

J.J. College of Arts and Science (A) Pudukkottai

Ms. P. Santhiya priya

Asst prof of chemistry

Department of chemistry.

Title :

1. General chemistry - IV - (II - chemistry)
2. Allied chemistry - I - (II - physics)
3. Allied chemistry - I - (Bot, Bio che)

	1	2	3	4	5
D ₁	II Vot			II phy	
D ₂		II Vot		ALL	
D ₃		II phy	ALL		
D ₄	II phy	II Vot	II phy	ALL	
D ₅	II Vot				ALL
D ₆			ALL		II Vot

e. u. n. t.
25/4/23
Dr. C. MUTHUKUMAR, M.Sc., M.Phil., B.Ed., Ph.D.
Head, Dept. of Chemistry
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SIVAPURAM
PUDUKKOTTAI - 622 422



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Colloids.

Day Order: 1

Date: 1/7/22

The Colloidal Soln (or) Colloidal dispersion are Intermediate b/w true soln & suspensions

Classification:

1. Physical state dispersed Phase & Dispersion medium.
2. Nature of Interaction b/w Dispersed Phase & Dispersion medium.

i) Solid $\left\{ \begin{array}{l} \rightarrow \text{Solid} \\ \rightarrow \text{Liquid} \\ \rightarrow \text{Gas.} \end{array} \right.$

ii) Liquid $\left\{ \begin{array}{l} \rightarrow \text{Solid} \\ \rightarrow \text{Liquid} \\ \rightarrow \text{gas.} \end{array} \right.$

iii) Gas $\left\{ \begin{array}{l} \rightarrow \text{Solid} \\ \rightarrow \text{Liquid.} \end{array} \right.$

Solid - Solid - Solid solution - alloys.
Solid - Liquid - Soln - Paint.

2. 1. Lyophilic Solution

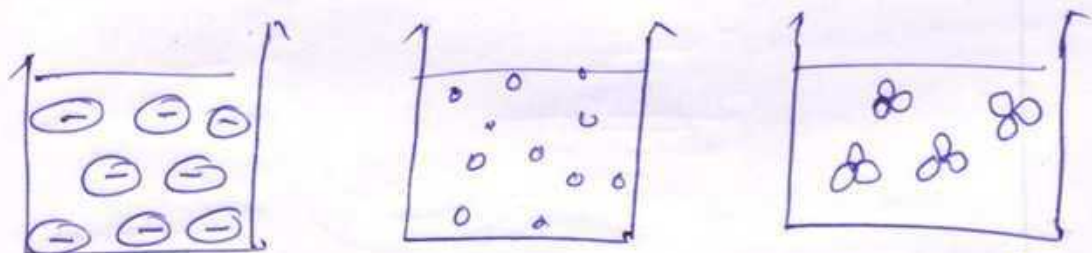
2. Lyophobic Solution.

$\rightarrow$ E-Content

charged solutions
 → By boiling.

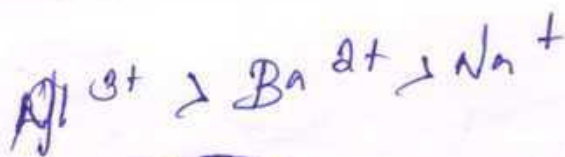
Day order : D,
 Date : 26/10/02

electrolytes.



Na⁺ ions added Discharged Coagulation
 to negative Solution. Solution particles Coagulation
 of a Solution.

→ Thus for precipitating power of
 Al³⁺, Ba²⁺, Na⁺ ions is in the Order.



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S. Kalavani

J. J. College of Arts & Sciences

Lesson plan note.

July 2022 - Nov 2022

Papers:

II B.Sc chemistry: Value Education.

III B.Sc chemistry: Agricultural chemistry

II M.Sc chemistry: Natural products

I M.Sc chemistry: Bio-organic chemistry

Pr	^{ms} I	II	III	IV	V
D1		IIPOT Lab (Phy-I)			
D2			IIU	IIU	
D3	Ipot		IIPOT	IIPOT	IIPOT
D4		Ipot		Ipot	Ipot
D5	IIPOT		IIU		IIPOT
D6			Ipot	IIU	Ipot

Nov-2022
May-2022

Day: 13.

Date: 5.7.22.

hr: 3, 4.

Alkaloids - Introduction.

⇒ Alkaloids are plant-produced basic alkaline compound.

