constant of acids
- To know about potentiometric and conductometric titrations

Course Outcomes

After completion of this course, the students will be able to

- CO1 - Gain the knowledge in transition temperature of hydrated salt
 CO2 - Determine the critical solution temperature of phenol water system
 CO3 - Learn the phase diagram in the industrial applications
 CO4- Understand rate constant of acid – catalysed hydrolysis of ester
 CO5- Apply the potentiometric and conductometric titrations concept in the analysis

LIST OF EXPERIMENTS

1. Determination of Transition Temperature of the hydrated salt
2. Determination of Critical Solution Temperature of phenol water system.
3. Effect of impurity on Critical Solution Temperature
4. Phase Diagram (Simple eutectic system)
5. Determination of Rate constant of Acid –catalysed Hydrolysis of an Ester
6. Determination of Molecular Weight by Rast Macro Method
7. Kinetics of Persulphate - Iodide reaction: Determination of pseudo first order rate constant.
8. Conductometric Acid-Base Titration(HCl vs NaOH)
9. Potentiometric Redox Titration (FAS vs KMnO₄)
10. Determination of pH of a buffer solution potentiometrically using quinhydrone electrode

Text Books

1. B.R.Puri, L.R. Sharma and M.S. Pathania, "Principles of Physical chemistry", Vishal publication, Jalandhar-Delhi, India, 30th edition, 2007.
2. Billmeyer Jr., F.W, "A text book of Polymer Chemistry", John Willey and Sons, UK. 3rd Edition, 1984.
3. Glasstone S. A., "Text book of Physical Chemistry", McMillan India Ltd., 1st Edition, 1999.

Reference Books

1. V. Venkateswaran, R.Veerassamy, A.R.Kulandaivelu, "Basic principles of Practical Chemistry", New

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Delhi, Sultan Chand & sons, 2nd Edition, 1997. .

2. Sundaram, Krishnan, Raghavan, "Practical Chemistry - Part III, S. Viswanathan, Co. Pvt, 3rd Edition, 1996.

3. Vogel's, "Text Book of Quantitative Chemical Analysis", ELBS/Longman England, 5th Edition, 1989.

Web References

1. https://chem.libretexts.org/Courses/Mount_Royal_University/Chem_1201/Unit_1%3A_Quantum_Chemistry

2. https://mysite.science.uottawa.ca/sgambarotta/sites/default/files/CHM%201311F/slide%20show/Ch-6%20atom/7_lecture.pdf

3. https://en.wikipedia.org/wiki/Chemical_kinetics.

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2.E-6-26

Annexure – 7

A20CHL517

INDUSTRIAL CHEMISTRY
PRACTICAL

L	T	P	C	Hrs
0	0	4	2	30

Course Objectives

- To learn the basic principles of volumetric analysis
- To understand the determination of Dissolved Oxygen and COD.
- To know about basic concepts hardness and alkalinity in water.
- To identify the available chlorine in the bleaching powder
- To know about estimation of magnesium and vinegar.

Course Outcomes

After completion of this course, the students will be able to

- CO1 - Learn the basic principles of volumetric analysis
 CO2 - Determine the Dissolved Oxygen and COD in the water.
 CO3 - Know about determination of hardness and alkalinity of water.
 CO4- Identify available chlorine in the bleaching powder.
 CO5- Know about estimation of magnesium and vinegar.

LIST OF EXPERIMENTS

1. Determination of Dissolved Oxygen in water
2. Estimation of Chlorine in water by Mohr's method
3. Total hardness by water by EDTA method
4. Estimation of magnesium by EDTA method
5. Estimation of alkalinity of water sample by mixed indicator method
6. Estimation of vinegar
7. Estimation of available chlorine in bleaching powder
8. Determination of Chemical Oxygen Demand (COD) in a waste water sample.

Text Books

1. V. Venkateswaran, R.Veerasingam, A.R.Kulandaivelu, "Basic principles of Practical Chemistry, NewDelhi, Sultan Chand & sons, 2nd Edition, 1997.
2. Sundaram, Krishnan, Raghavan, "Practical Chemistry - Part III" S.Viswanathan Co. Pvt, 2nd Edition, 1996.
3. D.A. Skoog, D.M. West and F.J. Holler, "Analytical Chemistry: An Introduction", Saunders college publishing, Philadelphia, 5th Edition, 1990.

