AP 2017 Class 12 Chemistry

Paper - II

Time:3 Hours   **Max.Marks:60**

Note: Read the following instructions carefully:

 1)Answer all the questions of Section-'A'. Answer any six questions from Section-'B' and any two questions from Section-'C'.

2) In Section-'A', Questions from Sr. Nos. 1 to 10 are of "very short answer type". Each question carries two marks. Every answer may be limited to two to three sentences. Answer all the questions at one place in the same order.

3) In Section-'B', Questions from Sr. Nos. 11 to 18 are of "Short answer type". Each question carries four marks. Every answer may be limited to 75 words.

4)In Section-'C', Questions from Sr.Nos.19 to 21 are of" Long answer type". Each question carries eight marks. Every answer may be limited to 300 words.

5)Draw labelled diagram, wherever necessary for questions in section-'B' and 'C'.

SECTION- A   **10 × 2 = 20**

Note: Answer all the questions:

1.What is Vulcanization of rubber?

Ans: It is the process in which the rubber is heated in the presence of Sulphur which result in the cross linking of the chain of rubber molecule. Vulcanization of rubber is used to improve the elasticity and strength of the rubber.

2. Name the monomers present in the following polymers:

(a) Bakeite

(b) Buna-N

Ans: (a) Phenol and formaldehyde are the monomer units of bakelite.

(b) 1,3-butadiene and acrylonitrile are the monomer unit of Buna-N.

3. What are Disinfectants? Give example.

Ans: Disinfectants are frequently used in hospitals, dental surgeries, kitchens, and bathrooms to kill infectious organisms. Bacterial endospores are most resistant to disinfectants, but some viruses and bacteria also possess some tolerance.

Eg. Bleach,Thymol

4.What are Food Preservatives? Give example.

Ans: A preservative is a substance or a chemical that is added to products such as food, beverages, pharmaceutical drugs, paints, biological samples, cosmetics, wood, and many other products to prevent decomposition by microbial growth or by undesirable chemical changes.

Food preservatives are chemicals that prevent food from spoilage due to microbial growth. Table salt, sugar, vegetable oil, sodium benzoate (C_6H_3COONa), and salts of propanoic acid are some examples of food preservatives.

5. Give the composition of following alloys:

a) Brass

b) German Silver

Ans: (a) brass: alloy of Copper and Zinc. (Cu + Zn)

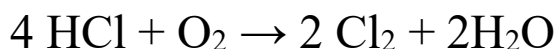(b) german silver: alloy of Copper, Zinc and Nickel.

(Cu +Zn + Ni)

6. What is Primary Battery? Give example.

Ans: Primary battery are those battery which is used only one time and then they are discarded.

Example are dry cell.

7. How is chlorine manufactured by Deacon's method?

Ans: In 1874, Henry Deacon had derived a process to reduce HCl emissions as mandated by the Alkali Act. In this process, hydrogen chloride is oxidized by oxygen over a copper chloride catalyst, resulting in the production of chlorine.
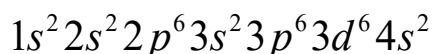
$$4\ HCl + O_2 \rightarrow 2\ Cl_2 + 2H_2O$$

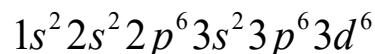## 8. What happens when Cl2 react with dry slaked lime?

Ans: Slaked lime reacts with chlorine gas to produce the bleaching agent calcium hydrochloride- common from of swimming pool chlorine. When Chlorine gas is passed through dry slaked lime ,it is rapidly absorbed, forming bleaching powder or chloride of Lime. The reaction is: $Ca(OH)_2 + Cl = CaOCl_2 + H_2O$. Also water is formed with bleaching powder

9. Calculate the spin only magnetic moment of Fe+2 ion.

Ans: Electronic configuration of Fe is,

$$1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s^2$$

Electronic configuration Fe +2

$$1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$$

Unpaired electrons in Fe $= 4$

Formula used for magnetic moment :

$$\mu = \sqrt{n(n+2)}$$

$$\mu = \sqrt{4(4+2)} = 4.9 BM$$

10.What are Isotonic Solutions?