⇒ Which contain one (or) more nitrogen heterocyclic rings

⇒ It have profound physiological effect on humans.

⇒ They are naturally-occurring organic compounds containing nitrogen moiety and are usually heterocyclic in nature.

Day: 14

Date: 6.7.22.

hr: 2, 4.

Classification of alkaloids.

The individual alkaloids are frequently called by common names.

Alkaloids are divided into classes depending upon the prominent heterocyclic ring system present in the molecule.

* pyridine eg: Nicotine

* piperidine eg: Coniine, Piperine.

* Quinoline eg: Quinine

* Isoquinoline eg: Papaverine

* Indole eg: Gramine.

8/7/22

Day: 2

hr: 3

Date: 17.6.22

Safe handling of pesticide

- ⇒ It should be in closed containers & kept at separate place.
- ⇒ It should be avoid near the food & medicines
- ⇒ Use separate knife for opening pesticide containers & bags.
- ⇒ Empty containers should be kept away from the children & it should be destroyed.
- ⇒ Do not eat when you are using the pesticide
- ⇒ Should wear gloves, when you are mixing the pesticide.

Day: 3

Date: 18.6.22

hr: 2

Impact of pesticides on soil, plants & environment

① pesticides accumulation in the fatty tissues of various organisms including man via plants & vegetables, soil etc accumulation in food chain has disastrous effects.

② Insects develop resistance against insecticide after a certain period of time thus the effectiveness of the insecticides decreases considerably

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MAJOR BASED ELECTIVE COURSE-B: POLYMER CHEMISTRY

Course Code:

Hours/Week: 5

Credit: 4

Max. Marks: 100

Internal Marks: 25

External Marks: 75

Objectives:

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Assistant Professor of Chemistry,

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Unit - I: Introduction to Polymers

1.1. Importance of polymer chemistry and polymer-definition, Classification of polymers on the basis of source, structure and application (theoretical)

1.2. Importance of polymer chemistry and polymer-definition, Classification of polymers on the basis of source, structure and application (theoretical)

1.3. Importance of polymer chemistry and polymer-definition, Classification of polymers on the basis of source, structure and application (theoretical)

1.4. Importance of polymer chemistry and polymer-definition, Classification of polymers on the basis of source, structure and application (theoretical)

1.5. Importance of polymer chemistry and polymer-definition, Classification of polymers on the basis of source, structure and application (theoretical)

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1.21. Importance of polymer chemistry and polymer-definition, Classification of polymers on the basis of source, structure and application (theoretical)

1.22. Importance of polymer chemistry and polymer-definition, Classification of polymers on the basis of source, structure and application (theoretical)

1.23. Importance of polymer chemistry and polymer-definition, Classification of polymers on the basis of source, structure and application (theoretical)

DAY/Period	I	II	III	IV	V
1		II BHM	III UG		
2	II BHM	II PG	III UG		
3		II BHM	III UG	II PG	
4	II PG		II BHM	III UG	
5		II PG		III UG	II PG.
6		← PG Lab →			

date

Day / Hour

Lesson plan (UNIT-1)

7.22

2

4

Introduction of biomimeticization, element used in biological function. Bulk metal, trace metals, toxic metals. Bioactivity and accompanying metals.

7.22

4

1, 3, 5

% of element in Earth crust $O = 47$, $Si = 28$ %, $Al = 7.9$, $Fe = 4.5$, $Ca = 3.5$, $Mg = 2.5$, $K = 2.5$, $Mn = 0.1$, $Zn = 0.007$, $Cu = 0.006$, $Ni = 0.008$, $Co = 0.001$, $Pb = 0.0001$, $Ag = 0.00001$, $Au = 0.000001$. More shift with brief explanation.

7.22

3

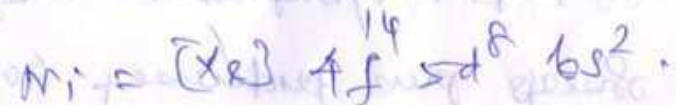
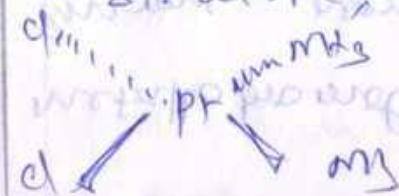
- carbonic anhydrase, an enzyme, which converts H_2O_2 to CO_2 / zinc finger proteins which recog
- mze specific DNA sequences and are involved in gene function / LAM, which facilitate the inter conversion between alcohol and aldehyde.

