

# CHEMISTRY

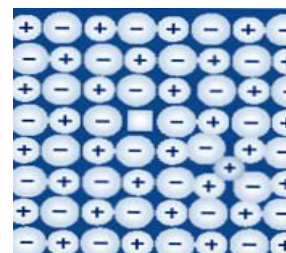
## Class - XII

### 1 mark questions

1. What type of solid is silicon carbide ?
2. How is the conductivity of an intrinsic semiconductor increased ?
3. What type of magnetism observed when the magnetic moments are aligned in parallel and anti-parallel directions in unequal numbers ?
4. What is the value of  $\chi$  for a compound which undergoes tetramerisation in an organic solvent ?
5. Which will have higher freezing point, 0.1M NaCl or 0.1 M BaCl<sub>2</sub> solution in water and why?
6. What is meant by 'limiting molar conductivity' ?
7. Under what condition will a galvanic cell send no current into outer circuit ?
8. Which cell is generally used in hearing aids ?
9. Is there any reaction for which reaction rate does not decrease with time ?
10. What is a colloidion?
11. Which isomer of C<sub>4</sub>H<sub>9</sub>Br undergoes S<sub>N</sub>1 reaction easily & why?
12. Draw the structure of Hex-2-en-4-ynoic acid.
13. Give the IUPAC name of the following compound : CH<sub>3</sub>CH= C(CH<sub>3</sub>) CHBrCH<sub>3</sub>
14. Why are carbohydrates generally optically active ?
15. A coordination compound with molecular formula CoCl<sub>3</sub>.6NH<sub>3</sub> precipitates one mole of AgCl when mixed with AgNO<sub>3</sub> solution. What is the structural formula and name of the compound ?

### 2 marks questions

1. Sodium crystallises in b.c.c. unit cell. Calculate the approximate number of unit cells in 9.2 g of sodium (atomic mass of Na = 23 u).
2. If the radius of the octahedral void is r & radius of the atoms in closed packing is R , derive relation between r & R.
3. (a) Name the defect shown by this diagram.  
(b) How is the density of a crystal affected by this defect ?  
(c) Name an ionic compound which can show this type of defect.  
(d) How is the stoichiometry of the compound affected ?



4.  $\text{FeCl}_3$  on reaction with  $\text{K}_4[\text{Fe}(\text{CN})_6]$  in aqueous solution gives blue colour.  $0.01\text{M}$   $\text{FeCl}_3$  solution (Side Y) and  $0.1\text{M}$   $\text{K}_4[\text{Fe}(\text{CN})_6]$  solution (Side X) are separated by a semipermeable membrane. Will there be the appearance of a blue colour on the side X due to osmosis? Justify your answer.
5. (a) State Henry's Law for the solubility of gas in liquid.  
(b) Gas 'A' is more soluble in water than Gas 'B' at the same temperature. Which one will have the higher value of  $K_H$  and why?
6. How does molar conductivity vary with dilution for strong and weak electrolyte in a conductivity cell? Justify your answer. Show both the variations graphically.
7. (a) Consider the reaction:  $\text{Cr}_2\text{O}_7^{2-} + 14\text{H}^+ + 6\text{e}^- \rightarrow 2\text{Cr}^{3+} + 7\text{H}_2\text{O}$   
What is the quantity of electricity in coulombs needed to reduce 1 mole of  $\text{Cr}_2\text{O}_7^{2-}$  ions?  
(b) Corrosion is essentially an electrochemical phenomenon. Explain it.
8. (a) What are Pseudo first order reactions? Give one example of such reactions.  
(b) What is the unit of rate constant for this type of reaction.
9. Show that for a first order reaction, the time required for 99.9% of the reaction is about ten times required for completion of half of the reaction.
10. (a) What is the order & molecularity of the following elementary reaction:  
 $2\text{A} + \text{B} \rightarrow \text{D}$ ; the rate law expression is  $r = k [\text{A}]^{1/2} [\text{B}]$ ?  
(b) How does a catalyst affect the rate of a chemical reaction?
11. Account for the following:  
(a) Methylamine in water reacts with ferric chloride to give a precipitate of ferric hydroxide  
(b) Aniline does not undergo Friedel Crafts reaction
12. (a) Arrange the following in the increasing order of  $\text{p}K_b$  value:  
 $\text{C}_2\text{H}_5\text{NH}_2$ ,  $\text{C}_6\text{H}_5\text{NHCH}_3$ ,  $(\text{C}_2\text{H}_5)_2\text{NH}$ ,  $\text{C}_6\text{H}_5\text{NH}_2$   
(b) How can you distinguish between p-chloro aniline and anilinium hydrochloride?
13. (a) Name one substance which acts as both  
(i) Analgesics and antipyretic (ii) Antiseptic and disinfectant  
(b) Explain broad spectrum antibiotics with suitable example.
14. What happens when ethanol is heated with concentrated sulphuric acid at  $413\text{K}$ ? Explain the mechanism of this reaction.
15. Give a chemical test to distinguish between the following pairs:  
(a) 2-butanol and 2-methyl-2-propanol (b) Phenol and benzoic acid



11. Explain the role of the following :

- (a)  $\text{SiO}_2$  in the extraction of copper from copper matte.
- (b)  $\text{NaCN}$  in the extraction of silver.
- (c) Graphite in the electrometallurgy of aluminium.

