

CBSE Board
Class XII Chemistry
Sample Paper-3

Time: 3 Hrs

Total Marks: 70

- (a) All questions are compulsory.
- (b) Marks for each question are indicated against it. Question 26 is a value based question carrying four marks.
- (c) Question nos. 9 to 18 are short answer questions and carry 2 marks each. Use of calculator is not permitted.
- (d) Question nos. 19 to 27 are also short answer questions and carry 3 marks each
- (e) Question nos. 28 to 30 are long answer questions and carry 5 marks each
- (f) Use log tables if necessary, use of calculators is not allowed.

Q 1. What are the products of hydrolysis of one molecule of sucrose?

Q 2. Name a reagent required to oxidize primary alcohol to aldehyde in good yield.

Q 3. p-Dichlorobenzene has a higher melting point than ortho and meta isomer. Why?

Q 4. Why are amorphous solids sometimes called super cooled liquids?

Q 5. Frenkel defect is not found in halides of alkali metals. Why?

Q 6. Can a bimolecular reaction ever be a first order reaction? State the condition under which it is possible.

Q 7. For what type of reactions the rate constant shall have the same units as the rate of reaction?

Q 8. P_4O_{10} is a well known dehydrating agent, but cannot be used for drying ammonia. Why?

Q 9. When heated above 916°C , iron changes its crystal structure from body centered cubic to cubic closed packed structure. Assuming that the metallic radius of an atom does not change, calculate the ratio of the density of the bcc crystal to that of ccp crystal.

Q 10. In a cell reaction, the equilibrium constant K_c is less than one.

(a) Is E^\ominus for the cell positive or negative?

(b) What will be the value of K_c if $E^\ominus_{\text{cell}} = 0$?

Q 11. On mixing equal volumes of equimolar yellow colloid of As_2S_3 and brown $\text{Fe}(\text{OH})_3$, a colourless solution is formed. Explain.

Q 12.

What type of graph is obtained when temperature is plotted against x/m for physical and chemical adsorption?

Q 13. Give reason for the following:

(a) Bleaching action of SO_2 is temporary.

(b) H_3PO_2 and H_3PO_3 act as good reducing agents while H_3PO_4 is not.

OR

Give reason for the following giving chemical equation:

(a) Chlorine water acts as a bleaching agent

(b) Ozone gas leads to liberation of violet vapours when added to KI.

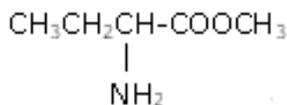
Q 14. What happens when tert-Butyl methyl ether is made to react with HI? Give reasons.

Q 15. Give a chemical test to distinguish between methanol and ethanol.

Q 16. Which of the two has higher pK_b value and why? CH_3CONH_2 or $\text{CH}_3\text{CH}_2\text{NH}_2$.

Q 17. Give IUPAC names of following.

(a)

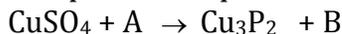


(b) $\text{C}_6\text{H}_5\text{NHCH}_3$

Q 18.

(a) Noble metals like gold do not dissolve in any of the mineral acids. Give a suitable reagent which can be used for this. Give the equation involved.

(b) Complete the equation



Q 19. A reaction: $\text{SO}_2\text{Cl}_2 \rightarrow \text{SO}_2 + \text{Cl}_2$ is first order with half life of 3.15×10^4 s at 320°C . What percentage of SO_2Cl_2 would be decomposed on heating at 320°C for 90 minutes?

Q 20. Write the reactions which take place in the mercury cell. For what type of devices can we use mercury cell?

Q 21. An oxide ore of a metal contains oxides of Fe, Si and Ti as impurities. It is concentrated using a chemical method and further reduced using electrolysis. The metal is widely used as packing material for household purposes. Identify the metal, ore and give equations involved in its concentration.

Q 22.

- (a) Interhalogen compounds are more reactive than halogens.
 (b) Noble gases form compounds with fluorine and oxygen only.
 (c) Oxygen molecule has the formula O_2 whilst sulphur molecule is S_8 . Why?

Q 23. Ashish has been given a science project to estimate the hardness of water samples collected from different places. He went to water testing laboratory of his city. There he came to know about some specific terms like 'titration' and 'EDTA'. Explain these terms. How far his project may be useful for the local habitants?

Q 24. What is paracetamol? Give its structure. Mention two medicinal effects it can have on human body.

Q 25.

- (a) What is the role of Benzoyl peroxide in polymerization of ethene?
 (b) What are LDPE and HDPE? How are they prepared?

Q 26

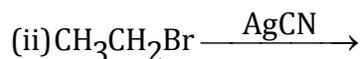
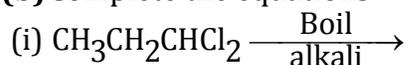
- (a) Amylose and cellulose both are straight chain polysaccharides containing only D-glucose units. What is the structural difference between the two?
 (b) Why does milk get coagulated when lemon juice is added to it?

Q 27. An organic compound A with molecular formula C_4H_9Br on treatment with alcoholic KOH gave two isomeric compounds B and C with the formula C_4H_8 . On ozonolysis, B gave only one product CH_3CHO while C gave two different products. Identify the compounds A, B and C.

OR

(a) Grignard reagents should be prepared under anhydrous conditions. Why?

(b) Complete the equations



Q 28. The degree of dissociation of $Ca(NO_3)_2$ in dilute aqueous solution containing 7.0 g of the salt per 100 g water at $100^\circ C$ is 70 per cent. If the vapour pressure of water at $100^\circ C$ is 760 mmHg, calculate the vapour pressure of the solution.

OR

The molar volume of liquid benzene (density = 0.877 g mL^{-1}) increases by a factor of 2750 as it vapourises at $20^\circ C$ and that of liquid toluene (density = 0.867 g mL^{-1}) increase by a factor of 7720 at $20^\circ C$. A solution of benzene and toluene at $20^\circ C$ has a vapour pressure of 46.0 torr. Find the mole fraction of benzene in the vapour above the solution.

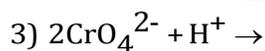
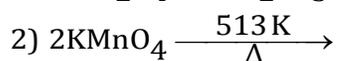
Q 29. Give reasons:

- (a) Cr²⁺ is a strong reducing agent whereas Mn²⁺ is not. (Cr=24, Mn=25)
- (b) The transition metal ions such as Cu⁺, Ag⁺ and Sc³⁺ are colourless.
- (c) The enthalpies of atomization of transition metal of 3d series do not follow a regular trend throughout the series.
- (d) The radius of Fe²⁺ (Z=26) is less than that of Mn²⁺ (Z=25).
- (e) Chemistry of the actinoids is much more complicated than that of the lanthanoids.

OR

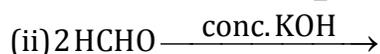
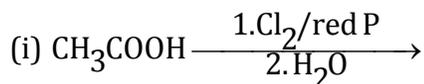
(i) Write the chemical equations involved in the following.

(a)



(b) Use Hund's rule to derive the electronic configuration of Ce³⁺ ion, and calculate its magnetic moment on the basis of 'spin - only' formula.

Q 30. Complete the equations and name the reaction represented.



OR

Q 30. Complete the equations.