Ans: An isotonic solution refers to two solutions having the same osmotic pressure across a semipermeable membrane. This state allows for the free movement of water across the membrane without changing the concentration of solutes on either side

SECTION- B   (6 × 4 = 24)

Note: Answer Any Six questions.

11. State Raoult's law. Calculate the mole fraction of H2SO4 in a solution containing 98% of H_2SO_4 by mass.

Ans: Raoult's law states that in a solution, the vapour pressure of a component at a given temperature is equal to the mole fraction of that component in the solution multiplied by the vapour pressure of that component in the pure state.

So.

Mass of solute = 98 g

Mass of solvent = 2g (as water is considered as universal solvent)

Molar mass of solute = 98g

Molar mass of solvent = 18g

No of moles of solute = 1 mole (no of moles = given mass / molar mass)

No of moles of solvent = 2/18 = 1/9 moles

And ,

We know formula for mole fraction is..

x (of solute) = Moles of solute/ (moles of solute + moles of solvent)

x (of solute) = 1/(1+ (1/9)) = 0.9

x (of solvent) = 1 - 0.9 = 0.1

12. Derive Bragg's Equation.

Ans: The phases of the beams coincide when the incident angle equals reflecting angle. The rays of the incident beam are in phase and parallel up to point z, which is the point at which top beam strikes the top layer. The second beam passes to next layer and is scattered by B. The second beam travels extra distance AB + BC. This extra distance is an integral multiple of the wavelength.

$n\lambda = AB + BC$.

But

$AB = BC$

$n\lambda = 2AB....(1)$

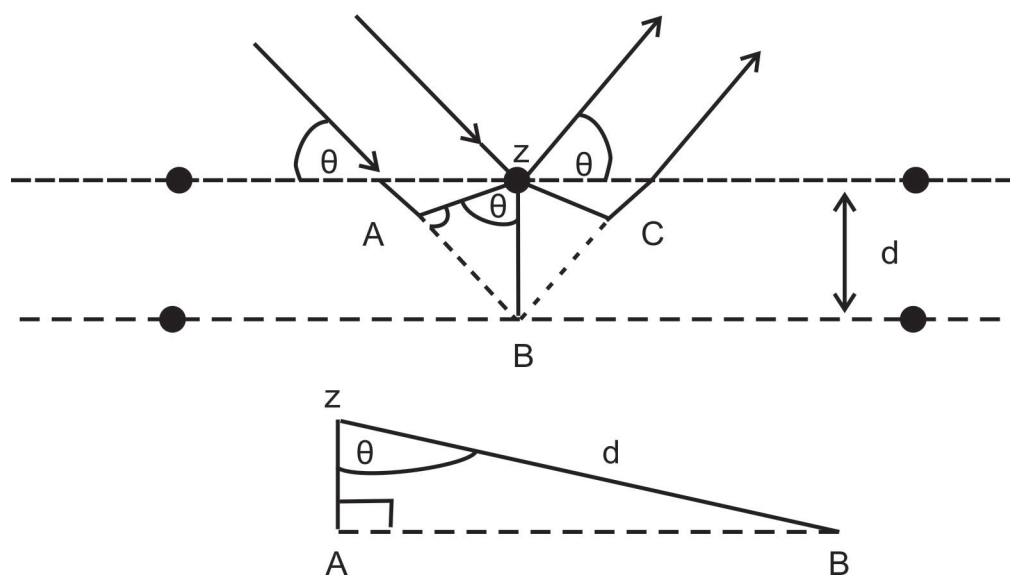d is the hypotenuse of the right triangle Abz. Ab is opposite to angle θ

AB=dsinθ.....(2)

Substitute equation (2) in equation (1)

nλ=2dsinθ

This is equation for Bragg's law

13.What are Emulsions? How are they classified?

Ans: Emulsion: The colloidal solution in which both the dispersed phase and dispersion medium are liquids is called an emulsion.

Emulsions are classified as-Oil in water type- The emulsion in which oil is present as the dispersed phase and water as the dispersion medium (continuous phase) is called an oil-in-water

emulsion

E.g. Milk is an example of the oil-in-water type of emulsion.

