

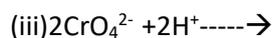
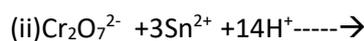
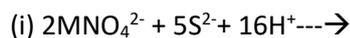
Chemistry

Class XII

1. Define the following terms: Molarity, Molality, Normality, Henry's law, Raoult's law, Ideal solution, Nonideal solution, Azeotropes, Relative lowering of vapour pressure, Elevation in boiling point, Depression in freezing point, Osmotic pressure, Van't Hoff factor, Abnormal molar mass.
2. What type of a battery is lead storage battery? Write the anode and cathode reaction.
3. Differentiate between order of reaction and molecularity of reaction.
4. Define the following terms: Amorphous solids, crystalline solids, Point defects, Unit cell, Coordination number.
5. What do you understand by the rate law and rate constant of a reaction?
6. Define the following: Molar conductivity, Limiting molar conductivity, Kohlrausch law.
7. Distinguish between the following:
 - (i) Physisorption and chemisorption
 - (ii) Absorption and adsorption
 - (iii) Lyophilic colloids and Lyophobic colloids
 - (iv) Multimolecular, macromolecular and associated colloids.
8. Define the following: Ultrafiltration, Electrophoresis, Coagulation, Hardy-Schulze rule, Emulsion, Emulsifying agent.
9. Explain the following terms: Zone refining, Vapour phase refining, Leaching, Froth floatation, leaching, Copper matte.
10. Give the reason of the following:
 - (i) Cryolite is used in the extraction of Aluminium.
 - (ii) CO is used in the extraction of nickel.
 - (iii) NaCN is used in extraction of silver.
11. Give the reasons of the following:
 - (i) Electron gain enthalpy of oxygen is less negative than that of sulphur.
 - (ii) Di-oxygen is a gas but sulphur is a solid.
 - (iii) N-N is weaker than P-P.
 - (iv) NO₂ dimerises.
12. Draw the structures of the following: H₂S₂O₇, ClF₃, XeF₄, H₂SO₄, XeOF₄.
13. Complete the following:
 - (i) $\text{NaOH} + \text{Cl}_2 \rightarrow$
 - (ii) $\text{C} + \text{H}_2\text{SO}_4 \rightarrow$
 - (iii) $\text{Cu} + \text{HNO}_3 \rightarrow$
 - (iv) $\text{P}_4 + \text{H}_2\text{O} + \text{NaOH} \rightarrow$
14. Give the reason of the following:
 - (i) Transition metals generally form coloured compounds.
 - (ii) Mn exhibits the highest oxidation state of +7 among 3d series of transition elements.
 - (iii) Transition metals and their compounds show catalytic properties.

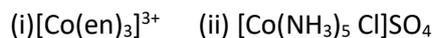
(iv) Transition elements show variable oxidation state.

15. Complete the following reactions:



16. Predict the hybridization of the following: $\text{Ni}(\text{CO})_4$ and $\text{Ni}(\text{CN})_4$.

17. Mention the type of isomerism exhibited by the following:



18 Define the following terms:

(i) Chelating ligands (ii) Ligands (iii) Linkage isomerism

19. Write the chemical reactions involved in the following reaction :

Swarts reaction, Sandmeyer's reaction, Fittig reaction, Finkelstein reaction, Gatterman reaction, Reimer-Tiemann reaction, Williamson's synthesis, Rosenmund reaction, Stephen reaction, Etard reaction, Hell-Volhard-Zelinsky reaction, Gabriel phthalimide synthesis, Hoffman bromamide degradation reaction, coupling reaction.

20. Give the reactions for the following: Aldol condensation, Cannizzaro reaction, cross aldol condensation, Tollens test, Fehling test.

21. Give the mechanism of the following reactions:

(i) Acid catalysed dehydration of an alcohol forming an alkene.

(ii) Acid catalysed hydration of an alkene forming an alcohol.

22. Explain the following: (i) Racemic mixture (ii) Enantiomers (iii) Walden inversion

23. Differentiate between $\text{S}_\text{N}1$ and $\text{S}_\text{N}2$ reaction mechanism.

24. Account for the following:

(i) C-X bond of haloarenes is less polar than C-X bond of haloalkanes.

(ii) Carboxylic acid does not show the nucleophilic addition reaction.

