CBSE 12th Chemistry 2010 Unsolved Paper
Delhi Board

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TIME - 3HR. | QUESTIONS - 30

THE MARKS ARE MENTIONED ON EACH QUESTION

SECTION – A

Q. 1. Write a feature which will distinguish a metallic solid from an ionic solid. *1 mark*

Q. 2. Define 'order of a reaction'. *1 mark*

Q. 3. What is an emulsion? *1 mark*

Q.4. What are different oxidation states exhibit by lanthanides? . *1 mark*

Q. 5. Give an example of linkage isomerism? .*1 mark*

Q. 6. A Solution of KOH hydrolyses $CH_3CHClCH_2CH_3$ and $CH_3CH_2CH_2CH_2Cl$. Which one of these is more easily hydrolyzed? *1 mark*

Q. 7. Draw the structural formula of 1-phenyl Propan-1-one molecule. *1 mark*

Q. 8. Give the IUPAC name of $H_2N - CH_2 - CH_2 - CH = CH_2$. *1 mark*

SECTION – B

Q. 9. Non-ideal solutions exhibit either positive or negative deviations from Raoult's law. What are these deviations and why are they caused? Explain with one example for each type. *2 marks*

Q. 10. A reaction is of first order in reactant A and of second order in reactant B. How is the rate of this reaction affected when (i) the concentration of B alone is increased to three times (ii) the concentrations of A as well as B are doubled? *2 marks*

Q. 11. For a first order reaction, time taken for half of the reaction to complete t_1 and $\frac{3}{4}$ of the reaction to complete is t_2. How are t_1 and t_2 related? *2 marks*

Q. 12. Draw the structures of white phosphorus and red phosphorus. Which one of these two types of phosphorus is more reactive and why? *2 marks*

Q. 13. Explain the following observations: *2 marks*

(i) Generally there is an increase in density of elements from titanium (Z = 22) to copper (Z = 29) in the first series of transition elements.

(ii) Transition elements and their compounds are generally found to be good catalysts in chemical reactions.

Q. 14. Name the following coordination compounds according to IUPAC system of nomenclature: *2 marks*

(i) $[Co(NH_3)_4(H_2O)Cl]Cl_2$

(ii) $[CrCl_2(en)_2Cl, (en = ethane - 1,2 - diamine)$

Q. 15. Illustrate the following reactions giving a chemical equation for each: *2 marks*

(i) Kolbe's reaction,

(ii) Williamson synthesis.

Q. 16. How are the following conversions carried out? *2 marks*

(i) Benzyl chloride to benzyl alcohol,

(ii) Methyl magnesium bromide to 2-methylpropan-2-ol.

Q. 17. Explain the following terms. *2 marks*

(i) Invert sugar

(ii) Polypeptides

Q. 18. While antacids and antiallergic drugs interface with the function of histamines but why do there not interface with the function of each other? *2 marks*

SECTION – C

Q. 19. The well known mineral fluorite is chemically calcium fluoride. It is known that in one unit cell of this mineral there are 4 Ca^{2+} ions and 8 F^- ions and that Ca^{2+} ions are arranged in a fcc lattice. The F^- ions fill all the tetrahedral holes in the face centred cubic lattice of Ca^{2+} ions. The edge of the unit cell is 5.46×10^{-8} cm in length. The density of the solid is 3.18 g cm^{-3}. Use this information to calculate Avogadro's number (Molar mass of CaF_2 = 78.08 g mol^{-1}) *3 marks*

Q. 20. A solution prepared by dissolving 1.25 g of oil of winter green (methyl salicylate) in 99.0 of benzene has a boiling point of 80.31 °C. Determine the molar mass of this compound. (B.P. of pure benzene = 80.10 °C and K_b for benzene = 2.53 °C kg mol^{-1}) *3 marks*

Q. 21. What is the difference between multimolecular and macromolecular colloids? Give one example of each type. How are associated colloids different from these two types of colloids? *3 marks*

Q. 22. Describe how the following changes are brought about: *3 marks*

(i) Pig iron into steel.
(ii) Zinc oxide into metallic zinc.
(iii) Impure titanium into pure titanium.

Or

(i) NaCN in the extraction of gold from gold ore.
(ii) SiO_2 in the extraction of copper from copper matter.
(iii) Iodine in the refining of zirconium

Write chemical equations for the involved reactions.

