12th STD

CHEMISTRY

12th- CHEMISTRY STUDY MATERIAL

KRISHNAGIRI DISTRICT

2023-2024.

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12TH STD CHEMISTRY - SPECIAL GUIDE

UNIT 1. METALLURGY

2,3 MARK QUESTIONS

1. What are the difference between minerals and ores?

Mineral	Ore
The naturally occurring substance which contain metal in the free state or in the forms of its compounds	An ore is a mineral which contain high percentage of metal which it can be easily and economically extracted.
All minerals are not ores Ex. Clay	All ores are minerals . Ex. Bauxite.

2. Which type of ores can be concentrated by froth flotation method? Give two examples?

- Sulphide ores.
- Ex. Galena, Zinc blende.

3. What are the various steps involved in extraction of pure metals from their ores?

- Concentration of the ore
- Extraction of the crude metal
- Refining of the crude metal.

4. Explain the gravity separation or hydraulic wash process?

- The ore is finely powdered and washed with a current of water.
- The lighter gangue particles are washed away by water.
- Ex. Oxide ores – Haematite.

5. Define slag?

- Flux and gangue are combined to give slag.
- $CaO + SiO_2 \longrightarrow CaSiO_3$

6. Define gangue?

- Non metallic impurity, silicon impurity and rock present in the ore is called gangue.

7. Define concentration?

- The process of removal of the gangue from the impure ore is called concentration.

8. What is the role of sodium cyanide in froth floatation method?

- Sodium cyanide act as a depressing agent which prevents other metal sulphide from coming with the froth.

9. What is the role of cryolite in the extraction of aluminium?

- Lowers the melting point of the mixture.

10. What is the role of limestone in the extraction of iron from its oxide Fe_2O_3?

- Limestone acts as a flux.
- It combines with silica and converted into calcium silicate as slag.
- $CaO + SiO_2 \longrightarrow CaSiO_3$

11. What is the role of Silica in the extraction of copper?

- Silica act as a flux.
- It combines with ferrous oxide and removed as ferrous silicate called as slag.
- $FeO + SiO_2 \longrightarrow FeSiO_3$

12. Describe a method for refining Nickel by Mond's process?

- $Ni + 4\,CO \longrightarrow Ni(CO)_4$ (At 350K)
- $Ni(CO)_4 \longrightarrow Ni + 4\,CO$ (At 460K)

13. How titanium is refined by the Van Arkal method?

- $Ti + 2\,I_2 \longrightarrow TiI_4$ (At 550K)
- $TiI_4 \longrightarrow Ti + 2\,I_2$ (At 1800K)

14. Give the limitations of elingham diagram?

- It does not explains the rate of the reaction
- It does not explain the possibility of the reactions
- When the reactants and the products are in equilibrium the value of ΔG is not true value.

15. Give the uses of zinc?

- Zinc is used in coated on iron to prevent rusting.
- Zinc is used in electrical industries.
- Zinc oxide is used in pharmaceuticals.

16. Define Auto reduction reaction?

- $HgS + O_2 \longrightarrow Hg + SO_2\uparrow$

17. Define Calcination.

- The ore is converted into metal oxide in the absence of oxygen.
- $CaCO_3 \xrightarrow{\triangle} CaO + CO_2$

18. Explain the principle of electrolytic refining with an example.

- Anode – Impure Silver
- Cathode – Pure Silver

- Electrolyte – Silver Nitrate + Nitric Acid
- Pure Silver is deposited at the cathode.

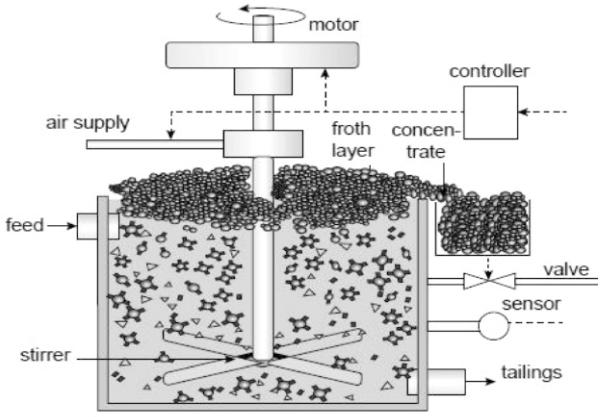
19. What are the conditions for vapour phase refining?

- The metal should form a Volatile compound with the reagent.
- The volatile compound decomposes to give the pure metal.

5 MARK QUESTIONS

1. Explain the froth flotation process?

- Sulphide ores - Galena
- Floating agent - Pine oil
- Collector - Sodium ethyl xanthate
- Depressing agent - Sodium cyanide.
- The ore is finely powdered and mixed with water and pine oil.
- When air is passed it produces froth.
- The ore particles rise to the surface and collected separately.
- The impurities settled at the bottom.



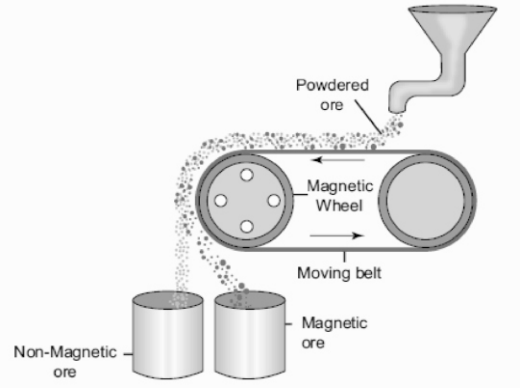
2. Explain zone refining process?

- This method is based on fractional crystallization.
- The impure metal is taken in the form of a rod.
- When the metal rod is heated with a heater the metal melts.
- The heater is slowly moved from one end to the other end.
- The impurity dissolves in the molten zone.
- This process is repeated again and again to get the pure metal.
- Ex. Silicon and Germanium.

3. Explain the magnetic separation process. (how ferromagnetic ores or concentrated?

- This method is used to concentrate ferromagnetic ores.
- Ex. Tin stone.
- The powdered ore is added on an electro magnet containing a moving belt on a magnetic rollers.

- The magnetic ores fall near the magnet.
- The non magnetic parts fall away from the magnet.



4. Electro chemical extraction of aluminium by Hall-Heroult process?

- Anode – Carbon rod
- Cathode - Iron tank coated with carbon.
- Electrolyte – Calcium chloride, Alumina.
- Temperature – 1270K
- Pure Aluminium is deposited at cathode
- $Al_2O_3 \longrightarrow 2\ Al^{3+} + 3\ O^{2-}$
- $2\ O^{2-} \longrightarrow O_2 + 4\ e^-$
- $Al^{3+} + 3\ e^- \longrightarrow Al$

UNIT 2. P - BLOCK ELEMENTS - I

2,3 MARK QUESTIONS

1. The first element of p-block show anamolous properties. Give reason (or) write reason for anamolous behaviour of Nitrogen.

- Small size
- High ionisation enthalpy and high electronegativity.
- Absence of d orbitals in the valence shell.

2. Give the uses of silicones.

- Making water proof clothes.
- Used as insulating material in electrical motor.
- Used in high temperature oil baths and in vacuum pumps.

3. Give the uses of Borax (or) Boric acid.

- Used to prepare Enamels and Glass.
- Used as preservative.

4. What are the uses of potash alum.

- Used for purification of water.
- Used in dyeing and paper industries.
- Used to arrest bleeding.

5. Write a note on fisher Tropsch synthesis.

- Carbon monoxide reacts with hydrogen at 500K - 700K and 50 atm to give hydro carbons.
- $n\ CO + 2\ nH_2 \rightarrow C_nH_{2n} + n\ H_2O$

6. How will you identify borate radical? (or) What is Ethyl Borate test?

- When boric acid is heated with ethyl alcohol and conc. Sulphuric acid, an ester triethyl borate (green edged flame) is formed.
- $H_3BO_3 + 3\ C_2H_5OH \xrightarrow{conc.H_2SO_4} B(OC_2H_5)_3 + 3\ H_2O$

7. What is catenation? Write the condition for catenation property of Carbon.

- Catenation is ability of an element to form chain of atoms.
- Valence is greater than two.
- Element should have ability to bond with itself.
- Self bond should be a strong bond.

8. Describe allotropism in p-block elements with reference to carbon.

- Some elements have different crystalline forms but same physical state.
- Ex. Carbon exists as diamond and graphite.

9. CO (carbon Monoxide) is a reducing agent. Explain.

- $3\ CO + Fe_2O_3 \rightarrow 2\ Fe + 3\ CO_2$

10. How will you convert boric acid to boron nitride?

- Boric acid + ammonia $\xrightarrow{800 - 1200K}$ Boron nitride + Water

11. Give one example for each of the following?

(i) Icosagens (ii) tetragen (iii) Pnictogen (iv) chalcogen.