12. Outline the principles behind the refining of metals by the following methods :

- (a) Zone refining
- (b) Vapour phase refining
- (c) Chromatographic method.

13. Explain why

- (a)  $\text{Cr}^{2+}$  is a stronger reducing agent than  $\text{Fe}^{2+}$ .
- (b) Many copper (I) compounds are unstable in aqueous solution.
- (c) Lanthanoid elements occur together in nature & difficult to separate.

14. (a) Write the electronic configuration of central metal ion,  $\text{Fe}^{2+}$  in an octahedral complex for a strong ligand field according to crystal field theory.

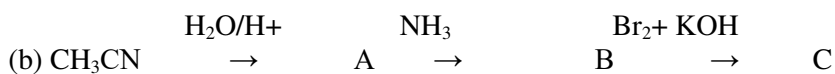
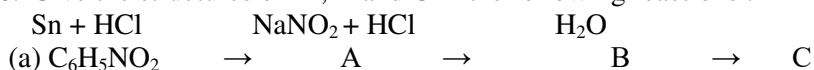
(b) Why is geometrical isomerism not possible in tetrahedral complexes having two different types of unidentate ligands coordinated with the central metal ion?

- (c) Explain:  $[\text{Cu}(\text{en})_2]^{2+}$  is more stable than  $[\text{Cu}(\text{H}_2\text{O})_4]^{2+}$ .

15. Give a chemical test to distinguish between :

- (a)  $\text{HCOOH}$  &  $\text{CH}_3\text{COOH}$
- (b) Acetophenone & benzophenone.
- (c) Acetaldehyde and benzaldehyde.

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



17. Write the names and structures of monomers of

- (a) Natural rubber (b) Nylon 6,6 (c) Buna S

18. (a) Arrange the following polymers in decreasing order of intermolecular forces :

PVC, Nylon-66, Natural rubber

- (b) What is PHBV? Write down the reaction to form PHBV polymer.

19 (a) Explain the following term with suitable example : Anionic detergents

(b) Which class of drugs is used in sleeping pills ?

(c) Why are cimetidine or ranitidine better antacids than  $\text{NaHCO}_3$  or  $\text{Mg}(\text{OH})_2$  or  $\text{Al}(\text{OH})_3$ ?

20. Define the following and give one example of each :

Isoelectric point, Peptide linkage, Mutarotation.

### 4 marks questions

1. Neeta observed that her mother got tired after doing every little work. She took her mother to a doctor. The doctor immediately put her mother on dextrose solution, diagnosed pernicious anemia & gave instructions & medicines. Neeta helped her in household work till she recovered & took her care.

- (a) Name the vitamin whose deficiency causes pernicious anemia.
- (b) What is the common name of 'dextrose'? Draw its open structure.
- (c) Write one important difference between starch and cellulose.
- (d) Mention the values shown by Neeta.

### 5 marks questions

1. (a) Define the following terms :

- (i) Molal elevation constant
- (ii) Azeotrope

(b) A 5 % solution (by mass) of cane sugar is isotonic with 0.877 % solution of substance X. Find the molecular weight of X.

2. (a) The resistance of a conductivity cell containing 0.001 M KCl solution at 298 K is 1500 ohm. What is the cell constant if conductivity of 0.001 M KCl solution at 298 K is  $0.146 \times 10^{-3} \text{ S cm}^{-1}$  ?

(b)  $\Lambda_m^0$  for NaCl, HCl and NaAc are 126.4, 425.9 and 91.0  $\text{S cm}^2 \text{ mol}^{-1}$  respectively. Calculate  $\Lambda_m^0$  for HAc.

3.(a) What is known as activation of energy ? How is it affected by the use of a catalyst ?

(b) In a pseudo first order hydrolysis of ester in water, the following results were obtained

Time (s)	0	30	60	90
Ester (M)	0.55	0.31	0.17	0.085

(i) Calculate the average rate of reaction between the time interval 30 to 60 seconds.

(ii) Calculate the pseudo first order rate constant for the hydrolysis of the ester from the given data.

4. (a) Arrange the following in decreasing order of property indicated :

- (i)  $\text{H}_2\text{O}$  ,  $\text{H}_2\text{S}$  ,  $\text{H}_2\text{Se}$  ,  $\text{H}_2\text{Te}$  (boiling point)
- (ii)  $\text{F}_2$  ,  $\text{Cl}_2$  ,  $\text{Br}_2$  ,  $\text{I}_2$  (bond energy)