Reference Books

1. Vogel's, "Text Book of Quantitative Chemical Analysis", ELBS/Longman England, 5th Edition, 1989.
2. David P. Shoemaker, Carl W. Garland, Joseph W. Nibler, "Experiments in Physical Chemistry", McGraw- Hill Book Company, 5th Edition, 1989.

Web References

1. https://www.ikbooks.com/home/samplechapter?filename=114_Sample_Chapter.pdf
2. https://uomus.edu.iq/img/lectures21/WameedMUClecture_2021_9278626.pdf
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5197480/pdf/indmedgaz72101-0013.pdf>

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Annexure - 8

SEMESTER - VI										
Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CHT618	Inorganic Chemistry - IV	DSC	4	0	0	4	25	75	100
2	A20CHT619	Organic Chemistry - IV	DSC	4	0	0	4	25	75	100
3	A20CHT620	Physical Chemistry - IV	DSC	4	0	0	4	25	75	100
4	A20CHE5XX	DSE - IV*	DSE	4	0	0	4	25	75	100
Practical										
5	A20CHL621	Physical Chemistry Practical	DSC	0	0	4	2	50	50	100
6	A20CHP622	Core Based Project	DSC	0	0	10	5	40	60	100
Employability Enhancement Course										
Sixth Semester Total							23	190	410	600

*Discipline Specific Electives are to be selected from the list given in Annexure II

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2.E.6.30

Annexure – 9

A20CHT619	ORGANIC CHEMISTRY IV	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To gain knowledge on chemistry of heterocyclics and their applications in dye industry
- To understand the role of heterocyclics in natural product
- To get idea about thermal and photochemical reactions
- To study chemical properties of amino acids, proteins and enzymes
- To improve knowledge mass spectroscopy

Course Outcomes

After completion of this course, the students will be able to

- CO1**-Recall the chemistry of heterocyclics and their applications in dye industry
CO2 - Explain the role of heterocyclics in natural product chemistry
CO3 - Compare thermal and photochemical reactions.
CO4 - Utilize the chemical properties of amino acids, proteins and enzymes.
CO5 – Understand on the mass spectroscopy.

UNIT I HETROCYCLIC COMPOUNDS AND DYES**(12 Hrs)**

Introduction to heterocyclic compounds, Nomenclature – preparation and reactions of furan, thiophene, pyrrole, pyridine, quinoline, isoquinoline and indole. Introduction to dyes – colour and constitution - Classification based on structure and application – preparation and applications of the following dyes – methyl orange, congo red, malachite green, fluorescein, phenolphthalein and indigo.

UNIT II CHEMISTRY OF NATURAL PRODUCTS**(12 Hrs)**

Alkaloids: Introduction - general characteristics - classification – Hofmann Exhaustive methylation - structure and synthesis of the following alkaloids – piperine, nicotine, and atropine. Terpenoids: Introduction and classification - isoprene rule – gem dialkyl rule - structure, synthesis and stereochemistry of the following terpenoids – citral, menthol and camphor.

UNIT III ORGANIC PHOTOCHEMISTRY**(12 Hrs)**

Introduction to photochemical reaction - photochemical reactions of carbonyl compounds: Difference between photochemical and thermal reaction - Norrish type I and II reactions, photo elimination - photo reductions - photo oxidations - Cis-trans isomerisation – rearrangements – Cyclisation (Diel's Alder reaction) – Woodward – Hofmann rules for cyclo additions.

UNIT IV AMINO ACIDS, PEPTIDES, PROTEINS AND ENZYMES**(12 Hrs)**

Strecker synthesis using Gabriel's phthalimide synthesis. Zwitter ion, Isoelectric point and Electrophoresis – Protection of –COOH group and –NH₂ group – ninhydrin test. Enzymes – specificity – Prosthetic group – co-enzyme, apoenzyme, holoenzyme, co-factor – nomenclature and classification of enzyme – application of enzymes.

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UNIT V MASS SPECTROSCOPY

Mass spectroscopy - basic principles instrumentation - molecular ion peak, base peak, metastable peak, isotopic peak their uses. Fragmentation – Nitrogen rule - determination of molecular formulae – mass spectrum of simple organic compounds – identification – alcohols, aldehydes, aromatic hydrocarbons.