(i) Boron, B
(ii) Carbon, C
(iii) Nitrogen, N
(iv) Oxygen, O

12.Explain Hydro Boration

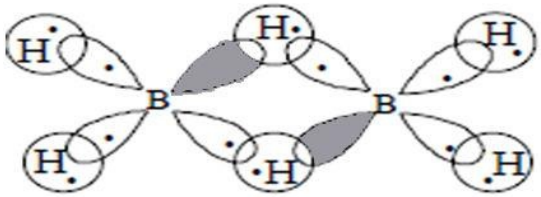
- The addition of Diborane with alkenes in the presence of Ether at room temperature is called as Hydro Boration.
- $B_2H_6 + 6RCH{=}CHR \longrightarrow 2B(RCH\text{-}CH_2R)_3$

5 MARK QUESTIONS

1. What are the difference between graphite and diamond?

S.No	Graphite	Diamond
1.	It is soft	It is hard
2.	Sp^2 hybridised	Sp^3 hybridised
3.	Conduct electricity	Do not conduct electricity
4.	It has free electrons	It has no free electrons
5.	Hexagonal sheet shape	Tetrahedron shape.

2. Explain the structure of Diborane.



- The two BH_2 units are linked by two Hydrogen Bridges.
- It has Eight B-H bonds and 12 Valence electrons.
- The Four B-H bonds are normal covalent bonds. (2c-2e- bond)
- Remaining four electrons are used to form two Bridge B-H-B bonds.
- It is called as Three center two electron bond.
- The Boron atom is sp^3 hybridised.

3. Write a note on Zeolites.

- They are three dimensional crystalline solids.
- Contain Al, Si and oxygen.
- They are Sodium alumina Silicates.
- They have porous structure where sodium ions and water molecules are loosely held.
- They have honey comb structure with tunnels and cages.

UNIT 3. P- BLOCK ELEMENTS - II

2,3 MARK QUESTIONS

1. What is inert pair effect?

- In p-block, the outer s-electrons become chemical inert and do not take part in bonding. This is called inert pair effect.

2. Give the uses of Helium.

- Helium Oxygen mixture is used to prevent Bends during deep sea diving.
- Helium is used in filling balloons.
- Helium is used in low temperature science.

3. Give the uses of argon.

- Prevents oxidation of hot filament.
- Increase the life of bulbs.

4. List the uses of Krypton

- Used in Flash bulbs
- Krypton lamps pass through dense fog so used in Airports.

5.List the uses of Radon

- Used as source for Gamma rays
- Radon capsules destroy cancer cells.

6. List the uses of Xenon

- Used in Flashbulbs and Lasers
- Used in Flash bulbs by Photographers.

7. List the uses of Neon

- Used in advertisement as Neon signs with brilliant red colour

8. Give the uses of phosphine.

- Used as smoke screen.
- Used as Holmes signal.

9. Give the uses of sulphuric acid.

- Used to prepare fertilizers.
- Used as drying agent.
- Used to prepare pigments.

10. Give a reason to support that Sulphuric acid is a dehydrating agent.

- $HCOOH + H_2SO_4 \longrightarrow CO + H_2SO_4 . H_2O$

11. Explain why fluorine always exhibit an oxidation state of -1?

- Small Size
- High electronegativity and high electron affinity
- High electron charge density.

12. What are interhalogen compounds? Give examples.

- Each halogen combines with other halogens to form interhalogen compounds.
- Ex. IF_7.

13. Why fluorine is more reactive than other halogens?

- F - F bond dissociation energy is very low.
- Small size.
- High electro negativity and high electron affinity

14. What is the hybridisation of iodine in IF_7 ? Give its structure.

- Hybridisation is Sp^3d^3.
- Shape is pentagonal bipyramidal.

15. Why HF is a weak acid but other acids are strong acids?

- H-F bond energy is very high.
- Fluorine has high electro negativity and high electron affinity

16. What happens when PCl_5 is heated?

- $PCl_5 \xrightarrow{\Delta} PCl_3 + Cl_2$

17. How is bleaching powder prepared?

- Calcium hydroxide + Chlorine gas ------> bleaching powder + Water
- $Ca(OH)_2 + Cl_2 \longrightarrow CaOCl_2 + H_2O$

18. Write a test for sulphate or Sulphuric acid.

- $BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + 2\,HCl$ (White ppt)

19. What is the hybridisation and structure of Inter halogen compounds?

Type	Hybridisation	Structure
AX	Sp^3	Linear
AX_3	Sp^3d	T Shaped
AX_5	Sp^3d^2	Square pyramidal
AX_7	Sp^3d^3	Pentagonal bi pyramidal

20. Find the Oxidation states of the Halogen in the following.

a) OF_2

$(+2) + 2F = 0$
$F = -2/2$
$= -1$

b) O_2F_2

$(+1\times2) + 2x = 0$
$2x = -2$
$F = -2/2$
$= -1$

c) Cl_2O_3

$(-2\times3) + 2x = 0$
$2x = 6$
$X = 6/2$
$= +3$

d) I_2O_4

$(-2\times4) + 2x = 0$
$2x = 8$
$X = 8/2$
$= +4$

20. Explain Deacon's process for manufacture of Chlorine.

$$4HCl + O_2 \xrightarrow[Cu_2Cl_2]{400^0C} 2H_2O + 2Cl_2 \uparrow$$

21. Chalcogens belongs to p-block. Give reason.

- Last electron enters into p subshell $ns^2\,np^4$

5 MARK QUESTIONS

1. What are the differences between white phosphorus and red phosphorus.

S.No.	White Phosphorus	Red Phosphorus
1.	Poisonous	Non – poisonous
2.	Garlic Smell	No smell
3.	Glow in dark. (Phosphorescence)	No Phosphorescence.
4.	Tetrahedral Structure	Linear Polymeric Structure
5.	Burn at low temperature.	Not burn at low temperature.

2. What are the Properties of inter halogen Compounds.

- The central atom must be large.
- Formed only between two halogens.
- Fluorine can not act as central atom.
- Undergo auto ionization
- Strong oxidizing agents.

UNIT 4. TRANSITION AND INNER-TRANSITION ELEMENTS

2,3 MARK QUESTIONS

1. What are transition metals. Give examples.

- Elements from group 3 -12.
- Ex. Gold, Silver, Copper

2. d-block elements show variable oxidation states. Why?

- Energy difference between (n-1)d and ns orbital is very small.

3. Transition metals show high melting points. Why?

- Strong inter atomic attraction.
- Strong metallic bonds.

4. Why transition metals form alloys?

- They are similar in size.
- One metal atom can easily replace the crystal lattice of another metal atom.
- Ex. Au – Cu alloy.

5. Explain the Hume – Rothery rules for the formation of alloy.

- The difference in the atomic radius should be lesser than 15%.
- The difference in the electro negativity should be zero.
- They should have same crystalline structure and valence.

6. Why transition metals form complexes?

- Smaller size.
- High positive charge.
- Vacant (n-1)d orbitals.

7. What are interstitial compounds?

- When atoms like hydrogen, nitrogen are trapped in the interstitial holes of the metal lattice are called interstitial compounds.
- Ex. TiC

8. Give the characteristics of interstitial compounds?

- They are hard.
- They have good electrical and thermal conductivity
- They have high melting point.

9. Write the electronic configuration of Cr and Cu.

- $_{24}Cr$ - [Ar] $4s^1\ 3d^5$
- $_{29}Cu$ - [Ar] $4s^1\ 3d^{10}$

10. Why Cu^{2+} is coloured but Zn^{2+} is colourless?

- Zn^{2+} - [Ar] $3d^{10}$- No single electron - No d-d transition - colourless.
- Cu^{2+} - [Ar] $3d^9$ - Has single electron - d-d transition - coloured.

11. Which is a strong reducing agent. Cr^{2+} or Fe^{2+} ?

- E^o of Cr^{2+} = - 0.91 V
- E^o of Fe^{2+} = - 0.44 V
- E^o value is greater negative the metal is a powerful reducing agent. So Cr^{2+} is a strong reducing agent.

12. Which is stable Fe^{2+} or Fe^{3+} ?

- Fe^{2+} : [Ar] $3d^6$
- Fe^{3+} : [Ar] $3d^5$
- Fe^{3+} is more stable. It is having half filled $3d^5$ electronic configuration.

13. What are actinides, give examples.

- 5 f block elements.
- The 14 elements from Th to Lr.
  Ex. Th, Lr, U

14. Explain the oxidation states of Lanthanides and actinides.

oxidation states	Lanthanide	Actinide
Common oxidation state	+3	+3
Other oxidation states	+2, +4	+4, +5, +6, +7

15. Explain the chromyl chloride test.

- Potassium di chromate + chloride salt + conc. sulphuric acid -----> Chromyl Chloride (Red orange vapour).

$$K_2Cr_2O_7 + 4NaCl + 6H_2SO_4 \rightarrow 2CrO_2Cl_2 + 2KHSO_4 + 4NaHSO_4 + 3H_2O$$

16. Out of $Lu(OH)_3$ and $La(OH)_3$ which is more basic. Why?

- La^{+3} ion is larger than Lu^{+3}, due to Lanthanide contraction.
- When the ionic radius increases, the basic character also increases.
- So $La(OH)_3$ is more basic.

