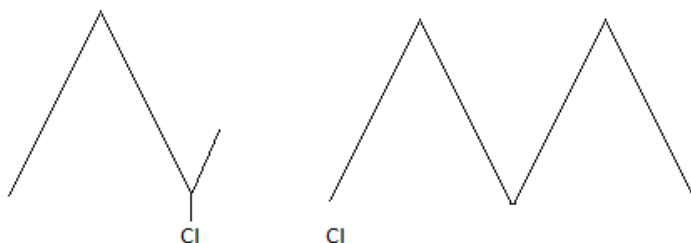


Class XII Chemistry (Theory)
Board Question Paper 2014 – Set 2

1. What is the effect of temperature on chemisorption ?
2. What is the role of zinc metal in the extraction of silver?
3. What is the basicity of H_3PO_3 ?
4. Identify the chiral molecule in the following pair :

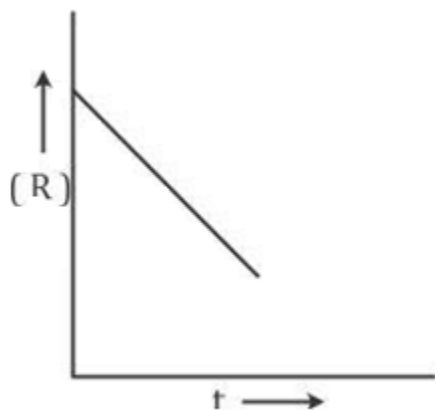


5. Which of the following is a natural polymer ?
Buna-S, Proteins, PVC
6. The conversion of primary aromatic amines into diazonium salts is known as _____
7. What are the products of hydrolysis of sucrose?
8. Write the structure of p-methylbenzaldehyde.
9. An element with density 2.8 g cm^{-3} forms a f.c.c. unit cell with edge length $4 \times 10^{-8} \text{ cm}$. Calculate the molar mass of the element. (Given : $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$)
10.
 - i. What type of non-stoichiometric point defect is responsible for the pink colour of LiCl?
 - ii. What type of stoichiometric defect is shown by NaCl?

OR

How Will you distinguish between the following pairs of terms:

 - i. Tetrahedral and octahedral voids
 - ii. Crystal lattice and unit cell
11. State Kohlrausch law of independent migration of ions. Why does the conductivity of a solution decrease with dilution?
12. For a chemical reaction $\text{R} \rightarrow \text{P}$, the variation in the concentration (R) vs. time (t) plot is given as



- i. Predict the order of the reaction.
 - ii. What is the slope of the curve?
13. Explain the principle of the method of electrolytic refining of metals. Give one example.
 14. Complete the following equations :
 - i. $P_4 + H_2O \rightarrow$
 - ii. $XeF_4 + O_2F_2 \rightarrow$
 15. Draw the structures of the following :
 - i. XeF_2
 - ii. BrF_3
 16. Write the equations involved in the following reactions:
 - i. Reimer - Tiemann reaction
 - ii. Williamson synthesis
 17. Write the mechanism of the following reaction:

$$CH_3CH_2OH \xrightarrow{HBr} CH_3CH_2Br + H_2O$$
 18. Write the name of monomers used for getting the following polymers :
 - i. Bakelite
 - ii. Neoprene
 19.
 - a) Calculate $\Delta_r G^\circ$ for the reaction

$$Mg (s) + Cu^{2+} (aq) \longrightarrow Mg^{2+} (aq) + Cu (s)$$

Given : $E^{\circ}_{\text{cell}} = + 2.71 \text{ V}$, $1 \text{ F} = 96500 \text{ C mol}^{-1}$

b) Name the type of cell which was used in Apollo space programme for providing electrical power.

20. The following data were obtained during the first order thermal decomposition of SO_2Cl_2 at a constant volume:



Experiment	Time / S^{-1}	Total pressure/atm
1	0	0.4
2	100	0.7

Calculate the rate constant.

(Given: $\log 4 = 0.6021$, $\log 2 = 0.3010$)

21. What are emulsions? What are their different types? Give one example of each type.

22. Give reasons for the following:

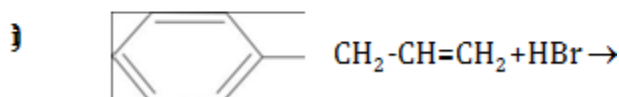
- $(\text{CH}_3)_3\text{P} = \text{O}$ exists but $(\text{CH}_3)_3\text{N} = \text{O}$ does not.
- Oxygen has less electron gain enthalpy with negative sign than sulphur.
- H_3PO_2 is a stronger reducing agent than H_3PO_3 .

23.

