QB365 Student Learing Managemnet System
Exam Name: Pre Quarterly - Practice
Std: 12th Standard - Chemistry
Chapter: Solutions, d- and f- Block Elements, Electrochemistry, Haloalkanes and Haloarenes, Alcohols , Phenols and Ethers

Visit QB365-SLMS - https://www.qb365.in/slms/ Complete Questions and Answers

Questions:

Case Study Questions

1. Read the passage given below and answer the following questions:
The f-block elements are those in which the differentiating electron enters the (n -2) forbital. There are two series of f-block elements corresponding to filling of 4f and 5f-orbitals. The series of 4f- orbitals is called lanthanides. Lanthanides show different oxidation states depending upon stability of f^0, f^7 and f^{14} configurations, though the most common oxidation states is +3. There is a regular decrease in size of lanthanides ions with increase in atomic number which is known as lanthanide contraction.
The following questions are multiple choice questions. Choose the most appropriate answer:
(i) The atomic numbers of three lanthanide elements X, Y and 2 are 65, 68 and 70 respectively, their Ln^{3+} electronic configuration is

(a) $4f^8$, $4f^{11}$, $4f^{13}$	(b) $4f^{11}$, $4f^8$, $4f^{13}$	(c) $4f^o$, $4f^2$, $4f^{11}$	(d) $4f^3$, $4f^7$, $4f^9$

(ii) Lanthanide contraction is observed in

(a) Gd	(b) At	(c) Xe	(d) Te

(iii) Name a member of the lanthanoid series which is well known to exhibit +4 oxidation state.

(a) Cerium (Z = 58)	(b) Europium (Z = 63)	(c) Lanthanum (Z = 57)	(d) Gadolinium (Z = 64)

(iv) Identify the incorrect statement among the following.

(a) Lanthanojd contraction is the accumulation of successive shrinkages.
(b) The different radii of Zr and Hf due to consequence of the lanthanoid contraction.
(c) Shielding power of 4f electrons is quite weak.
(d) There is a decrease in the radii of the atoms or ions as one proceeds from La to Lu.

2. Read the passage given below and answer the following questions:
Nucleophilic substitution reactions are of two types; substitution nucleophilic bimolecular (S_N2) and substitution nucleophilic unimolecular (S_N1) depending on molecules taking part in determining the rate of reaction. Reactivity of alkyl halide towards S_N1 and S_N2 reactions depends on various factors such as steric hindrance, stability of intermediate or transition state and polarity of solvent. S_N2 reaction mechanism is favoured mostly by primary alkyl halide then secondary and then tertiary. This order is reversed in case of S_N1 reactions.
The following questions are multiple choice questions. Choose the most appropriate answer:
(i) Which of the following is most reactive towards nucleophilic substitution reaction?

(a) C_6H_5Cl	(b) $CH_2 = CHCl$	(c) $ClCH_2CH = CH_2$	(d) $CH_3CH = CHCl$

(ii) Isopropyl chloride undergoes hydrolysis by

(a) $S_N1$mechanism	(b) $S_N2$mechanism	(c) S_N1 and $S_N2$mechanism	(d) neither S_N1 and $S_N2$mechanism

(iii) The most reactive nucleophile among the following is

(a) CH_3O^-	(b) $C_6H_5O^-$	(c) $(CH_3)_2CHO^-$	(d) $(CH_3)_3CO^-$

(iv) Tertiary alkyl halides are practically inert to substitution by $S_N2$mechanism because of

(a) insolubility	(b) instability	(c) inductive effect	(d) stearic hindrance.

5 Marks

3. Define the following terms: (i) Mole fraction (ii) Molality (iii) Molarity (iv) Mass percentage.

4. Write the structure of the following compounds:
(i) 2-Chloro-3-methylpentane
(ii)1-Chloro-4-ethylcyclohexane
(iii) 4-tert-Butyl-3-iodoheptane
(iv)1,4-Dibromobut-2-ene
(v)1-Bromo-4-butyl-2-methylbenzene.

5. Write structures of the compounds whose IUPAC names are as follows:
(i) 2-Methylbutan-2-ol
(ii) 1-Phenylpropan-2-ol
(iii) 3,5-Dimethylhexane –1, 3, 5-triol
(iv) 2,3 – Diethylphenol
(v) 1 – Ethoxypropane
(vi) 2-Ethoxy-3-methylpentane
(vii) Cyclohexylmethanol
(viii) 3-Cyclohexylpentan-3-ol
(ix) Cyclopent-3-en-1-ol
(x) 4-Chloro-3-ethylbutan-1-ol.

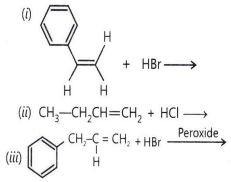
3 Marks

6. The vapour pressure of water is 12.3 kPa at 300 K. Calculate vapour pressure of 1 molal solution of a non-volatile solute in it.