17. Why Zirconium and Hafnium is have similar properties?

- Because of Lanthanide contraction

5 MARK QUESTIONS

1. Compare Lanthanides and Actinides.

S.No.	Lanthanides	Actinides
1.	Electrons enter in the 4f orbitals.	Electrons enter in the 5f orbitals.
2.	Binding energy of 4f orbital is high.	Binding energy of 5f orbital is low.
3.	They do not form complexes	They form complexes
4.	They are colourless	They are coloured
5.	They do not form oxocation.	They form oxocation.

2. Explain Lanthanide contraction.

Lanthanide contraction :

- The ionic radius of M^{3+} ions from La to Lu decreases.

Reason :

- Imperfect shielding of 4f orbitals.

Causes :

- Ionic radius decreases.
- Basicity decreases
- Covalent character increases
- They have similar chemical properties
- The second and third transition series have similar properties.

UNIT 5. CO-ORDINATION CHEMISTRY

2,3 MARK QUESTIONS

1. Differentiate double salt and Co-ordination compounds.

S.No.	Double Salt	Co-ordination compounds
1.	It dissociate into simple ions.	It never dissociates into simple ions.
2.	The ions loses its identify.	The ions does not lose its identify.
3.	It contains cation and anion.	It consists of a complete ion.
4.	Ex. FAS	Ex. $K_4[Fe(CN)_6]$

2. Classify the following ligand based on the number of donor atoms.

(a) NH_3 (b) en (c) OX^{2-} (d) Pyridine

Ligand	Number of donor atoms	Type of Ligand
NH_3	1	Monodentate
En	2	Bidentate
OX^{2-}	2	Bidentate
Pyridine	1	Monodentate

3. What are the limitations of Werner's theory.

- It fails to explain the colour and magnetic properties.

4. What are the limitations of valence bond (VB) theory.

- It fails to explain the colour of the complex
- It fails to explain the inner orbital and the outer orbital complexes of the same metal.
- It considers only the spin of the magnetic moments, does not consider the other components.

5. Define crystal field stabilisation Energy (CFSE)

- The energy difference between the electronic configuration of the ligand field and the Bary center.

6. $[T_i (H_2O)_6]^{3+}$ is coloured white $[Sc(H_2O)_6]^{3+}$ is colourless· Why?

- Sc^{3+} - $3d^o$- No single electron – No d -d transition – colourless
- Ti^{3+} - $3d^1$- Has single electron- d-d transition – coloured.

7. Write down the uses of Co-ordination complexes medicinal use?

- Cis - platin - To cure cancer
- Haemoglobin - Fe^{2+} - Porphyrin complex carrier O_2 from lungs to tissues.
- Chlorophyll - Mg^{2+} - Porphyrin complex helps in photo synthesis.

5 MARK QUESTIONS

1.Explain werners theory of co-ordination Compounds.

- There are two types of Valency of metal ions.

Primary Valency	Secondary Valency
Oxidation number of the metal atom.	Co-ordination number of the metal atom.
Ionisable	Non-ionisable
Non-directional	Directional
Satisfied only by negative ions.	Satisfied by positive, negative ions and neutral molecules.

- The inner sphere is called Co-ordination sphere. The groups present in this sphere are firmly attached to the metal.
- The outer sphere is called Ionisation sphere. The groups present in this sphere are loosely attached to the metal.

2. What are the assumptions of Valance bond theory (VBT)

- The ligand –metal bond is a covalent bond .
- The central metal atom contains vacant d-orbitals.
- The hybridised vacant metal orbital overlap with the filled ligand orbitals to form metal ligand co-ordinate covalent bonds.
- The hybridised orbitals are directional in space.
- Co-ordination No.2 - sp Hybridisation – Linear.
- Central metal atom with unpaired electrons- paramagnetic. paired electrons – diamagnetic
- In octahedral, (n-1)d Orbital - low spin complex, nd Orbital - high spin complex.

3. Define structural isomerism and its types?

Linkage Isomerism :

- When an ambidentate ligand is bonded by two different donor atoms to the central metal are called linkage isomerism.
- $[Cr(H_2O)_5NO_2]$ Br and $[Cr(H_2O)_5$ ONO] Br

Co-ordination Isomerism :

- The interchange of one or more ligands between the cationic and the anionic complex.
- $[Co(NH_3)_6]$ $[Cr(CN)_6]$ and $[Cr(NH_3)_6]$ $[Co(CN)_6]$

Ionisation Isomerism :

- When a simple ion acts as a ligand and exchanges with one or more ligand present in the co-ordination sphere is called ionisation isomerism.
- $[Co(H_2O)_5Cl]$ Br and $[Co(H_2O)_5$ Br] Cl

Solvate or Hydrate isomerism :

- When solvent molecules like water are exchanged by the ligands in the co-ordination compounds is called as solvate isomerism.
- $[(Cr(H_2O)_6]$ Cl_3 and $[Cr(H_2O)_5Cl]$ Cl_2 .H_2O

UNIT 6. SOLID STATE

2,3 MARK QUESTIONS

1. Define Unit Cell.

- The basic repeating Structural unit of a crystal is called Unit cell.

2. What are the characteristic of ionic Crystals?

- They are hard.
- They do not conduct electricity in the solid state.
- They conduct electricity in the molten state.
- They have high melting points.

3. What are the different types of Primitive Unit cells.

- (i) Cubic (ii) Tetragonal (iii) Orthorhombic (iv) Hexagonal (v) Mono clinic (vi) Triclinic (vii) Rhombohedral.

4. Define coordination number of a crystal. What is the co ordination number of atoms in BCC?

- The number of nearest neighbours that is surrounding an ion in a crystal is called as coordination number.
- For BCC it is 8.

5. Define molecular crystals.

- The neutral molecule occupies in the lattice point of crystal.
- They have vander waals forces.
- Ex. Ice.

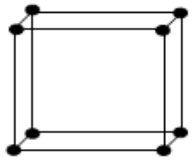
6. Explain the types of molecular crystals?

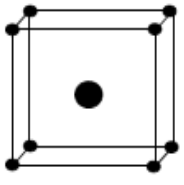
- Non-polar molecular crystals –Weak London forces – Ex. Naphthalene
- Polar molecular crystals –Dipole- Dipole interactions -Ex. Solid CO_2
- Hydrogen bonded molecular crystals –Hydrogen bonds - Ex. Ice

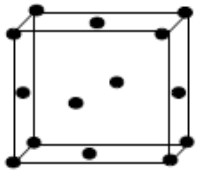
7. Draw the structures of the following ;

1.SC: **2.BCC:** **3.FCC:**

- Total No of atoms in SC: 1
- Total No of atoms in BCC : 2
- Total No of atoms in FCC : 4







8. What is Braggs equation?

- $n\lambda=2d\sin\theta$
- n = order of reflection
- λ = wavelength of X-rays
- θ = angle of reflection
- d = inter planar distance.

9.Differentiate Isotropy and Anisotropy.

Isotropy	Anisotropy
When the physical properties are identical in all directions. Ex. Rubber	When the physical properties are not identical in all directions. Ex. NaCl

10. Define packing efficiency?

- Packing efficiency = $\frac{\text{Total volume occupied by the spheres}}{\text{Volume of the unit cell}} \times 100$

11. Define crystal lattice.

- The regular arrangement of the ions in a crystal is called as crystal lattice.

5 MARK QUESTIONS

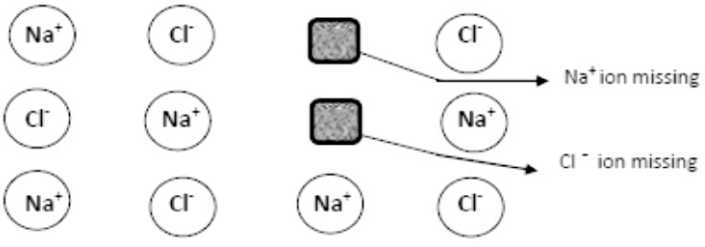
1. Give the different between crystalline and Amorphous solids.

S.No.	Crystalline solids	Amorphous solids
1.	Orderly arrangement of atoms	Random arrangement of atoms
2.	Definite shape	Irregular shape.
3.	Anisotropic	Isotropic
4.	True solids	Super cooled liquids
5.	Definite heat of fusion	Heat of fusion is not definite
6.	Ex : Nacl, Diamond	Ex ; Rubber, Glass

2.Explain the schottly defect and frenkel defect ;

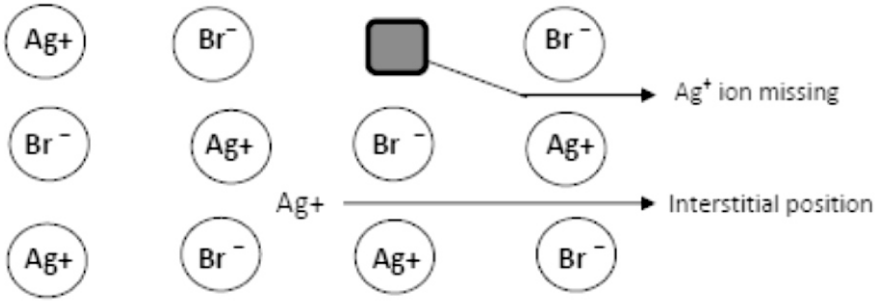
Schottly defect :

- It takes place due to the missing of equal number of Anion and cation from the crystal lattice. Ex. NaCl
- The cation and Anion should be similar in size.
- Schottky defect will decrease the density of the crystal.
- This effect does not change the stoichiometry.