Text Books

1. Bhupinder Mehta, Manju Mehta, "Organic Chemistry", Prentice Hall of India Pvt Ltd., New Delhi, 5th Edition, 2015.
2. Bahl, A. and Bahl, B.S. "A Text Book of Organic Chemistry", S. Chand & Company Limited, New Delhi, 22nd Edition, 2009.
3. K. R. Desai, "Green Chemistry", Himalaya Publishing House, Mumbai, 3rd Edition, 2005.

Reference books

1. I.L.Finar, "Organic Chemistry" Vol 1, Pearson Edition Singapore 6th Edition, 2005.
2. K.S.Tewari, N.K.Vishil and S.N.Mehotra, "A text book of Organic Chemistry", 1st Edition, Vikas Publishing House Pvt. Ltd, New Delhi 1st Edition, 2001.
3. R.T. Morrison and R.N. Boyd, "Organic Chemistry", Prentice Hall Private Limited, New Delhi, 6th Edition, 1997.

Web References

1. <https://www.slideshare.net/AZCPh/heterocyclic-compounds-organic-chemistry-b-pharm>
2. [https://mpascollege.edu.in/lib_docs/photochemistry%20ppt%20\(1\).pptx](https://mpascollege.edu.in/lib_docs/photochemistry%20ppt%20(1).pptx)
3. https://www.tvu.edu.in/wp-content/uploads/2020/03/Green-Chemistry_Dr.S.Syed-Shafi-16-10-2019-1.ppt

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Annexure – 10

A20CHT620	PHYSICAL CHEMISTRY IV	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To gain knowledge on electrochemistry
- To understand emf and measurement
- To get idea about thermal and photochemical reactions
- To study about colloids
- To improve knowledge surface chemistry

Course Outcomes

- After completion of this course, the students will be able to*
- CO1-** apply the concept in the titration, pH and Buffer solution
CO2 - Explain emf measurement and applications
CO3 - Compare thermal and photochemical reactions.
CO4 – understand the colloids, types and applications.
CO5 – know the types of adsorption and applications.

UNIT I ELECTRO CHEMISTRY – I**(12 Hrs)**

Conductance: Electrical conductance in solution – Ohm's law and Faraday's law, specific, equivalent and molar conductance, variation of conductance with dilution – Oswald's dilution law, Kohlrausch's law and its application, conductometric titrations (Strong acid and strong base, weak acid and weak base) Ionic equilibria: Ionic product of water, Ionization constant of weak acids and bases, p^H , p^{OH} and pK_a , buffer solutions – Henderson-Haselbach equation, common ion effect (definition only).

UNIT II ELECTROCHEMISTRY – II**(12 Hrs)**

Electrochemical cells – Galvanic cells and EMF, electrode reaction and electrode potential – thermodynamics of cells -concentration cells, measurement of EMF (Poggendorf's method) and its applications, Nernst's equation - standard electrode potential –representation of cells- Electrochemical cells, dry cell – Leclanche's cell, lead storage battery, potentiometric titration (FAS Vs $K_2Cr_2O_7$ only), fuel cells – hydrogen-oxygen fuel cell.

UNIT III PHYSICAL PHOTOCHEMISTRY**(12 Hrs)**

Introduction-definition-Absorption of photochemical reactions, Absorption of radiation – Laws of photochemistry – quantum efficiency, thermal and photochemical reactions, Jablonski diagram – fluorescence and phosphorescence – photosensitization – chemluminescence – bioluminescence – Hydrogen – bromine reaction, Hydrogen -chlorine reaction.

UNIT IV COLLOIDS**(12 Hrs)**

Definition-Difference between true solution, colloidal solution and suspension – classification of colloids, difference between lyophilic and lyophobic colloids, preparation and properties of colloids-

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electrical double layer- zeta potential – coagulation, Hardy Schulze law, Hofmeister series protective effects – protective colloids - gold number – gels, thixotrophy, synerisis and imbibition –applications of colloids (purification of drinking water, pollution control, sewage disposal, medicine and detergent)

UNIT V SURFACE CHEMISTRY

(12 Hrs)

Definition-Adsorption, adsorbent, adsorbate, occlusion - types of adsorption-Differences between physisorption and chemisorption-Langmuir's and Freundlich adsorption isotherms, positive and negative adsorption, application of adsorption (gas masks, chromatography, preserving vacuum, cleaning of sugar, paint industry and catalysis).