- Write the IUPAC name of the complex $[\text{Cr}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$.
- What type of isomerism is exhibited by the complex $[\text{Co}(\text{en})_3]^{3+}$?
(en = ethane-1,2-diamine)
- Why is $[\text{NiCl}_4]^{2-}$ paramagnetic but $[\text{Ni}(\text{CO})_4]$ is diamagnetic?
(At. nos. : Cr = 24, Co = 27, Ni = 28)

24.

a) Draw the structures of major monohalo products in each of the following reactions:



b) Which halogen compound in each of the following pairs will react faster in $\text{S}_{\text{N}}2$ reaction :

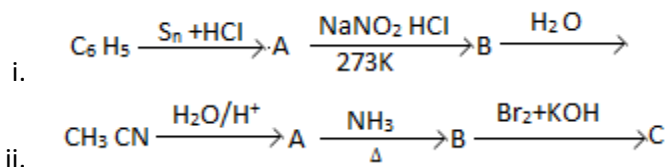
- CH_3Br or CH_3I
- $(\text{CH}_3)_3\text{C}-\text{Cl}$ or CH_3-Cl

25. Account for the following:

- i. Primary amines (R-NH₂) have higher boiling point than tertiary amines (R₃N).
- ii. Aniline does not undergo Friedel - Crafts reaction.
- iii. (CH₃)₂NH is more basic than (CH₃)₃N in an aqueous solution.

OR

Give the structures of A, B and C in the following reactions:



26. Define the following terms as related to proteins:

- i. Peptide linkage
- ii. Primary structure
- iii. Denaturation

27. On the occasion of World Health Day, Dr. Satpal organized a 'health camp' for the poor farmers living in a nearby village. After check-up, he was shocked to see that most of the farmers suffered from cancer due to regular exposure to pesticides and many were diabetic. They distributed free medicines to them. Dr. Satpal immediately reported the matter to the National Human Rights Commission (NHRC). On the suggestions of NHRC, the government decided to provide medical care, financial assistance, setting up of super-speciality hospitals for treatment and prevention of the deadly disease in the affected villages all over India.

- i. Write the values shown by
 - a) Dr. Satpal
 - b) NHRC.
- ii. What type of analgesics are chiefly used for the relief of pains of terminal cancer?
- iii. Give an example of artificial sweetener that could have been recommended to diabetic patients.

28.

a) Define the following terms :

- i. Molarity
- ii. Molal elevation constant (K_b)

b) A solution containing 15 g urea (molar mass = 60 g mol⁻¹) per litre of solution in water has the same osmotic pressure (Isotonic) as a solution of glucose (molar mass = 180 g mol⁻¹) in water. Calculate the mass of glucose present in one litre of its solution.

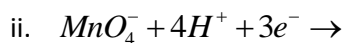
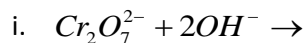
OR

a) What type of deviation is shown by a mixture of ethanol and acetone? Give reason.

- b) A solution of glucose (molar mass = 180 g mol^{-1}) in water is labelled as 10% (by mass).
What would be the molality and molarity of the solution? (Density of solution = 1.2 g mL^{-1})

29.

- a) Complete the following equations :

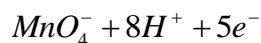


- b) Account for the following:

- Zn is not considered as a transition element.
- Transition metals form a large number of complexes.
- The E^0 value for the $\text{Mn}^{3+}/\text{Mn}^{2+}$ couple is much more positive than that for $\text{Cr}^{3+}/\text{Cr}^{2+}$ couple.

OR

- With reference to structural variability and chemical reactivity, write the differences between lanthanoids and actinoids.
- Name a member of the lanthanoid series which is well known to exhibit +4 oxidation state.
- Complete the following equation :



- Out of Mn^{3+} and Cr^{3+} , which is more paramagnetic and why?
(Atomic nos. : Mn = 25, Cr = 24)

30.

- a) Write the products formed when CH_3CHO reacts with the following reagents:

- HCN
- $\text{H}_2\text{N}-\text{OH}$
- CH_3CHO in the presence of dilute NaOH

- b) Give simple chemical tests to distinguish between the following pairs of compounds:

- Benzoic acid and Phenol
- Propanal and Propanone

OR

- a) Account for the following:

- $\text{Cl}-\text{CH}_2\text{COOH}$ is a stronger acid than CH_3COOH .
- Carboxylic acids do not give reactions of carbonyl group.

- b) Write the chemical equations to illustrate the following name reactions:

- Rosenmund reduction
- Cannizzaro's reaction

- c) Out of $\text{CH}_3\text{CH}_2-\text{CO}-\text{CH}_2-\text{CH}_3$ and $\text{CH}_3\text{CH}_2-\text{CH}_2-\text{CO}-\text{CH}_3$,
which gives iodoform test ?