7. Indicate the steps in the preparation of :
(a) $K_2Cr_2O_7$ from chromite ore.
(b) $KMnO_4$ from pyrolusite ore.

8. Give the equations of reaction for the preparation of phenol from cumene.

9. Write the products of the following reactions:



10. Write the equations involved in the following reactions:
    (i) Reimer-Tiemann reaction
    (ii) Williamson synthesis

11. Write structures of different dihalogen derivatives of propane.

12. Using the standard electrode potentials given in the table, predict if the reaction between the following is feasible.
    (A) $Fe^{3+}_{(aq)}$ and $I^-_{(aq)}$
    (B) $Ag^+_{(aq)}$ and $Cu_{(s)}$
    (C) $Fe^{3+}_{(aq)}$ and $Br^-_{(aq)}$
    (D) $Ag_{(s)}$ and $Fe^{3+}g)$
    (E) $Br_{2(aq)}$ and $Fe^{2+}_{(aq)}$.

2 Marks

13. State Henry's law and mention some important applications.

14. Why is the highest oxidation state of a metal exhibited in its oxide or fluoride only?

15. If a current of 0.5 ampere flows through a metalic wire for 2 hours, then how many electrons flow through the wire?

16. Which compound in each of the following pairs will react faste in S_N2 reaction with OH^-?
    (a) CH_3Br or CH_3I
    (b) $(CH_3)_3CCl$ or CH_3Cl

17. Give two reactions that show the acidic nature of phenol. Compare its acidity with that of ethanol.

Multiple Choice Question

18. 200 mL of water is added to 500mL of 0.2 M solution. What is the molarity of the dilluted solution ?
    (a) 0.5010 M (b) 0.2897 M (c) 0.7093 M (d) 0.1428 M

19. An aqueous solution of methanol in water has vapour pressure
    (a) equal to that of water (b) equal to that of methanol (c) more than that of water (d) less than that of water

20. A 5% solution of cane sugar (molar mass 342) is Isotonic with 1% of a solution of an unknown solute. The molar mass of unknown solute in g/mol is
    (a) 136.2 (b) 171.2 (c) 68.4 (d) 34.2

21. Van't Hoff factor for 0.1 M ideal solution is
    (a) 0.1 (b) 1 (c) -0.01 (d) none of these

22. At equilibrium the rate of dissolution of a solid solute in a volatile liquid solvent is.....
    (a) less than the rate of crystalisation (b) greater than the rate of crystallisation (c) equal to the rate of crystalisation (d) zero

23. The unit of ebullioscopic constant is _____.
    (a) K kg mol^{-1} or K $(molality)^{-1}$ (b) mol kg K^{-1} or K^{-1} (molality) (c) kg mol^{-1} K^{-1} or K^{-1} $(molality)^{-1}$ (d) K mol kg^{-1} or K (molality)

24. We have three aqueous solutions of NaCl labelled as 'A', 'B' and 'C' with concentrations 0.1 M, 0.01 M, respectively. The value of van't Hoff factor for these solutions will be in the order ..... .
    (a) $i_A < i_B < i_C$ (b) $i_A > i_B > i_C$ (c) $i_A = i_B = i_C$ (d) $i_A < B > i_C$

25. Which of the following possess physical state of solute and solvent as liquid and solid respectively?
    (a) Solution of sugar in water (b) Zinc amalgam (c) Solution of naphthalene in benzene (d) Brass

26. Which of the following is an example of a solid solution?
    (a) Sea water (b) Sugar solution (c) Smoke (d) 22 carat gold

27. Who invented the galvanic cell?
    (a) Galvani and Volta (b) Henry Cavendish (c) Joseph Priestley (d) Antoine Lavoisier

28. Which of the following electrolytes is not preferred in a salt bridge?
    (a) KCl (b) KNO_3 (c) NH_4NO_3 (d) NaCl

29. Find the number of electrons transferred in the equation:
    $Cu_{(g)} + 2Ag^+(aq) \rightarrow Cu^{2+}_{(aq)} + 2Ag_{(s)}$
    (a) 4 (b) 3 (c) 2 (d) 1

30. Two materials other than hydrogen that can be used asfuels in fuel cell are
    (a) ethane and methanol (b) methane and ethanal (c) methane and methanol (d) phenol and methane

31. Name the element of lanthanoids series which is well known for its +4 oxidation state.
    (a) Ce (b) Pr (c) Nd (d) Pu

32. The name inner transition metals is often used to refer to the:
    (a) lanthanoids (b) actinoids (c) both lanthanoids and actinoids (d) d-block elements

33. $KMnO_4$ is coloured due to:
    (a) d-d transitions. (b) charge transfer from ligand to metal. (c) unpaired electrons in d orbital of Mn. (d) charge transfer from metal to ligand.

QB™ 365 Study Material
QUESTION BANK 365