Text Books

1. Puri B.R., Sharma L.R. and Pathania M.S., "Principles of Physical chemistry", Vishal publication, Jalandhar, Delhi, India, 30th Edition, 2007.
2. G. D. Tuli, B. S. Bahl, ArunBahl, "Essentials of Physical Chemistry", S.Chand Publication, 24th Edition, 2000.
3. Glasstone S. A., "Text book of Physical Chemistry", McMillan India Ltd., 1st Edition, 1999.

Reference Books

1. Bokris J. O. M. and Reddy A. K. N., "Modern Electrochemistry", Vol. I and Vol. II, Plenum Press, New York, USA, 2nd Edition, 1998.
2. Glasstone S. A., "Text book of Physical Chemistry", McMillan India Ltd., 1st Edition, 1999.
3. Rahatgi Mukherjee, "Fundamentals of Photochemistry", Willey Eastern Ltd., New York, USA, 4th Edition, 1994

Web References

1. <https://www.slideshare.net/pratiksudra10/electrochemistry-42149094>
2. <http://www.jiwaji.edu/pdf/ecourse/pharmaceutical/colloidal%20dispersion%20ppt.pdf>
3. <https://www.ssgopalganj.in/online/Online%20Class%20-20PPT/Class%2012/Chemistry/ch%205%20ppt%20surface%20chemistry.pptx>

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Annexure – 11

A20CHE610	MEDICINAL CHEMISTRY	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To gain knowledge on medicinal chemistry
- To improve knowledge on anesthetics, analgesics and antipyretics
- To get idea about sulpha drugs and antibiotics
- To study about drug design
- To improve knowledge drug design

Course Outcomes

After completion of this course, the students will be able to

- CO1-** Understand anaesthetics, analgesics, antibiotics and antimalarial medicines
CO2 – Apply anesthetics, analgesics and antipyretics in the human treatment
CO3 – Understand the action of sulpha drugs and antibiotics on human cells.
CO4 – Understand the various process in the drug design.
CO5 – Know the synthesis of drug

UNIT: I MEDICINAL CHEMISTRY:

Chemotherapy: Introduction a) Anesthetics: Definition-classification with examples. b) Analgesics: Definition- classification with examples. c) Antibiotics-Definition-uses of penicillin, streptomycin, tetracycline and chloramphenicol. d) Antimalarial Drugs-Definition- mode of action- examples.

UNIT: II ANAESTHETICS, ANALGESICS AND ANTIPYRETICS:

a) Anaesthetics: Definition- classification- applications of nitrous oxide and chloroform. b) Analgesics: Definition mode of action-specific applications of antipyrine and aspirin. c) Antipyretics: Definition- mode of action- medicinal uses of salol and paracetamol.

UNIT: III SULPHA DRUGS AND ANTIBIOTICS

a) Sulpha drugs: Definition-mode of action-applications of sulphanilamide and sulphapyridine. b) Antibiotics: Definition- characteristics- mode of action- structure and uses of the following antibiotics- penicillins and tetracyclins.

Unit – IV :Introduction to Drug Design

a) ADME Properties The pharmacokinetics phase-Adsorption-Distribution, Metabolism Elimination- Bioavailability of drug. pharmacokinetics models, Intravascular and Extravascular administration. The use of pharmacokinetics in Drug design.

b) Pharmacodynamics - Stereoelectronic structure

Unit V Synthesis of Drugs

a) Synthesis of Antineoplastic agents Mechlorethamine, Cyclophosphamide uracil, mustards and 6-mercaptopurine

b) Synthesis of cardiovascular drugs Amyl-nitrate, sorbitrate, Verapamil.



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c) Synthesis of Psychoactive drugs Synthesis of Diazepam, Chlorazepam, oxazepam, Alprazolam, Phenyltoin or Diphenylhydantoin, Barbitol, Phenobarbital.

Text Books

1. AshotoshKaur, "Medicinal Chemistry", 3rd Edition, New Age International Pvt. Limited, New Delhi, 2006.
2. BagavathiSundari. K., "Applied Chemistry", MJP Publishers, Chennai, 2006.
3. Ramakrishnan, K.G. Prasannam and R.Rajan, Textbook of medical biochemistry, Orient Longman Ltd. 2nd Edn., 2001.