Frenkel defect:

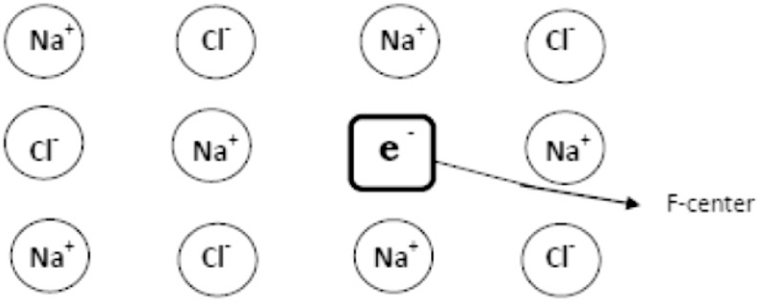
- It takes place due to the dislocation of ions from the crystal lattice. Ex. AgBr
- The cation and the Anion should be different in size.
- Frenkel defect does not decrease the density of the crystal.
- This effect does not change the stoichiometry.



3. Explain the metal excess and metal deficiency defect .

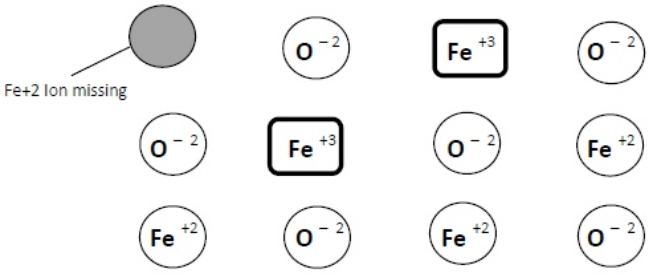
Metal excess defect:

- When the metal ions present more than the anions. Ex. NaCl
- The electrical neutrality is maintained by the presence of a extra electron in the interstitial position.



Metal deficiency defect :

- When the metal ions present lesser than the anions. Ex. FeO
- Fe^{2+} is missing from the crystal lattice.
- To maintain electrical neutrality two Fe^{2+} ion oxidises to Fe^{3+} ion.



UNIT 7. CHEMICAL KINETICS

2,3 MARK QUESTIONS

1. Define Rate Law.

- It relates the rate, the rate constant and the concentration of the reactants.

2. Define Instantaneous rate.

- The rate of reaction at a particular instant during the reaction.

3. Define Average rate.

- The change in concentration of reactants at a given interval of time in a chemical reaction.

4. Define Elementary reaction.

- Each and every single step in a reaction mechanism is called Elementary reaction.

5. Give some examples for first order reaction.

- Decomposition of Dinitrogen pentoxide
- Decomposition of Thionyl chloride.
- Decomposition of Hydrogen peroxide.

6. Differentiate rate of a reaction and Rate constant.

S.No.	Rate of a reaction	Rate constant
1.	It is the speed at which the reactants are converted into products.	It is a Proportionality constant.
2.	It is measured as the decrease in the concentration of the reactant	It is equal to the rate of the reaction. When the concentration of the reactants are unity.
3.	It depends on the initial concentration of the reactant	It does not depends on the initial concentration of the reactant.

7. Differentiate order of a reaction and molecularity.

S.No.	Order of a reaction	Molecularity
1.	It is the sum of the powers of the concentration terms present in the rate law.	It is the total number of reactants present in the elementary step.
2.	Its value can be zero, fraction or a integer.	Its value is always a whole number and cannot be zero.
3.	It assigned for the overall reaction.	It assigned for each elementary step of the mechanism.

8. Define Pseudo first order reaction Give Example.

- By taking one of the reactant concentration in excess, a second order reaction can be converted to first order reaction.
- Ex. Acid hydrolysis of Ester.

9. Give some examples for zero order reaction.

- Decomposition of Nitrous oxide in the presence of platinum.
- Photo chemical reaction between H_2 and I_2.
- Iodination of acetone in acid medium.

10. Define Half life period.

- The time required to convert the initial reactant concentration by one half is called half life period.
- $t_{1/2} = \frac{0.693}{k}$ sec.

11. Define Activation energy.

- The minimum energy required by the molecules to react and form the products is called Activation energy.

12. Write the Arrhenius equation.

- $K = Ae^{-Ea/RT}$
- K = Rate constant
- Ea - Activation energy
- A = frequency factor
- R - Gas constant
- T = Temperature.

13. Define Order of a reaction.

- It is the sum of the powers of the concentration terms present in the rate law.

14. Define Molecularity.

- It is the total number of reactants present in the elementary step.

15. Define Rate of a reaction.

- The change in the concentration of the reactant in a chemical reaction per unit time.

16. Define Rate constant.

- It is equal to the rate of the reaction when the concentration of the reactants are unity.

UNIT 8. IONIC EQUILIBRIUM

2,3 MARK QUESTIONS

1. Explain the Arrhenius concept of acids and bases?

- An acid dissociates to give hydrogen ions in water. Ex. HCl
- A base dissociates to give hydroxyl ions in water. Ex. NaOH

2. Limitations of Arrhenius concept?

- It fails to explain the behaviour of acids and bases in non aqueous solution like acetone.
- It fails to explain the basicity of ammonia.

3. What are Lewis acids and bases? Give two examples?

- Acid – electron pair acceptors. Ex. BF_3 • Base - electron pair donors. Ex. NH_3

4. Discuss the lowry bronsted concept of acids and bases?

- Acid - proton donors. Ex. HCl • Base - proton acceptor. Ex. NH_3

5. Define conjugate acid – base pairs?

- Chemical species that differ only by a proton are called conjugate acid-base pairs.

6. List the difference between Lewis acid and Lewis base Lewis base?

S.No.	Lewis acid	Lewis base
1.	Electron deficient molecules	Molecules with lone pairs of electrons.
2.	All metal ions	All anions.
3.	They contains polar double bonds. Ex. BF_3, $AlCl_3$	They contain carbon carbon double bond. Ex. NH_3, H_2O

7. Explain commonion effect? Write examples?

- When a salt of weak acid is added to the acid, the dissociation of the weak acid decreases.
- Ex. Sodium acetate is added to acetic acid the dissociation of acetic acid decreases.

8. Define Ostwald dilution law?

- It relates the dissociation constant of weak acid with its degree of dissociation and the concentration of the weak acid.
- $K_a = \frac{\alpha^2 C}{1-\alpha}$

9. Define a buffer solution?

- A mixture of weak acid and its conjugate base or
- A mixture of weak base and its conjugate acid.
- Ex. 1. Acetic acid + Sodium acetate
  2.Ammonium hydroxide + Ammonium chloride.

10. What is ionic product of water of water and give its value at room temperature?

- The products of molar concentration of hydronium and hydroxyl ions in pure water.
- At 25^0 C
- $K_w = [H_3O^+]\ [OH^-]$
- $K_w = 1 \times 10^{-14}\ mol^2\ dm^{-6}$

11. Define pH?

- The negative logarithm of base 10 of the molar concentration of the hydronium ions present in the solution.
- $pH = -\log [H_3O^+]$

12. What is the relation between pH and pOH?

- $pH = -\log_{10} [H_3O^+]$ • $pOH = -\log_{10} [OH^-]$
- $pH + pOH = -\log_{10} [H_3O^+] - \log_{10} [OH^-]$ • $pH + pOH = 14$

13. Define solubility product?

- Solubility product is the product of the molar concentration of the ions raised to the power of its stoichiometric co efficient in a balanced equilibrium equation.

5 MARK QUESTIONS

1. Drive and expression for Ostwald dilution law?

$$CH_3COOH \rightleftharpoons H^+ + CH_3COO^-$$

$$k_a = \frac{[H^+][CH_3COO^-]}{[CH_3COOH]}$$

$$k_a = \frac{(\alpha C)(\alpha C)}{(1-\alpha)C}$$

$$k_a = \frac{\alpha^2 C}{1-\alpha}$$

$$K_a = \alpha^2 C$$

$$\alpha = \sqrt{\frac{K_a}{C}}$$

$$[H^+] = \alpha C$$

$$[H^+] = \sqrt{K_a C}$$

$$\alpha = \frac{\text{Number of moles dissociated}}{\text{total number of moles}}$$

2. Derive the Handerson Hasselbalc equation?

$$[H_3O^+] = K_a \frac{[acid]}{[base]}$$

$$[H_3O^+] = K_a \frac{[acid]}{[salt]}$$

$$-\log [H_3O^+] = -\log K_a - \log \frac{[acid]}{[salt]}$$

$$pH = -\log [H_3O^+] \text{ and } pK_a = -\log K_a$$

$$\Rightarrow pH = pK_a - \log \frac{[acid]}{[salt]}$$

$$\Rightarrow pH = pK_a + \log \frac{[salt]}{[acid]}$$

UNIT 9. ELECTRO CHEMISTRY

2,3 MARK QUESTIONS

1. Define Specific Conductance.

- The conductance of a 1meter cube of an electrolytic solution.