7.22

5

2

- structure, Hybridization of Cs -platin

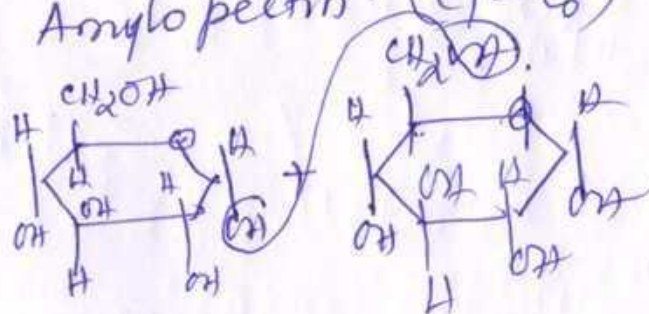


Unit 5

Date ..

Topic : Bio polymer

Amorphous (C₁-C₆)



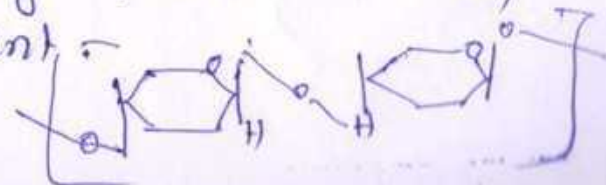
Sources :

- Found in wood, plants, fibres, cereal, cotton etc.
- About 33% plant matter is cellulose.
- Insoluble in water.

Classified as non-reducing carbohydrate.

Uses:

Used for supporting framework and rigidity to the plant.



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SEMESTER-V: CO-ORDINATED COURSE IN INORGANIC CHEMISTRY

Course Code: U5RICHCC9

Max. Marks: 120

Lesson Plan Note - June - 2022

Credit: 3

Day/ Pr	1	2	3	4	5
D1			IV		IV
D2	I max. Inorganic Lab →				
D3	IIIU		IV	IIIU	
D4	IV		IIIU		IV
D5	IIIU			IIIU	
D6		IIIU		IV	

I Bsc. chem ⇒ General chemistry - I ($U1R2CHCC1$)

III Bsc. chem ⇒ Inorganic chemistry ($U5R1CHCC9$)

Date & Hr: 5.7.22 - D3-I
class: III Bsc. chemistry

Topic: Coordination compounds

Compounds

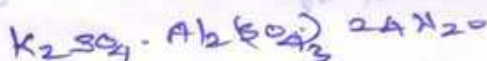
Simple compounds

molecular compounds

Double salts

Stable only in solid state

Individual constituents



Coordination compounds



Date & Hr: 5.7.22 - D3-I

class: III Bsc. chem

Topic: Terminologies in coordination compounds

Coordination compounds.

central metal ion

Ligand

Negative, +ve, Neutral

Monodentate ... etc.

Coordination number

Coordination sphere

Oxidation State

Date: 26.10.22
Class: I Bsc. chemistry
Topic: Periodic properties

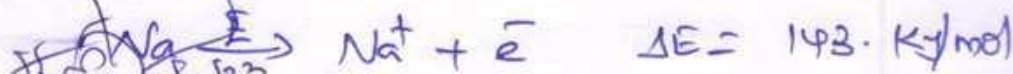
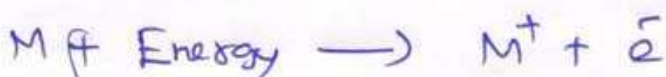
⇒ Repetition of similar properties after particular interval.

1. Atomic Radii
2. Ionisation Energy
3. Electron affinity
4. Electronegativity
5. Metallic nature
6. Oxidation state.
7. Hydration Energy.

Date: 27.10.22
Class: I Bsc. chemistry

Topic: Ionisation Energy

Amount of energy require to remove e^- from valence shell of an atom.



Variation in Period from Left to right

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* Nuclear charge increase

* Force of attraction increase

* Ionisation energy increase

G. Suresh

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Lesson plan Note

Date : 17/2/2022

Day order : Q1

Topic : Rate of the reaction

The rate of a chemical reaction is defined as the change in concentration of any of the reactants in unit time. With the progress of time, the concentration of the reactant decreases while that of the product increases.