Water in oil type- The emulsion in which water forms the dispersed phase, and the oil acts as the dispersion medium is called a water-in-oil emulsion.

E.g. Butter is an example of the water-in-oil type of emulsion.

14. Explain the purification of sulphide ore by Froth Flotation method.

Ans: The purification of Sulphide ores by froth floatation method:

This method is used for the concentration of sulphide ore such as galena (PbS)zinc blende(ZnS) and copper pyrites (CuFeS2)To water tank, finely divide ore is added. Pine oil, eucalyptus oil, xanthates or fatty acids etc are added. Compressed air is passed through water tank.

Metallic sulphide particles of ore are preferentially wetted by oil. They rise to the surface along-with froth.

The gangue particles are wetted by water. They settle at bottom.

15. Give the sources of the following Vitamins and name the diseases caused by their deficiency.

a) A   b) D   c) E   d) K

Ans: Vitamins Sources Diseases caused by deficiency

a) A   Apricots liver disorders,hematopoiesis

b) D   Cheese,Liver soft bones,skeletal deformities

c) E   Nuts,Seeds Disorentation and vision problem

d) K   Fish,Eggs   Bleeding,hermorrhagic disease of the newborn

16. Explain Werner's theory of Co-ordination compounds with suitable examples.

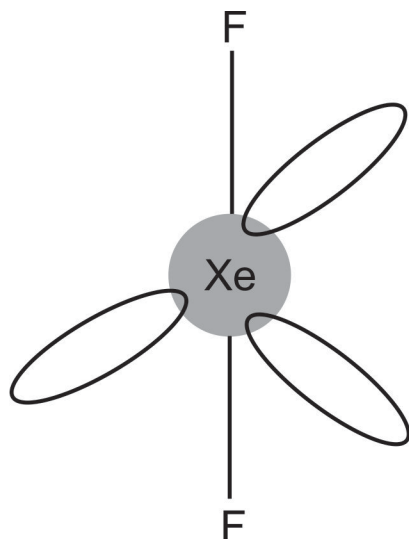**Ans:** The main postulates of Werner's theory of coordination compounds are:

1. In the coordination compound , metal show two types of linkage - primary and secondary.

2. Primary valency are ionizable and are satisfied by negative ions.

3. Secondary valency are non-ionizable are satisfied by neutral molecules. It is equal to the the coordination number of a metal which is fixed for a metal.

4. The ions bound by secondary linkage to the matter have characteristics of spatial arrangement equal to different coordination number.

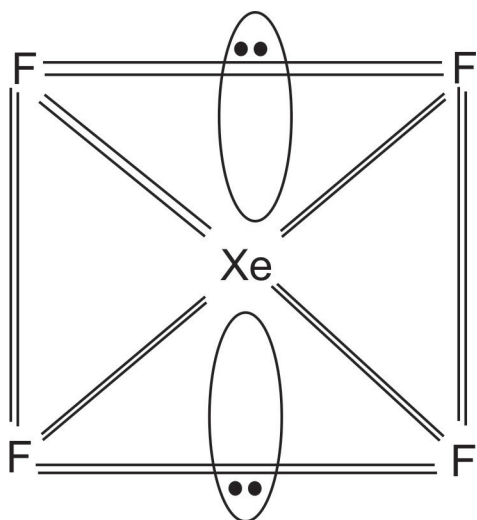**17. How are XeF_2 and X_eF_4 are prepared? Give their structures.**

Ans:

1. Xenon difluoride (XeF_2): xenon difluoride is the mixture of

xenon and fluorine by the ratio of 2:1 is passed through nikal tube at 400 degree Celsius.