2. Define molar Conductance.

- The conductance of one mole of an electrolytic solution. $Sm^2.mol^{-1}$
- $\Lambda m = k \times \frac{10^{-3}}{M}$ $Sm^2\ mol^{-1}$

3. Define Equivalent conductance.

- The conductance of one gram equivalent of an electrolytic solution.
- $\Lambda m = K \times \frac{10^{-3}}{N}$ $Sm^2\ g.eq^{-1}$

4. State Kohlraush law.

- At infinite dilution the limiting Molar conductivity of an electrolyte is equal to the sum of the limiting molar conductance of its constituent ions.

5. What are the applications of Kohlraush law.

- To Calculate the molar conductance of a weak electrolyte at infinite dilution.
- To calculate the degree of dissociation of weak electrolyte
- To calculate the solubility of sparingly soluble salts.

6.State Faraday's laws of electrolysis.

First law:

- The mass of the substance liberated at electrode is directly proportional to the quantity of charge passed.
- $M \propto Q$

Second law:

- When the same amount of current is passed through the different electrolytes, the mass of substance liberated at electrode are directly proportional to their electrochemical equivalence.

7. Define electrochemical equivalent

- The mass of substance deposited by a charge of 1 coulomb.

8. Write a note on sacrificial protection.

- Sacrificial anode : Zinc
- Cathode : Iron
- Zinc is corroded and Iron is protected.

9. Explain the factors affecting electrolytic conductance .

- Temperature increases, conductance will increases.
- Dilution increases, the molar conductance also increases.
- Viscosity decreases, conductance will increases.

10. Define anode and cathode.

S.No.	Anode	Cathode
1.	Oxidation takes place	Reduction takes place
2.	Donates electrons	Accepts electrons
3.	Negative end	Positive end

11. Why does conductivity of a solution decrease on dilution of the solution?

- On dilution the number of ions per cm3 decreases.

12. Why is AC current used instead of DC in measuring the electrolytic conductance?

- AC Current is used to prevent Electrolysis of the solution.

5 MARK QUESTIONS

1. Explain the Galvanic cell notation.

- Single vertical bar represents a phase boundary and double vertical bar represents the salt bridge.
- The anode half cell is written on the left and the cathode half cell is written on the right side of the salt bridge.
- The anode written on the extreme left and cathode written on the extreme right.
- The emf of the cell is written on the right side after cell diagram.

2. Derive an expression for Nernst equation.

$$xA + yB \rightleftharpoons lC + mD$$

$$Q = \frac{[C]^l\ [D]^m}{[A]^x\ [B]^y}$$

$$\Delta G = \Delta G^\circ + RT \ln Q$$

$$\Delta G = -nFE_{cell} \quad ; \Delta G^\circ = -nFE^\circ_{cell}$$

$$-nFE_{cell} = -nFE^\circ_{cell} + RT \ln \frac{[C]^l[D]^m}{[A]^x\ [B]^y}$$

$$E_{cell} = E^\circ_{cell} - \frac{2.303RT}{nF} \log \frac{[C]^l[D]^m}{[A]^x\ [B]^y}$$

3. Explain the function of H_2 - O_2 fuel cell.

- Fuel / Electrode / Electrolyte / Electrode / Oxidant
- Fuel : Hydrogen
- Oxidant : Oxygen
- Electrolyte : aqueous KOH
- Inert electrode : Graphite with Ni and NiO
- Anode : $2\ H_2 + 4\ OH^- \longrightarrow 4\ H_2O + 4\ e^-$
- Cathode : $O_2 + 2\ H_2O + 4\ e^- \longrightarrow 4\ OH^-$
- Overall reaction : $2\ H_2 + O_2 \longrightarrow 2\ H_2O$.

UNIT 10. SURFACE CHEMISTRY

2,3 MARK QUESTIONS

1. What is Positive Catalyst? Give an example.

- A Catalyst which increases the. rate of reaction.
- Ex. In Haber process of the manufacture of NH_3 ,Fe act as a positive catalyst.

2. What is Negative Catalyst ? give an example.

- A Catalyst which decreases the rate of reaction.
- Ex. In the decomposition of H_2O_2, glycerol act as a negative catalysts.

3. What are Auto Catalyst? Give an example.

- When the product formed acts as a catalyst.
- Ex. In the decomposition of AsH_3, As act as a auto catalyst.

4. What are promoters? Give an example.

- The substance which increases the activity of a catalyst.
- Ex. In Haber process of the manufacture of NH_3, Mo acts as a promoter.

5. What are catalytic poisons? Give an examples.

- The substance which decreases the activity of a catalyst.
- Ex. In Haber process of the manufacture of NH_3, H_2S acts as catalytic poison.

6. What are lyophilic colloids? Give an examples.

- Definite attractive force exists between dispersed phase and dispersion Medium.
- Ex. Sol of starch.

7. Where are lyophobic colloids? Give an example.

- No attractive force exists between dispersed phase and dispersion Medium.
- Ex. Sol of Gold.

8. What is Peptization? Give an example.

- By addition of suitable electrolytes, precipitated particles can be brought into colloidal state.
- Ex. AgCl (Precipitate) $\xrightarrow{HCl}$ AgCl (Colloid)

9. What is Tyndall effect?

- The scattering of light by the sol particle is called Tyndall effect.

10. What is Brownian Moment?

- The colloidal particles move in a zig zag, random, ceaseless motion is called brownian moment.

11. What is electrophoresis?

- The movement of sol particles under the influence of electric field is called electrophoresis.

12. What is electro Osmosis?

- The movement of dispersed medium under the influence of electric field is called electro osmosis.

13. What is coagulation?

- The flocculation and setting down of the sol particles is called Coagulation.

14. What are Emulsions? Give an examples.

- Emulsions are colloidal solution in which a liquid is dispersed in an another liquid.
- Ex. Milk

15. Write the Medicinal uses of Colloids.

- Colloidal Gold and Calcium - tonics
- Milk of Magnesia - stomach troubles
- Silver sol (Argyrol) - Eye lotion

16. What happens when a colloidal sol of $Fe(OH)_3$ and As_2S_3 are mixed?

- On mixing positive sol $Fe(OH)_3$ and a negative sol As_2S_3 mutual coagulation occurs and cause precipitation

17. What is the difference between a sol and a gel?

S.No	Sol	Gel
1.	Phase – solid	Phase – liquid
2.	Medium – liquid	Medium – solid
3	Ex. Ink	Ex. Butter

18. Addition of Alum purifies water. Why?

- The Al^{3+} ions present in the alum forms coagulation of suspended impurities.

5 MARK QUESTIONS

1. Differentiate Physisorption and Chemisorption.

S.No	Physical adsorption	Chemical adsorption
1.	It is instantaneous	It is very slow
2.	It is non-specific	It is very specific
3.	Multilayer adsorbate is formed.	Monolayer adsorbate is formed.
4.	Heat of adsorption is low	Heat of adsorption is high
5.	No transfer of electrons.	transfer of electrons.

2. Describe Characteristics of Catalysts.

- Catalyst is needed in small quantity.
- Catalyst cannot start a reaction.
- Specific in nature.
- Highly effective at the optimum temperature.
- More effective in a finely divided from.

3. Explain intermediate compound formation theory of Catalysis?

- Reactant + catalyst $\longrightarrow$ intermediate compound.
- Intermediate compound + Reactant $\longrightarrow$ Product + Catalyst.

- $2\,SO_2 + O_2 \xrightarrow{NO} 2\,SO_3$
- $2\,NO + O_2 \rightarrow 2\,NO_2$
- $NO_2 + SO_2 \rightarrow SO_3 + NO$

4. Explain adsorption theory of catalysis.

- Reactant molecules diffuse from bulk to the Catalyst surface.
- The reactants are adsorbed on the surface of the catalyst.
- The adsorbed reactants form activated complex Which is decomposed to form the products.
- The product molecules are desorbed.
- The products diffuse away from the surface of the Catalyst.