If dx is the change in concentration at a time interval of dt , then,

$$\text{Rate of the reaction} = dx/dt$$

Date : 47-2022

Day order : Q2

Topic : Rate Constant

The rate constant " k " of a reactant is defined as the change in concentration of reactants or products per unit time in a reaction in which all the reactants are at unit concentration.

Concentration

The rate of reactions are directly proportional to the concentrations of the reacting species.

determination of concentration of drugs,
metal ions.

* determination of cations and anions
in the presence of Interfering Ions.

* Amount of oxygen Dissolved
in aqueous solution can be calculated

C. Par



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28/4/23
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ASST . professor in chemistry

J.J . College of Arts and Science (A)
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* Organic Chemistry - I

* physical methods in chemistry - II

* Reaction Mechanism and Stereo
Chemistry
(PIR2CHCC)

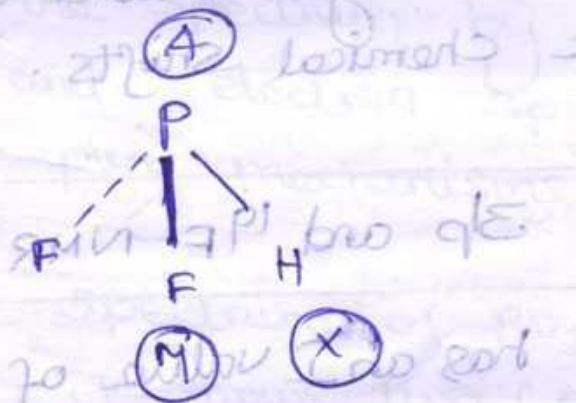
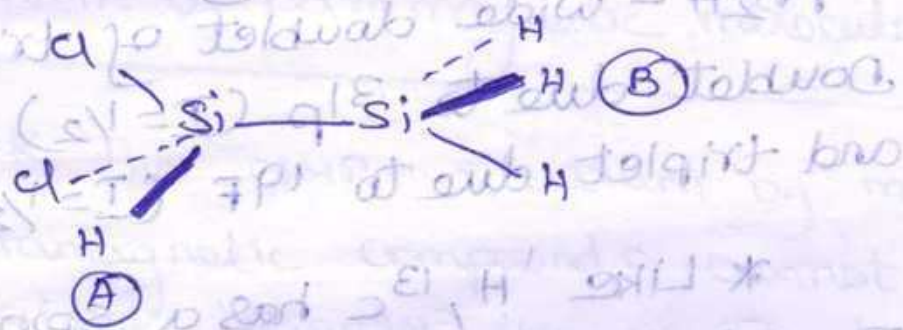
	1	2	3	4	5
D1	$\overline{\text{III}}\text{U}$				
D2	$\overline{\text{III}}\text{U}$	$\overline{\text{II}}\text{PN}$			$\overline{\text{II}}\text{PN}$
D3	$\overline{\text{II}}\text{PN}$	$\overline{\text{I}}\text{PN}$		$\overline{\text{II}}\text{PN}$	$\overline{\text{I}}\text{PN}$
D4					
D5	$\overline{\text{I}}\text{PN}$	$\overline{\text{III}}\text{U}$		$\overline{\text{II}}\text{PN}$	$\overline{\text{III}}\text{U}$
D6	$\overline{\text{IV}}\text{U}$		$\overline{\text{I}}\text{PN}$		

4.7.22

D2 II V

Different spin system in NMR

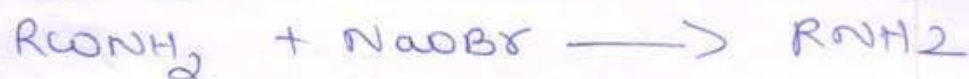
NMR spectrum is classified into AB, AX, ABC, AMX etc systems. Each chemically distinct nucleus is assigned a letter of such nuclei present. If the chemical shift difference for two sets of nuclei is much greater than the coupling constant between them, letters well apart like AX are given. $\text{SiCl}_2\text{HSiH}_3$ has an [AB₃], PF_2H an [AM₂X] and IF_5 an [AB₄] spin systems.



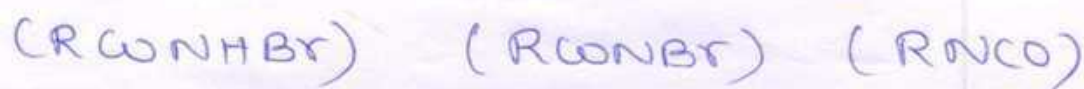
18.10.22
D3-III

Isolation and Trapping of an intermediate

* Isolate the intermediate by stopping the reaction before it is completed.