Reference Books

1. AshotoshKaur, "Medicinal Chemistry", 3rd Edition, New Age International (Pvt.) Limited, New Delhi, 2006.
2. Bhalerao Marry & Giragon, "Pharmaceutical Chemistry", Himalaya Publishing House, Ramdoot, 2001.
3. Kadam S., "Principles of Medicinal Chemistry", Nirali Prakashan, New Delhi, 2006.

Web References

1. https://www.lossiehigh.co.uk/_documents/%5B253471%5DMedicinal_Chemistry.ppt
2. http://harpercollege.edu/is-hs/nur/120/sdolezal/lesson6_files/lesson6.ppt
3. <https://www.kgmu.org/download/virtualclass/Pharmacology/37.ppt>

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Annexure – 12

A20CHE611

AGRICULTURAL CHEMISTRY

L	T	P	C	Hrs
4	0	0	4	60

Course Objectives

- To gain knowledge on soil, texture of soil and various properties of soil
- To improve knowledge on importance of fertilizers
- To get idea about manure and green manure
- To study classification, uses and effects of pesticides
- To improve the knowledge on genetically modified organisms

Course Outcomes

After completion of this course, the students will be able to

- CO1- Understand soil, texture of soil and various properties of soil
 CO2 – Apply fertilizers on soil based on the requirement.
 CO3 – Know the classification and preparation of manure
 CO4 – Understand classification, uses and effects of pesticides.
 CO5 - Understand genetically modified organisms

UNIT I SOIL

(12Hrs)

Introduction to soil – soil classifications & survey – properties of soil – soil texture – soil water – soil temperature – soil colloids – soil minerals – soil pH – acidity & alkalinity – Buffering of soil – soil fertility – soil formation

UNIT II FERTILIZERS

(12Hrs)

Definition – classification of fertilizer – nitrogenous – phosphate & potash fertilizers – effect of fertilizer on plant growth – commercial method of preparation of urea, Ammonium phosphate, Triple superphosphate – Secondary nutrients – micronutrients and their function in plants.

UNIT III MANURES

(12Hrs)

Classification & importance of organic manures, properties & methods of preparation of bulky manures – Farm yard manure – fish manure – compost – Green manuring – night soil – Biogas-concentrated organic manure, importance of C: N ratio in rate of decomposition.

UNIT IV PESTICIDES

(12Hrs)

Historical background of pesticides – classification of Pesticides –methods of pest control – insecticides – DDT, BHC – Herbicides – 2, 4 D & 2, 4, 5, 7 – fungicides – borderaux mixture. Benefits of pesticides – Adverse effects of pesticides.

UNIT V GENETICALLY MODIFIED ORGANISMS

(12Hrs)

Genetically modified crops – Actualities & potential, Resistance to genetically modified foods – moral issues, political issue, health & environmental issues. Benefits of genetically modified food, organic foods.

Text Books

1. M. Subhashini "Agricultural Chemistry" –, 2017, Crystal publishers, Chennai, S 2nd Edition, 2017.
2. Brady. N. C. The Nature & properties of soils- Emasia publishing. Housae (P) Ltd 4th Edition -2003
3. A. K. De "Environmental Chemistry" New Age Publisher International Pvt Ltd First Edition, 2016

Reference Books

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1. B. A. Yagodin. Agricultural Chemistry, vol I & II Mir Publishers (Mos COW), 1976 new century books (P) Ltd.
2. R. Cremlyn, Pesticides, Jhone Wiley New York 1978
3. Jayashree Ghost., Fundamental concept of Applied Chemistry., S. Chand & CO Ltd., 7th Edition 2010

Web References

1. <https://www.soils.org/files/about-soils/soils-overview.pdf>
2. https://hidot.hawaii.gov/highways/files/2013/02/Landscape-ch11_FERTILIZERS.pdf
3. <https://opjsrgh.in/Content/Worksheet/PRACTICE-WS/2021-2022/day32/12-AGRICULTURE.pdf>

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Annexure - 13

A20CHT513	INORGANIC CHEMISTRY - III	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To acquire the knowledge of solid state of crystal
- To study the solid state of crystal defects
- To know the general properties of d-block elements
- To study the chemistry of catalysis and organo metallic compounds
- To know general properties of f-block elements

Course Outcomes

After the completion of this course, the students will be able to

- CO1-** Understand different types of solid and their properties with suitable examples.
CO2- Explain types of crystals, crystal defects and their application in semiconductor, solar cell and super conductor materials.
CO3- Outline the periodic properties of d-block elements, metallurgy, properties of common reagents and alloys of gold, chromium and nickel.
CO4- Apply the catalytic and importance of metal compounds.
CO5- Make use of the periodic trends, separation, uses of lanthanide and actinides.