5. Explain the Preparation of colloids by condensation method (Chemical method)?

- Oxidation
- Reduction
- Hydrolysis
- Double decomposition
- Decomposition

6. Define Homogeneous and Heterogeneous catalysis.

Homogeneous catalysis:

- when the catalyst, reactant and products are in the same phase.

$$2SO_{2(g)} + O_{2(g)} \xleftrightarrow{NO(g)} 2SO_{3(g)}$$

Heterogeneous catalysis:

- when the catalyst, reactant and products are in the different phase

$$2SO_{2(g)} + O_{2(g)} \xleftrightarrow{V_2O_5(s)} 2SO_{3(g)}$$

UNIT 11. HYDROXY COMPOUNDS AND ETHERS

2,3 MARK QUESTIONS

1. Lucas test.

$$(CH_3)_3C-OH \xrightarrow{con\ HCl/anhydrous\ ZnCl_2} (CH_3)_3C-Cl + H_2O$$

Tertiary alcohol — (immediate appearance of turbidity)

$$(CH_3)_2CH-OH \xrightarrow{con\ HCl/anhydrous\ ZnCl_2} (CH_3)_2CH-Cl + H_2O$$

Secondary alcohol — (slow appearance of turbidity)

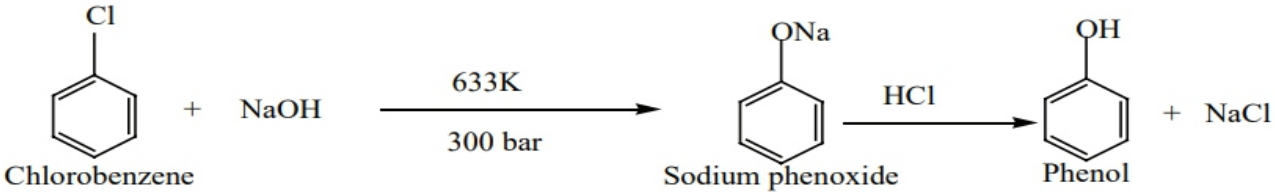
$$CH_3-CH_2-OH \xrightarrow{con\ HCl/anhydrous\ ZnCl_2} \text{No reaction at room temperature}$$

Primary alcohol — (Turbidity appears only on heating)

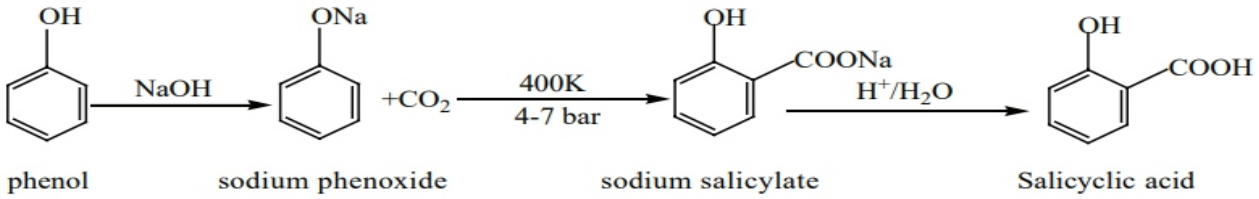
2. Victor mayer's test.

- Tertiary alcohol ⟶ No colouration
- Secondary alcohol ⟶ Blue colour
- Primary alcohol⟶ Red colour

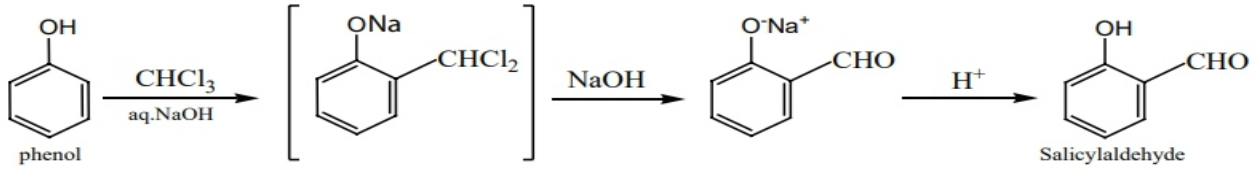
3. Dows process.



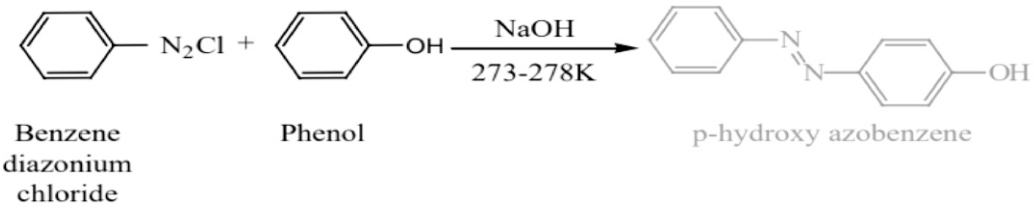
4. Kolbe's (or) Kolbe's Schmit reaction.



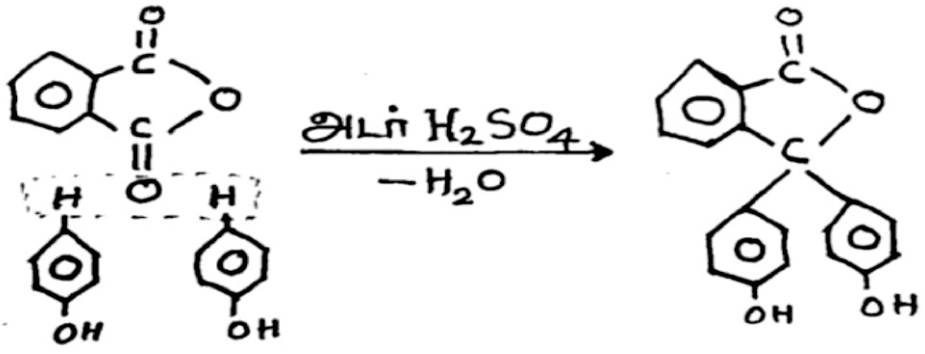
5. Riemer – Tiemann Reaction.



6. Coupling reaction.



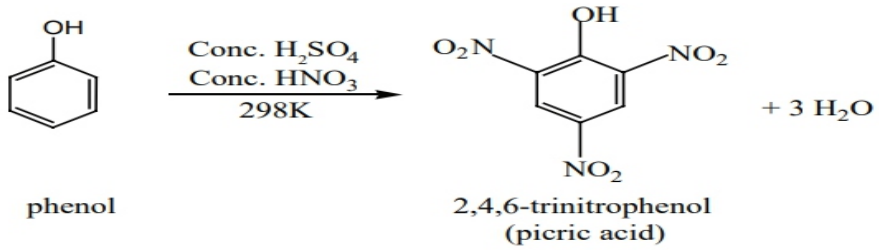
7. How will you prepare Phenolphthalein from Phenol.



8. Test to differentiate alcohol and phenols.

Test	Phenol	Alcohol
1, With neutral $FeCl_3$	Purple colouration	No reaction
2, With Benzene diazonium chloride	To form a red orange dye	No reaction
3, With NaOH	To give sodium phenoxide	No reaction

9. Convert Phenol to Picric acid (2,4,6-trinitrophenol).



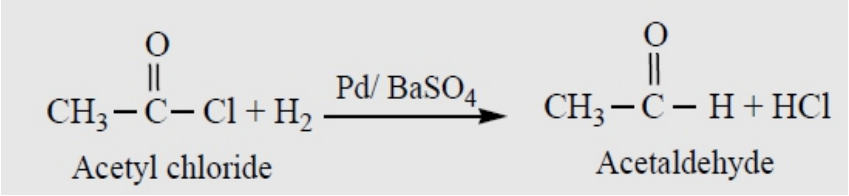
10. Uses of Diethyl ether.

- Surgical anesthetic agent in surgery
- Good solvent for organic reactions
- Used as a refrigerant

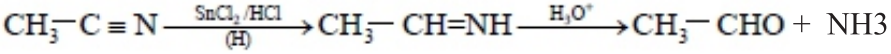
12.CARBONYL COMPOUNDS AND CARBOXYLIC ACIDS

2,3 MARK QUESTIONS

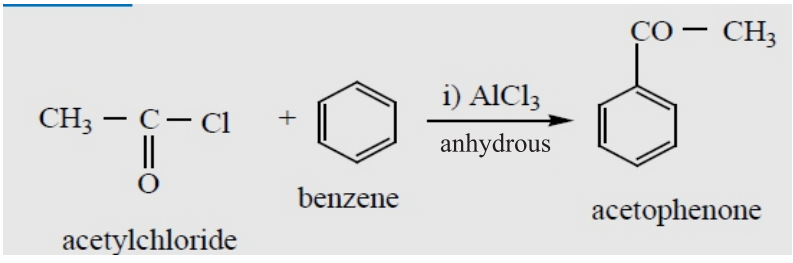
1. Rosenmund reduction.



2. Stephen's reaction.



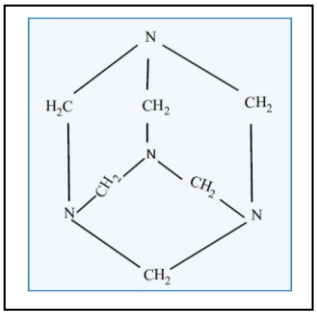
3. Friedal Crafts acylation.