(iii) Aldehydes are more reactive than ketones towards nucleophile.

(iv) Alcohols and ethers of comparable molecular mass have different boiling points.

(v) Chloroform is stored in dark coloured bottles.

25. Give the chemical tests to distinguish between the following: (i) Benzaldehyde and benzoic acid

(ii) Propanal and propanone (iii) Pentan-2-one and Pentan-3-one

26. Give the chemical test to distinguish between :

(i) Benzoic acid and phenol (ii) Acetophenone and benzophenone

27. Explain the following:

Nucleotide, Nucleosides, amphoteric behaviour of amino acids, essential amino acids.

28. Differentiate between the following:

(i) Natural and synthetic polymer (ii) Biodegradable and non biodegradable polymer.

29. Give one use of each: (i) DDT (ii) CCl_4 (iii) Iodoform

30. An organic compound with molecular formula $\text{C}_6\text{H}_6\text{O}$ gives a characteristic colour with FeCl_3 . When A is treated with NaOH and CO_2 at 400K under pressure, compound B is obtained. Compound B on acidification gives compound C. Deduce the structure of A, B and C.

31. Indicate the electrophilic and nucleophilic centres in acetaldehyde.

32. An organic compound A ($\text{C}_2\text{H}_3\text{N}$) is used as a solvent of choice for many organic reactions because it is not reactive in mild acidic and basic conditions. Compound A on treatment with Ni/H_2 forms B. When B is treated with nitrous acid at 273K, ethanol is obtained. When B is warmed with chloroform and NaOH , a foul smelling compound C is formed. Identify A, B and C.

33. An organic compound [A] $\text{C}_3\text{H}_6\text{O}_2$ on reaction with ammonia followed by heating yields B. Compound B on reaction with Br_2 and alc. NaOH gives compound C ($\text{C}_2\text{H}_7\text{N}$). Compound C forms a foul smelling compound D on reaction with chloroform and NaOH . Identify A, B, C, D and write the equations of reactions involved.

34. An element with density 11.2 gcm^{-3} forms a fcc lattice with edge length of $4 \times 10^{-8} \text{ cm}$. Calculate the atomic mass of the element. (Given $N_A = 6.022 \times 10^{23} / \text{mol}$.)

35. The conductivity of 0.001M acetic acid is $4 \times 10^{-5} \text{ S/cm}$. Calculate the dissociation constant of acetic acid, if molar conductivity at infinite dilution for acetic acid is $390 \text{ Scm}^2/\text{mol}$.

36. Explain: (i) Peptide linkage (ii) Glycosidic linkage (iii) Anomers

37. Write the formula and IUPAC name of Aspirin.

38. What type of drug is chloramphenicol?

39. Give two examples of antidepressants.

40. Write the structure of the monomer of: (i) Nylon-6 (ii) Nylon-6

41. Write the IUPAC name of the following: $(\text{CH}_3)_3\text{CCH}_2\text{Br}$.

42. What happens when: (i) cumene is oxidised and the product formed is treated with dil. acid.

(ii) Phenol is oxidised with chromic acid

43. Arrange the following in the increasing order of the given property indicated.

(i) $\text{C}_2\text{H}_5\text{NH}_2$, $(\text{C}_2\text{H}_5)_2\text{NH}$, $(\text{C}_2\text{H}_5)_3\text{N}$ and NH_3 , (Basic strength in aqueous solution).

(ii) $\text{C}_2\text{H}_5\text{NH}_2$, $(\text{C}_2\text{H}_5)_2\text{NH}$, $(\text{C}_2\text{H}_5)_3\text{N}$ and CH_3NH_2 . (Basic strength in gaseous phase).

44. Explain why:

(i) alkylamines are more basic than ammonia

(ii) aniline does not undergo Friedel-Crafts reaction.

45. A first order reaction is 20% complete in 10min. Calculate the time for 75% completion of the reaction.

46. A reaction is of second order with respect to a reactant. How is the rate of the reaction affected if concentration of the reactant is (i) doubled (ii) reduced to half.

47. Mention one consequence of Lanthanoid Contraction.

48. What is the shape of chromate ions?

49. What happens when:

(i) HCl is added to MnO_2

(ii) PCl_5 is heated

50. Sulphur in vapour state exhibits the paramagnetic behaviour. Explain.