UNIT I SOLID STATE- I**(12 Hrs)**

Types of solids – Amorphous – crystalline - Unit cell & Space lattice - Seven Crystal systems- Bravies Lattice Crystal systems - Miller indices – Bragg equation - co-ordination number – Atomic radius , packing factor for FCC and HCP structures. Structures of Cesium chloride, Zinc blende, Diamond and Graphite.

UNIT II SOLID STATE- II**(12 Hrs)**

Crystal defects, schottky and frenkel defects – colourcentres – point defects – plane defects – edge dislocation – non-stoichiometric defects – Semiconductors – Application of solar cell-Types of crystals Molecular , Covalent, Metallic and Ionic crystals-Free electron theory and band theory of solids – P-N junction – Transistors – super conductors.-High temperature and low temperature super conductors, Organic super conductors.

UNIT III D-BLOCK ELEMENTS**(12 Hrs)**

General characteristics- electronic configuration, metallic character, ionization energy, variable valency, reducing property, colour, magnetic property, non-stoichiometric compounds, catalytic properties and tendency to form complexes. Metallurgy of Au, Ni and Cr. Preparation, properties and uses of potassium permanganate, V_2O_5 , Ni (DMG) $_2$, CrO_3 , potassium dichromate, potassium ferrocyanide-Nessler's reagent. Amalorous behaviour of mercury. Alloys of copper and Nickel.



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UNIT IV**(12 Hrs)****A. TRANSITION METAL COMPOUNDS AS CATALYSTS**

Wilkinson catalyst (hydrogenation of olefins) – Zeigler-Natta catalyst (propylene polymerization) – organo palladium catalyst – Walker's process (oxidation of olefins) – Mechanism of these processes.

B. ORGANOMETALLIC COMPOUNDS

Definition-Types- Alkene complexes—Zeise's Salt-Structural Features of Zeise's Salt-Iron- Butadiene Complex-Nomenclature of organometallic compounds, 16- and 18-electron rule, Ferrocene- structure and Bonding. Monsanto process-Hydroformylation- Mechanism of these processes.

UNIT V f- BLOCK ELEMENTS**(12 Hrs)**

General characteristics- electronic configuration- oxidation states- colour and magnetic properties. Complexes of lanthanides and actinides. Lanthanide and actinide contraction and their consequences- Uses of Lanthanides as Shift reagents. Separation methods-fractional crystallization, oxidation- reduction, ion-exchange method and chromatographic separation. Uranium-occurrence, metallurgy; Properties of Uranyl nitrate and Uranyl acetate.

Text Books

1. B.R. Puri, L.R. Sharma and K.C. Kalia "Principles of Inorganic Chemistry" Vallabh Publication New Delhi, 28th Edition, 2004.
2. R.D. Madan, "Advanced Inorganic Chemistry", Chand & Company, New Delhi. 2nd Edition, 2005.
3. J. E. Huheey, Keiter, Ellen A. Keiter, L. Richard "Inorganic Chemistry", Pearson Education Pvt Ltd, Harper Collins College Publishers, Singapore. 4th Edition, 2004.

Reference Books

1. N.B. Hannay, "Solid State Chemistry", Prentice-Hall of India Pvt Ltd, New Delhi, 1976.
2. B. Anthony, R. West, "Solid State Chemistry and its applications", John Wiley & Sons, Singapore, 1989.
3. F.A. Albert Cotton, "Advanced Inorganic Chemistry", Geoffrey Wilkinson, Carlos, Murillo, Manfred Bochmann, John Wiley & Sons, Inc. New York, 1998.

Web References

1. <https://www.vedantu.com/iit-jee/d-block-elements>
2. <https://byjus.com/jeet/f-block-elements/>
3. https://en.wikipedia.org/wiki/Solid-state_physics

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