4. Write the prepration of Urotropine.

$$6HCHO + 4\,NH_3 \longrightarrow (CH_2)_6N_4 + 6\,H_2O$$

Formaldehyde — Hexamethylene tetramine



5. Popoff 's rule.

- Unsymmetrical ketone, a (C–CO) bond is cleaved in such a way that the keto group stays with the smaller alkyl group.

$$CH_3-CH_2-CH_2-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow[\text{Con } HNO_3]{(O)} CH_3CH_2-COOH + CH_3COOH$$

6. Clemmensen reduction.

$$CH_3-\underset{\underset{O}{\|}}{C}-H + 4(H) \xrightarrow[\text{Con HCl}]{Zn\text{ - }Hg} CH_3-CH_3 + H_2O$$

Acetaldehyde — Ethane

7. Wolf Kishner reduction.

$$CH_3-\underset{\underset{O}{\|}}{C}-H + 4(H) \xrightarrow[C_2H_5ONa]{NH_2NH_2} CH_3-CH_3 + H_2O + N_2$$

Acetaldehyde — Ethane

8. Haloform reaction.

$$CH_3-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow[NaOH]{3Cl_2} CCl_3-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow{NaOH} CHCl_3 + CH_3-\underset{\underset{O}{\|}}{C}-ONa$$

9. Write a note on Aldol condensation.

$$2CH_3\text{-}CHO \xrightarrow{dil.NaOH} CH_3-\underset{\underset{OH}{|}}{CH}-CH_2-CHO$$

acetaldehyde — Acetaldol (3 - Hydroxy butanal)

10.Cannizaro reaction.

$$\begin{matrix} C_6H_5CHO \\ + \\ C_6H_5CHO \end{matrix} \xrightarrow{50\%\ NaOH} \begin{matrix} C_6H_5CH_2OH \\ \text{Benzylalcohol} \\ + \\ C_6H_5COONa \end{matrix}$$

Benzaldehyde — Sodiumbenzoate

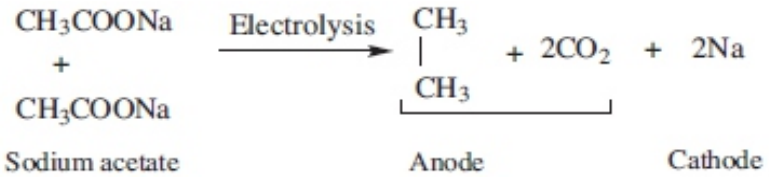
11. Uses of formaldehyde.

- It is used for preserving biological specimens.
- It is used for tanning.

12. What is formalin? Give the uses of formalin.

- 40% aqueous solution of formaldehyde is called formalin.
- Uses : used for preserving biological specimens.

13.Kolbe's electrolytic decarboxylation.



14. HVZ reaction.

$CH_3COOH \xrightarrow{Cl2/redP4} Cl\text{-}CH_2COOH$

15.Reducing action of Formic acid.

- Formic acid contains both an aldehyde as well as an acid group.
- Like other aldehydes, formic acid can easily be oxidised and therefore acts as a strong reducing agent.
- $HCOO^- + 2Ag^+ + 3OH^- \rightarrow 2Ag + CO_3^{2-} + 2H_2O$

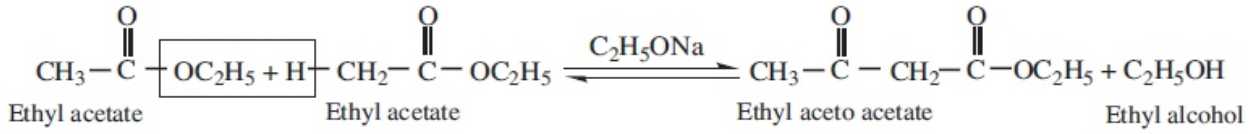
16. Test for Aldehydes

- Reduces Tollens reagent to Metallic Silver.
- Reduces Fehling's Solution to Red colour Cuprous oxide.
- Reduces Benedict's Solution to Red colour Cuprous oxide

17. Test for Carboxylic acid

- In aqueous solution it turns blue litmus red.
- It gives brisk effervescence with sodium bicarbonate due to the evolution of carbon-dioxide.
- When carboxylic acid is warmed with alcohol and Con H_2SO_4 it forms an ester.

18. Claisen Condensation



19. Uses of Formic acid.

- Used as a coagulating agent for rubber latex
- In medicine for treatment of gout
- Used in preservation of fruit juice.

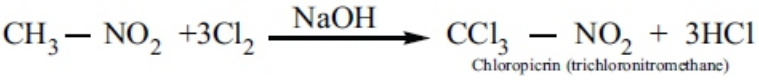
20. Uses of Benzoic acid.

- Used as food preservative.
- Used in medicine as an urinary antiseptic.
- Used for manufacture of dyes.

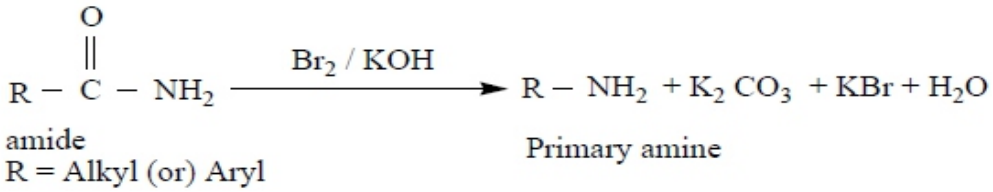
UNIT 13. ORGANIC NITROGEN COMPOUNDS

2,3 MARK QUESTIONS

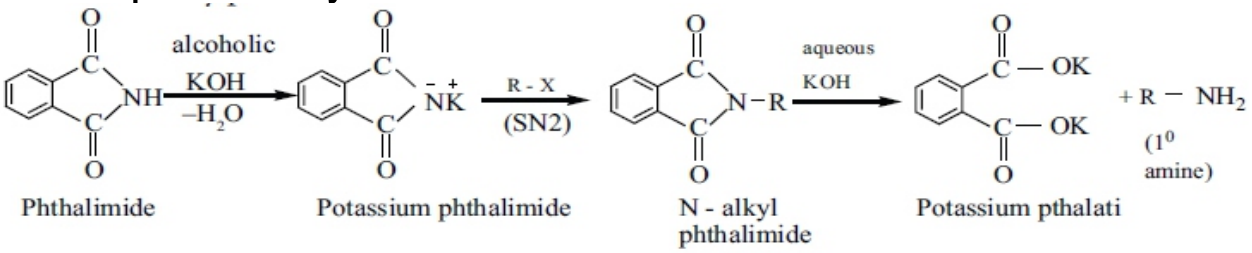
1.Chloropicrin.



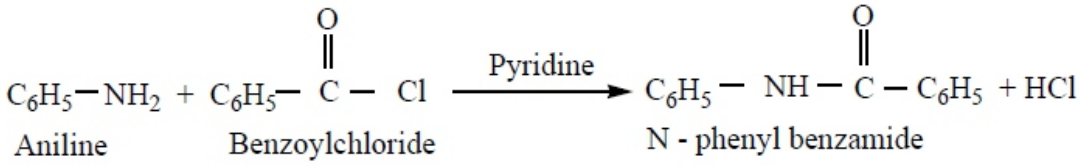
2. Hoffmann's degradation reaction.



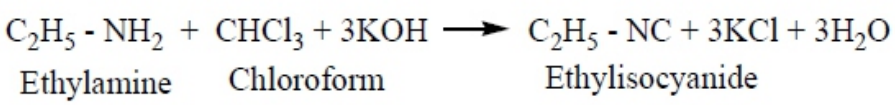
3. Gabriel phthalimide synthesis.



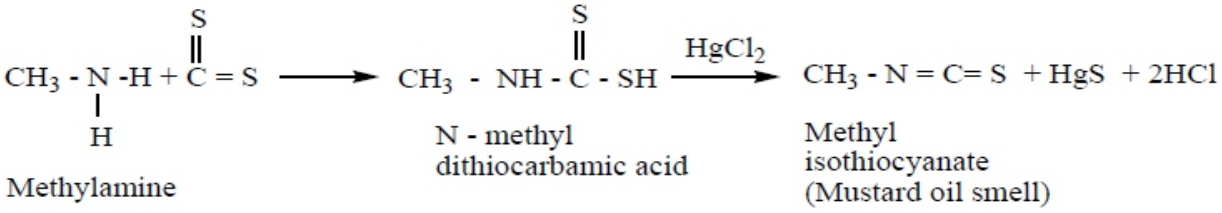
4. Schotten – Baumann reaction.



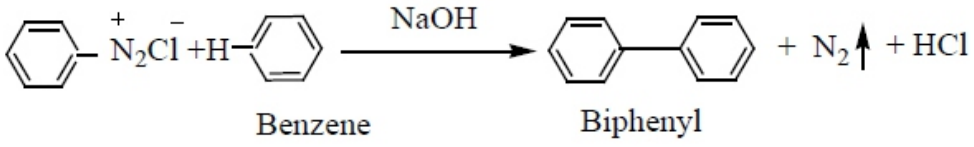
5. Carbylamine reaction.



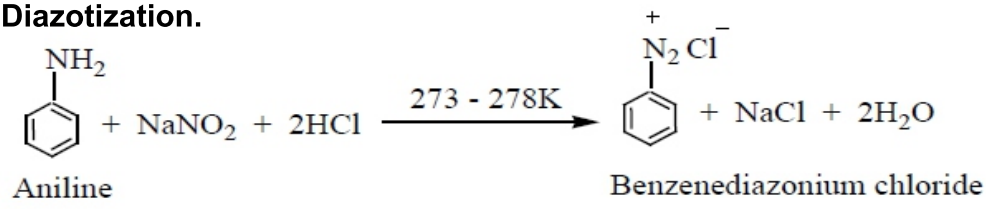
6. Mustard oil reaction.