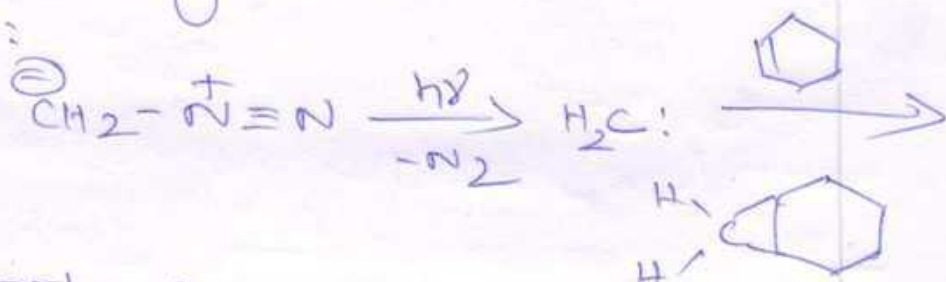


Isolate three intermediates



* Trapping of an Intermediate by running the reaction.

Ex:



carbenes are trapped by cyclopropane derivatives.

20.10.22
D6-III

Hammett and Taft equation

* The influence of substituents on molecular reactivity is accounted by Hammett equation. Hammett equation is given in the following form.

$$\log(k/k_0) = \sigma \rho$$

* Taft has examined aliphatic reactions and introduced a new parameter called as σ^* . His equation is supposed to represent the inductive effect of substituents in the compounds.



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IDC - Basic Concepts in Biochemistry

Code: U5RCHIDC1

Time table

DAY	1	2	3	4	5
D1				III	IV
D2					
D3					
D4					
D5					
D6			III	IV	

01-7-22

Carbohydrates - Introduction - 5th

* Carbohydrates include a large group of compounds commonly known as starches or sugars, widely distributed as polyhydric alcohols, having potentially active aldehyde and ketone groups.

In general, carbohydrates are white solids, freely soluble in water with the exception of certain poly-saccharides. Carbohydrates of lower molecular weight have a sweet taste

eg Glucose
Sucrose
Cellulose

4/7/22

Biological Significance:-

- Vhr

* The chief function of carbohydrates in the body is that of a fuel. When carbohydrates are oxidised in the body they liberate carbon dioxide, water and energy. They supply the major portion of energy required by living cells.

* Certain products of carbohydrate metabolism, as will be seen later, act as catalysts to promote oxidation of food-stuffs.

* Certain Carbohydrates can be used as the starting material for biological synthesis of compounds such as fatty acids and amino acids.

27/07/23

Starch

Starch or amyllum is a polymer carbohydrate consisting of numerous glucose units joined by α -D glycoside bonds. This polysaccharide is produced by most green plants for energy storage. Starch consists of glucose molecules. It can occur in two forms; amylose and amylopectin. Amylose is a linear or straight-line polymer that scientists describe as amorphous or helical. Amylopectin forms a branched chain and is crystalline. Different plants contain varying ratios of these polysaccharide units.

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II Msc Chemistry
 Instrumental Methods of Analysis
 Code: P4RICHEC 4:1

	1	2	3	4	5
D ₁					
D ₂	II PA				
D ₃	II PA				
D ₄					
D ₅	II PA				
D ₆					

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13/12/22

Chromatography

I Ar

Solvent extract:-

Solvent extraction is a very simple and sensitive technique, useable over a wide range of accelerants. The evidence container is opened and a small quantity (depending on the amount of debris in the container) of a suitable solvent is added. CS_2 is the most popular solvent for this process. The solvent is then poured off and filtered and then evaporated to a small volume leaving behind the accelerant residue. This solution can then be introduced into a gas chromatograph. Disadvantages of solvent extraction are, first, that the solvent will also dissolve unwanted pyrolysis products, matrix materials, and other substances some of which may interfere with the subsequent analysis may also cause evaporation of some of the volatile components of the accelerant residues.