2.Xenon tetrafluoride (XeF_4): xenon tetrafluoride is the mixture of xenon and fluorine by the ratio 1:5 is passed at 400 degree Celsius and 5 -6 atm.
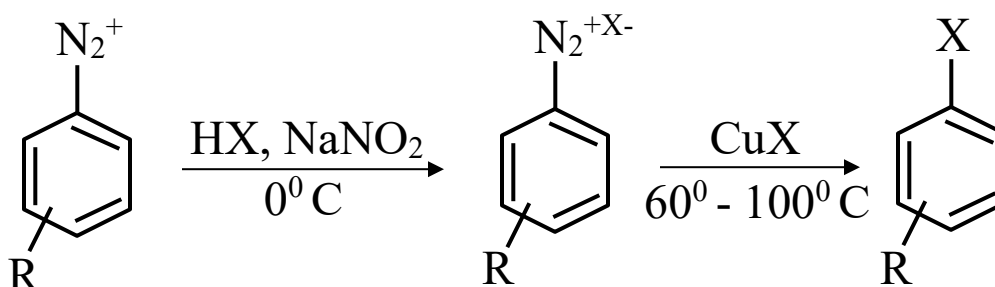

18. Explain the following reaction:

a) Sandmeyers's reaction

Ans: In Sandmeyers reaction, a benzeneamine or an Aniline is

treated with sodium nitrite (NaNO$_2$) in the presence of HCl or any suitable Halogen acids at 273.15K.
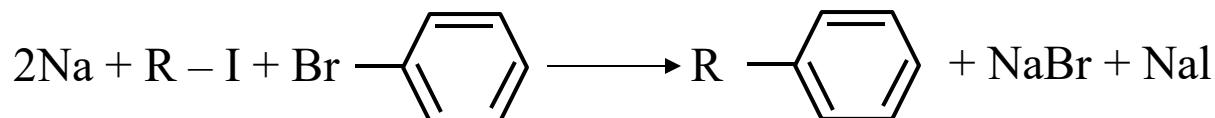
This reaction gives a diazoinum salt of that halogen, this diazoinum salt is then again reacted with cupprous halide which results in formation of a Haloarene.

X=CN, Br, Cl, SO$_3$H

b) Wutz's Fittig Reaction

Ans: The reaction in which alkyl halides on treatment with sodium metal in dry ethereal (free from moisture) solution give higher alkanes is known as Wurtz reaction and is used for the preparation of higher alkanes containing even number of carbon atoms.

SECTION – C   (2 × 18 = 16)

Note: Answer any two questions.

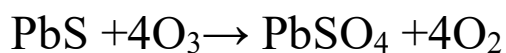**19. a) How is Nitric acid manufactured by Ostwald's process?**

Ans: Manufacturing of nitric acid is occurred in three steps:

1. Ammonia is firstly oxidized to form nitric oxide.
2. Then this nitric oxide combines with oxygen and form nitrogen oxide.
3. Then the nitrogen dioxide that was formed is absorbed by the water. Then it turns and forms the nitric acid.
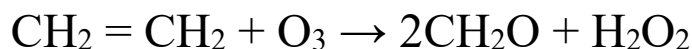
b) How does Ozone react with the following:
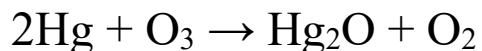
 i) PbS   ii) C_2H_2 iii) Ag   iv) Hg

Ans: i) PbS: Lead Sulfide react with ozone to produce lead sulphate and oxygen at room temperature.

$PbS + 4O_3 \rightarrow PbSO_4 + 4O_2$

ii) C_2H_4: Ethylene reacts with ozone to produce ozonide which is decomposed by zn dust and water to form formaldehyde.

$CH_2 = CH_2 + O_3 \rightarrow 2CH_2O + H_2O_2$

iii) Hg: Mercury reacts with ozone to form an oxide. Meniscus of mercury is lost and mercurous oxide sticks to the glass. It is known as tailing of mercury.