Q. 23. How would your account for the following? *3 marks*

(i) The atomic radii of the metals of the third (5d) series of transition elements are virtually the same as those of the corresponding members of the second (4d) series.

(ii) The E^0 value for the Mn^{3+}/Mn^{2+} couple is much more positive than that for Cr^{3+}/Cr^{2+} couple or Fe^{3+}/Fe^{2+} couple.

(iii) The highest oxidation state of a metal is exhibited in its oxide or fluoride.

Q. 24. (i) State one use each of DDT and iodoform. *3 marks*

(ii) Which compound in the following couples will react faster in $S_N{}^2$ displacement and why?

(a) 1-Bromopentane or 2-bromopentane

(b) 1-Bromo-2-methylbutane or 2-bromo-2-methylbutane.

Q. 25. Arrange the following in order of property indicated for each set. *3 marks*

(i) F_2, Cl_2, Br_2, I_2 incresing bond dissociation enthalpy.

(ii) HF, HCL, HBr, HI increasing acid strength.

(iii) NH_3,$PH_3, ASH_3, SbH_3, BiH_3$ Increasing base strength.

Q. 26. Give one example each of. *3 marks*

(i) addition polymers,

(ii) condensation polymers,

(iii) copolymers.

Q. 27. What are analgesic medicines? How are they c1assifiedand when are they commonly recommended for use? *3 marks*

SECTION – D

Q. 28. (a) State Kohlrausch law of independent migration of ions. Write an expression for the molar conductivity of acetic acid at infinite dilution according to Kohlrausch law. *5 marks*

(b) Calculate: $\Lambda^0{}_m$ *for acetic acid*

Given that: $\Lambda^0{}_m(\text{HCl}) = 426\ \text{S}\ cm^2\ mol^{-1}$

$\Lambda^0{}_m(\text{NaCl}) = 126\ \text{S}\ cm^2\ mol^{-1}$

$\Lambda^0{}_m(CH_3COONa) = 91\ \text{S}\ cm^2\ mol^{-1}$

Or

(a) Write the anode and cathode reactions and the overall reaction occurring in a lead storage battery.

(b) A copper-silver cell is set up. The copper ion concentrations is 0.10 M. The concentration of silver ion is not known. The cell potential when measured was 0.422 V. Determine the concentration of silver ions in the cell.

$$(Given E^0 Ag^+/Ag = +0.80\,V, E^0 Cu^{2+}/Cu = +0.34V)$$

Q. 29. Complete the following chemical equations: . *5 marks*

(i) $NaOH_{(aq)} + Cl_{2(g)} \longrightarrow$

(Hot and conc.)

(ii) $XeF_6(s) + H_2O(l) \longrightarrow$

(b) How would you account for the following?

(i) The value of election gain enthalpy with negative sign for Sulphur is higher than that for oxygen.

(ii) NF_3 is an exothermic compound but NCl_3 is endothermic compound.

(iii) ClF_3 moleule has a T − shaped structure and not a trigonal planar one.

Or

(a) Complete the following chemical reaction equations:

(i) $P_4 + SO_2Cl_2 \longrightarrow$

(ii) $XeF_4 + H_2O \longrightarrow$

(b) Explain the following observations giving appropriate reasons:

(i) The stability of + 5 oxidation state decreases down the group in group 15 of the periodic table.

(ii) Solid phosphorus pentachloride behaves as an ionic compound.

(iii) Halogens are strong oxidizing agents.

Q. 30. (a) Explain the mechanism of a nucleophilic attack on the carbonyl group of an aldehyde or a ketone. *5 marks*

(b) An organic compound (A) (molecular formula $C_8H_{16}O_2$) was hydrolysed with dilute sulphuric acid to give a carboxylic acid (B) and an alcohol (C). Oxidation of (C) with chromic acid also produced (B). On dehydration (C) gives but-1-ene. Write the equations for the reactions involved.

Or

(a) Give chemical tests to distinguish between the following pairs of compounds:

(i) Ethanal and propanal

(ii) Phenol and Benzoic acid

(b) How will you bring about the following conversions?

(i) Benzoic acid to benzaldehyde

(ii) Ethanal to but-2-enal

(iii) Propanone to propene

Give complete reaction in each case.