- types : Solvating Extraction
- Cationic Exchange
- Anionic Exchange
- Chelating Extraction

26/12/22

GC-MS Techniques. Thr

Gas chromatograph Mass Spectrometers (GC-MS) are able to be applied to qualitative analysis that are required in various field including energy for green society, materials such as semiconductor and plastics and environment and food for safety and security. This equipment is an analysis tool that is expected to become increasingly indispensable in the future. We have a variety of lineups of GC-QMS, GC-TQMS, GC-TOFMS and magnetic field type MS to offer the best solution satisfying the customers needs.

29/12/22

Uses of GC-MS Thr

- * GC-MS can be used to study liquid, gaseous or solid samples
- * Analysis of sterols, oils, low chain fatty acids, aroma components and off-flavours
- * Use to detect the contaminants in foods and cosmetics
- * Industrial pollutants may be identified by GC-MS
- * In pharmaceutical industry, pure products can be produced

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LESSON PLAN

① I - M. Sc & B. Sc.

② III. B. Sc

a) Chemical Kinetics, Group theory,
 Electrochemistry - I, II

b) General Chemistry - II

c) Food Chemistry

TIME TABLE

DAY / Period	I	II	III	IV	V
1			III UG	III UG	
2			IT	I UG	
3		II UG LAB			
4	III UG		I PG	I PG	
5					I PG
6	I UG	I PG	IT		I PG

date day hour unit topic Explain.

15-3-23 4 4 5 Electrolyte polarization.

- * no net current flow at equilibrium state
- * disturbance of equilibrium associated with flow of current is called electrolyte polarization the disturbed electrode to be polarized.

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PUDUKKOTTAI - 622 422

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Pudukkottai-622 422.

Title of the Course	GENERAL CHEMISTRY-II	Marks: CIA:25 + EIA:75=100
Category of the Course	Core Course	Per Week: 155
Course Code	UGCH0404	Total Lect. Hrs: 40
Nature of the Course	Skill Based Program	Sem II Credit: 05

Obj	1	2	3	4	5
D1					IU
D2	I	msc. Inorg. Lab			
D3	IU		IP		
D4		IP		IU	
D5	IU		IP		
D6	IP	IU		IP	

I Bsc. chemistry - General chemistry -II (U2R2CHCC4)

I. msc. chemistry - organic Reaction mechanism
Reagents, oxidation Reduction

Inorganic chemistry practical-II
(P2R2CHCC9P)