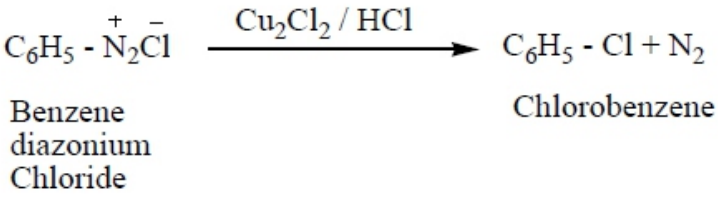
7. Gomberg reaction.



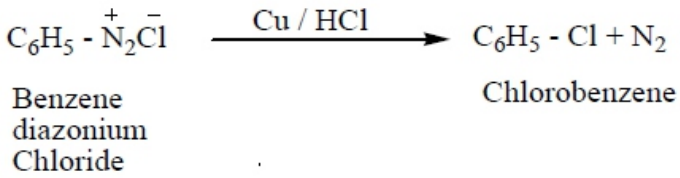
8. Diazotization.



9. Sandmeyer reaction.



10. Gattermann reaction.



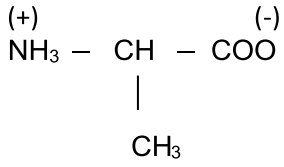
11.Differentiate of primary, secondary, tertiary amines.

Distinction between primary, secondary and tertiary amines		
Primary amine RNH_2	**Secondary amine R_2NH**	**Tertiary amine R_3N**
1. With HNO_2 forms alcohol.	forms N-nitroso amine.	forms salt.
2. With $CHCl_3$/KOH forms carbylamine	No reaction.	No reaction
3. With acetyl chloride forms N-alkyl acetamide.	form N,N-dialkyl acetamide.	No reaction
4. With CS_2 and $HgCl_2$ alkyl isothiocyanate is formed.	No reaction	No reaction
5. With Diethyl oxalate dialkyl oxamide, a solid at room temperature is formed.	Forms N,N-dialkyl oxamic ester, a liquid.	No reaction

UNIT 14. BIO MOLECULES

2,3 MARK QUESTIONS

1. Draw the zwitter ion structure of alanine.



2. How are vitamins Classified ?

- Water soluble vitamins. Ex. Vitamins B & C.
- Fat soluble vitamins Ex. Vitamins A, D, E & K.

3. Define enzymes.

- Enzymes are special proteins called as Bio-catalyst.
- Ex. Invertase.

4. What are Hormones?

- Hormones are organic substance secreted in our tissues.
- Ex. Insulin

5. What one the different types of RNA?

- (i) m-RNA (ii) t-RNA (iii) r-RNA

6. Why Carbohydrates are optically active?

- Due to the presence of chiral carbons.

7. What is isoelectric points?

- At a specific p^H the net charge of the amino acid is neutral is called iso electric point.

8. Name the vitamins which caused rickets and scurvy.

- Vitamin - D -- rickets
- Vitamin - C -- Scurvy.

9. Give the difference between primary and Secondary structure of proteins.

Primary structure of proteins.	Secondary structure of proteins
It explains the arrangement of Amino acids in the polypeptide chain.	It explains the $\propto$ - helix and the β-strand structure of the protein.

10. Differentiate Hormones and Vitamins.

Hormones	Vitamins
Harmones are organic substance secreted in our tissues.	Vitamins are organic substance not secreted in our body.
They are essential to maintain the blood pressure, digestion. Ex. Insulin	They are essential for certain functions and its deficiency caused disease. Ex : Vitamins A, B, C & D

11. What is denaturation of Proteins?

- The loss of three dimensional structure without losing its primary structure.

12. Explain the peptide bond.

- The COOH group of one amino acid reacts with NH_2 group of the second amino acid to form an amide bond called as peptide bond.

- $H_2N - CH_2 - COOH + H_2N - \underset{\displaystyle CH_3}{\underset{|}{CH}} - COOH \text{ ------> } H_2N - CH_2 - CO - NH - \underset{\displaystyle CH_3}{\underset{|}{CH}} - COOH$

12. Define Anomers.

- The conversion of achiral aldehyde carbon into chiral carbon leads to form two isomers.
- Ex. α and β glucose

13. Define Epimers.

- Sugars differ in the configuration of an asymmetric carbon.
- Ex. Galactose and glucose.

14. Explain the functions of Lipids in living organisms?

- Used to transport the fat soluble vitamins
- Act as emulsifier for fat metabolism
- Lipids are the component of cell membrane.

5 MARK QUESTIONS

1. Explain the types of RNA.

Ribosomal RNA (r- RNA):

- It is found in cytoplasm and in ribosomes. It contains 60% RNA & 40% Proteins.

Transfer RNA (t-RNA):

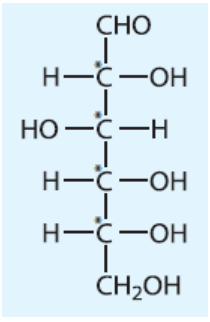
- Its function is to carry the amino acids to the ribosomes for protein synthesis.

Messenger RNA (m-RNA):

- It carries the genetic information from the DNA to the ribosomes for protein synthesis. This is called as transcription.

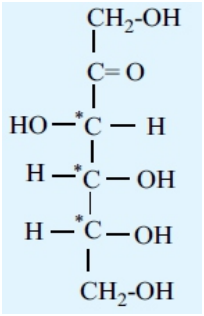
2. Explain the structure of Glucose.

- Molecular formula $C_6H_{12}O_6$
- Glucose + P/HI at 373K $\longrightarrow$ n-hexane. 6 carbon atoms are bonded linearly.
- Glucose + HCN $\longrightarrow$ cyanohydrins. presence of carbonyl group.
- Glucose + acetic anhydride + pyridine $\longrightarrow$ penta acetate. It contains 5 OH groups.
- Glucose + Tollens reagent $\longrightarrow$ Reduction to metallic silver. Presence of Aldehyde group.



3. Explain the structure of Fructose.

- Molecular formula $C_6H_{12}O_6$.
- Fructose + P/HI at 373K ⟶ n-hexane. 6 carbon atoms are bonded linearly.
- Fructose + HCN ⟶ cyanohydrins. presence of carbonyl group.
- Fructose + acetic anhydride +pyridine ⟶ penta acetate. It contains 5 OH groups.
- Fructose + cone.HNO_3 ⟶ Glycollic acid + Tartaric acid. Presence of keto group in the C-2 Position.



4. Differentiate DNA and RNA.

S.No	DNA	RNA
1.	It contains deoxyribose sugar.	It contains ribose sugar.
2.	Double Stranded.	Single Stranded.
3.	Life time is high.	Life time is short.
4.	It can replicate itself.	It cannot replicate itself.
5.	It is present in nucleus.	It is present in ribosomes.

UNIT 15. CHEMISTRY IN EVERYDAY LIFE

2,3 MARK QUESTIONS

1. What are antibiotics?

- The medicines that have the ability to kill the pathogenic bacteria.
- Ex. Amoxicillin.

2. Name the substance which can act as both analgesic and antipyretic.

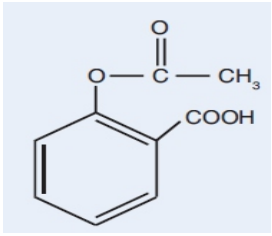
- Aspirin, Paracetamol.

3. What are food preservatives?

- Preservatives are used to reduce growth of microorganisms and reduce fermentation, and the decomposition of the food.
- Ex. Acetic Acid.

4. Write the structural formula of aspirin.

- Acetyl Salicylic acid



5. What are Bio degradable polymers? Give examples.

- The polymers which are decomposed by micro organisms in the environment.
- Ex. PHB, PHBV

6. What are Antifertility drugs? Give examples.

- Synthetic Hormones that suppresses Ovulation (or) fertilization.
- Ex. Menstranol.

7.What are narcotic and non-narcotic drugs? Give examples.

Narcotic drugs:

- Relieve pain and produce sleep. These drugs are addictive.
- Ex. Morphine.

Non-narcotic drugs:

- Analgesics reduce the pain without causing impairments of consciousness.
- Ex. Paracetamol.

8. How do antiseptics differ from disinfectants?

S.No.	Antiseptics	Disinfectants
1.	Stop the growth of microorganisms	Stop the growth of microorganisms
2.	Applied on a living tissue.	It is used on inanimate objects.
3.	Ex. Hydrogen peroxide.	Ex. Hydrogen peroxide.

9. What is Antacids? Give examples.

- These are used to relieve the burning sensation in the stomach.
- Ex. Milk of Magnesia.

10. What is Antioxidants?

- Antioxidants are substances which prevents the oxidative deteriorations of food.
- Ex. BHA, BHT.

11. What are Artificial sweetening agents?

- Synthetic compounds which gives sweet sensation and have no nutritional value.
- Ex. Saccharin.

12. What are sugar substituents? Give examples.

- Compounds that are used like sugars for sweetening. But metabolised without the influence of insulin.
- Ex. Sorbitol.

5 MARK QUESTIONS

1.What are Anaesthetics ? Explain its types.

- The drugs which produce loss of sensation.

General Anaesthetics:

- It Cause reversible loss of consciousness by affecting central nervous system.
- Ex. propofol.

Local anaesthetics:

- It causes loss of sensation, in the area in which it is applied without losing consciousness.
- Ex. procaine.