$2Hg + O_3 \rightarrow Hg_2O + O_2$

20. Give a detailed account of the Collision theory of reaction rates of bimolecular gaseous reactions.

Ans: Collision theory of reaction rates of bimolecular gaseous reactions-

This theory was proposed by Arrhenius and developed by Max Treitz and William Lewis to explain the rates of gaseous reactions. It is based on the kinetic theory of gases. According to this theory, the reactant molecules are assumed to be hard spheres. Collisions must take place between reactants (molecules) to occur a reaction. Collisions are possible if 2 or more molecules are present.
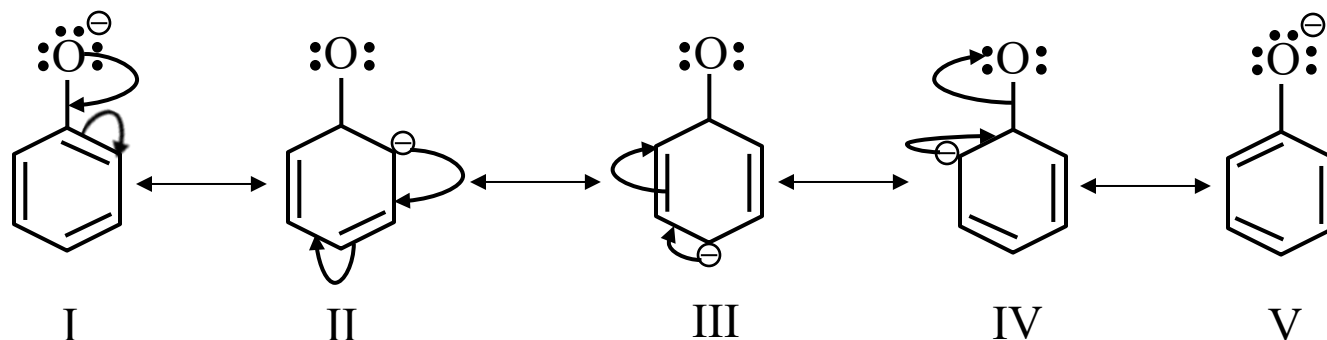
The minimum energy must be possessed by the reactant molecules to give products is called threshold energy (E_T). Molecules having other than threshold energy are called "normal molecules".

Collisions between normal molecules are called "normal collisions", which do not lead the chemical reaction, hence products are not formed.

In addition to the normal molecules, the molecules must aquire some extra amount of energy, called "activation energy"

21. a) Explain the acidic nature of phenols and compare with that of alcohols.

Ans: Phenol is more acidic because when it loses one H+ ion it form phenoxide ion which is stable (resonance stabilized).
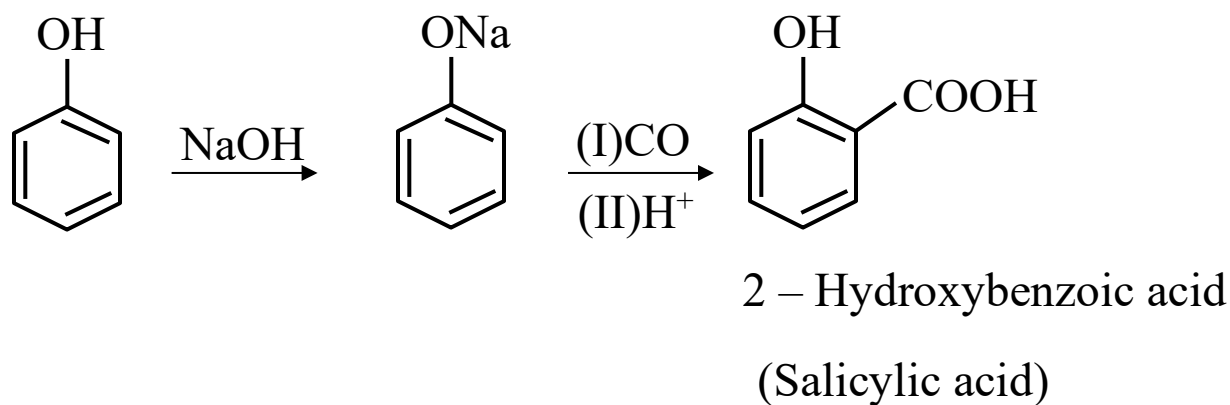

I   II   III   IV   V

But alcohols do not give H+ ions easily to form alkoxide ion which is not stable and readily take the H+ ion and form alcohol again.

b) With suitable example, write equations for the following:

i) Kolbe's reaction:

Reaction of phenol with NaOH and CO_2 to form salicylic acid is known as Kolbe's reaction.

2 – Hydroxybenzoic acid

(Salicylic acid)

ii)Reimer-tiemann reaction:-

Reimer-tiemann reaction take place for used of the ortho-formylation of phenols. The best example of Reimer tiemann reaction is conversion of phenol to salicylaldehyde .