Date: 12.12.22

Class: I BSc. Chemistry

Topic: General properties of B family

E.C - $ns^2 np^1$

Metallic nature - B - non metal, other metal

Atomic radii - in down group increases

B.P, m.p - decreases

Density - increases

O.S - +1, +3

I.E - decreases in group

Reducing nature - Strong reducing nature

Class: I BSc. Chem

Date: 14.12.22

Topic: Chemical properties of B family

1. Nature of compounds

2. Sum of I.E. high

3. Complex formation

4. Reaction with water

5. Reaction with air

6. with non metal

7. Reaction with acids

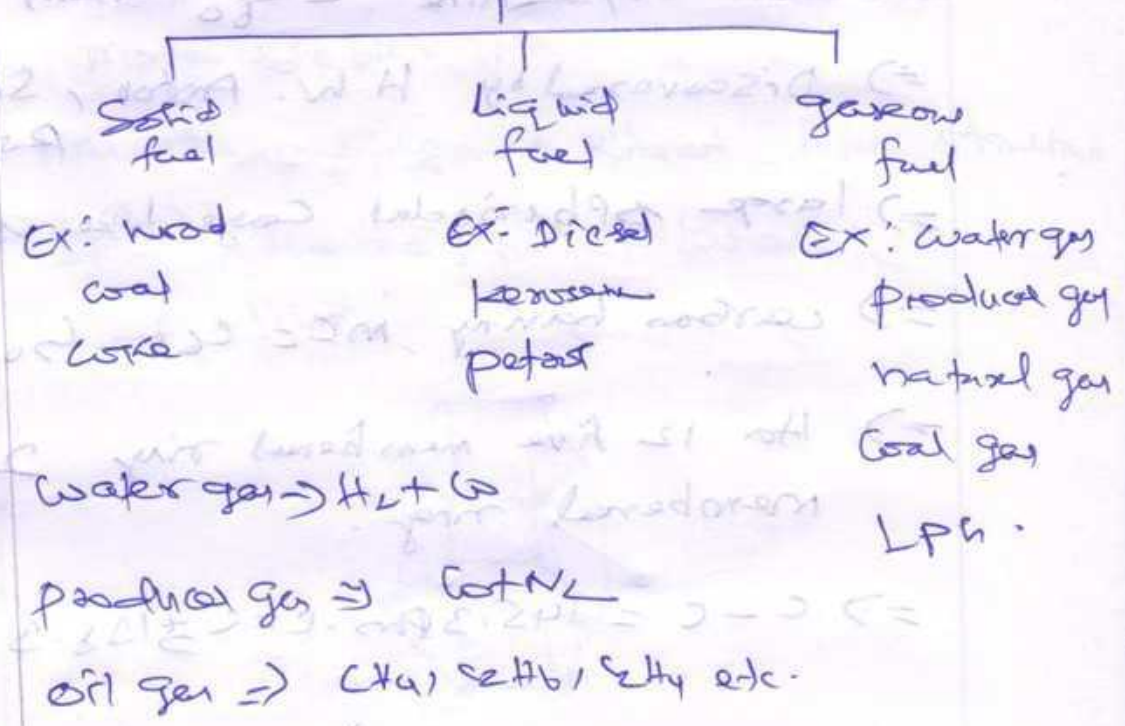
8. Reaction with alkalis

Class: I Bsc. Chemistry

Date: 20.3.23

Topic: Fuels.

Fuels.



[Signature]
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Ms. K. KALACHELVI

Asst. professor in chemistry

J.J. College of Arts and Science (A)
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* Analytical chemistry (U6R1CHMBE3)

* Spectroscopy, Spectrometry } P2R2CHCC6
and their Applications

* Environmental Science U2R2AECC1

DAY	1	2	3	4	5
D1			IUG IT		
D2	IIIUG				IIIU
D3		IPG	IIIUG		IPG
D4	IPG		IIIUG		IIIUG
D5		IPG	IUG IT	IPG	
D6	← Org Lab →				

13.12.22

Q2-I, 10

Storage and Handling of chemicals

* After using a chemical, the container should be tightly closed and returned to its original place.

* Care should be taken to see if all the containers have the appropriate labels stuck to them.

* Corrosive chemicals should be stored in corrosion resistant chambers

* Volatile solvents must be removed by distillation and not by evaporation.

* Only minimum quantity of reagents should be used.

14.12.22

Q3-III

Antidotes, First Aid procedures and calibration

* If a chemical is swallowed immediate treatment should be given to the patient. is called Antidotes.

* Organic substances on the skin

* Acid on clothing

* Alkali on clothing

* Burns in the eyes

* Inhalation of toxic vapours

* Electrical shock

* Heat Burns are caused by hot objects, naked flame, acids, alkalis, bromine, phenol etc.

7.3.23

DS-IV-V

 ^{13}C -NMR

88.8

* In ^{13}C -NMR the chemical shift value upto 0-200 ppm.

* The abundance of ^{13}C is 1.1%. So ^{13}C - ^{13}C is negligible.

* The presence of plane of symmetry in an organic molecule may render some carbons chemically equivalent to others.

* The areas under the peaks in ^{13}C -NMR spectra are not necessarily proportional to the number of carbons giving rise to the signal, therefore one does not consider the area ratios.

14.3.23

DS-II-V

Hetero Nuclear Coupling

* Same type of spin having nuclei
Ex. ^{13}C , ^1H , ^19F , ^31P

CHCl_3

→ Intense signal due to uncoupled hydrogen
→ Wide doublet (satellites) due to coupled hydrogen.

* ^{13}C - ^1H Coupling Constant

used to determine the bond

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particularly in compounds

or Photochemistry
Chemistry concerned
effects of light

S. Kalaiyani

Lesson plan note.

Dec 22 - Apr. 20 23

papers

1. Instrumental methods
of analysis (II H-sc chemistry)
2. Industrial chemistry
(II H-sc chemistry)
3. Physical chemistry - II

D/Hs	I	II	III	IV	V
D1	IPR		IPR		IPR
D2		IPR			
D3	IPR	IPR		IPR	IPR
D4	IPR				IPR
D5	IPR				
D6	IPR		IPR		

Day: D₁

Hrs: 3/5

Date: 12-12-22 Photochemistry - Introduction

⇒ Photochemistry is the branch of chemistry concerned with the chemical effects of light.

⇒ In ordinary chemical reactions that activation energy is supplied by thermal energy such reactions are called Thermal reactions or dark reactions.

⇒ An alternate way in which the necessary activation energy can be acquired is through the absorption of quanta of visible or ultraviolet radiations.

Day: D₂

Hrs: 2

Date: 13-12-22

Lambert - Beer's law

Statement: It states that when a beam of monochromatic radiation is passed through a solution,

the rate of decrease of intensity of the radiation with thickness of the solution is proportional to the intensity of incident radiation as well as concentration of solution.

This law can be mathematically expressed as

$$\left[-\frac{dI}{dz} = k' I C \right]$$

Type: PPT at 10.

Day: D6

Date: 27.12.22

Factors affecting Thermogram

There are some factors which influence the thermogram as.

(i) Heating rate.

(ii) Furnace atmosphere

(iii) Sample geometry

(iv) Sample characteristics

(v) Heat of reaction. Type: P

Day: D1

Date: 28.12.22

Previous years Question discussion

⇒ Discuss the previous Question paper, 2016, 2017, 2018, 2019, 2020, 2021.

⇒ Give the Important two ^{marks} from previous Question paper.

⇒ Solve the problems from previous year Question papers.

⇒ Give the Expected Questions for 2, 5 & 10 marks.

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Lesson plan Note

Unit	Topic	Day
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
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97	97	97
98	98	98
99	99	99
100	100	100

I. Inorganic Chemistry - 100 marks
II. Organic Chemistry - 100 marks
III. Physical Chemistry (Industrial Chemistry) - 100 marks

Date : 12.12.22

Day order : Q1

Topic : Concentration of ores.

The process of removal of the gangue from ore is known as Concentration of ores.

There are numerous methods of concentration and the methods are chosen based on the properties of the ores.

Ores are solid materials from which a pure metal can be obtained. The process of the removal of concentrated material from the ores.

Date : 13.12.22

Day order : Q2

Topic : Magnetic properties of Transition elements.

Characteristics of Transition Metals is their ability to form magnets. Metal complexes that have unpaired electrons are magnetic. Since the last electrons reside in the d orbitals this magnetism must be due to have unpaired d orbitals.

Most of the Transition elements show paramagnetic behaviour. The unpaired electrons in $(n-1)d$ orbitals are responsible.

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LESSON PLAN NOTE

(Even Semester - 2022)
 - 2023

PAPER:

1. Allied chemistry - II - I unit (B.B)
2. Allied chemistry - III - II unit (Phy)
3. Chemistry in every day life - I unit (che)

	1	2	3	4	5
1			phy		
2	phy			Bot	phy
3	Phy	Bot			
4				Bot	Bot
5	← All Lab →			II unit	Bot
6				II unit	II unit

Allied chemistry

(Botany & Biochemistry)

13/12/22
D2

Chromatography

Chromatography is an analytical technique used to the separation of organic and inorganic substance.

Types:

1. Liquid-Solid chromatography (LSC)
2. Gas-Solid chromatography (GSC)
3. Liquid-Liquid chromatography (LLC)
4. Gas-Liquid chromatography (GLC)

→ you tube

14/12/22
D3

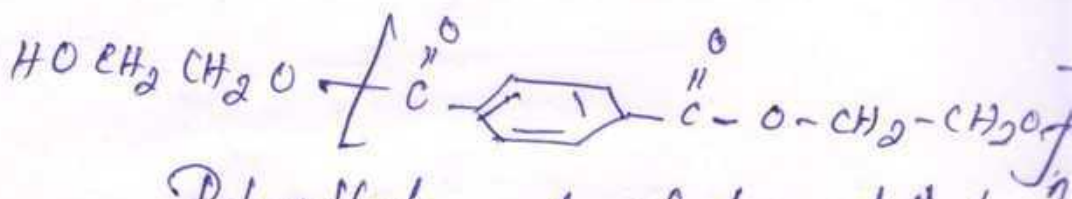
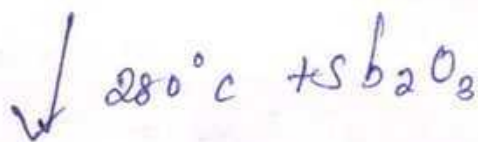
column chromatography

Principle:

Components of a mixture adsorbed as separate bands based on their adsorption ability

2. Procedure:

Silica gel, Cotton, Solvent, Separated band



Polyethylene glycol terephthalate
(Terylene or Dacron)

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