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CBSE 12th Chemistry 2007 Unsolved Paper Delhi Board

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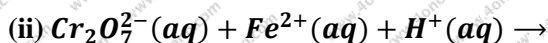
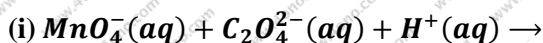
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Q.10. (i) On mixing liquid X and liquid Y, volume of the resulting solution decreases. What type of deviation from Raoult's law is shown by the resulting solution? What change in temperature would be observed after mixing liquids X and Y? 2 marks

(ii) What happens when we place the blood cell in water (hypotonic solution)? Give reason.

Q.11. Complete the following chemical reaction equations: 2 marks



Q. 12. A first order decomposition reaction takes 40 minutes for 30% decomposition. Calculate its $t_{1/2}$ value. 2 marks

Q. 13. 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.14. Which methods are usually employed for purifying the following metals: 2 marks

(i) Nickel

(ii) Germanium

Q.15. An element crystallizes in b.c.c. lattice with cell edge of 500 pm. The density of the element is 7.5 g cm^{-3} . How many atoms are present in 300 g of the element. 2 mark

Q. 16. Calculate the equilibrium constant, K for the reaction at 298 K, $Zn(s) + Cu^{2+}(aq) \rightleftharpoons Zn^{2+}(aq) + Cu(s)$ Given: $E_{Zn^{2+}/Zn}^0 = -0.76 \text{ V}$ $E_{Cu^{2+}/Cu}^0 = +0.34 \text{ V}$. 2 marks

Q.17. Write the dispersed phase and dispersion medium of the following colloidal system: 2 mark

(i) Smoke

(ii) Milk

OR

What are lyophobic and lyophilic colloids? Which of these sols can be easily coagulated on the addition of small amounts of electrolytes?

Q.18. Write the name and structures of the monomers of the following polymers: 3 marks

(i) Nylon-6, 6

(ii) PHBV

(iii) Neoprene

SECTION – C

Q.19. How would you convert the following: 3 marks

- (i) Phenol to benzoquinone
- (ii) Propanone to 2-methylpropan-2-ol
- (iii) Propene to propan-2-ol

Q. 20. What are lyophilic and lyophobic sols? Give one example of each type. Which one of these two types of sols is easily coagulated and why? 3 marks

Q.21. The reaction, $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$ contributes to air pollution whenever a fuel is burnt in air at a high temperature. At 1500 K, equilibrium constant K for it is 1.0×10^{-5} . Suppose in a case $[N_2] = 0.80 \text{ mol L}^{-1}$ and $[O_2] = 0.20 \text{ mol L}^{-1}$ before any reaction occurs. Calculate the equilibrium concentrations of the reactants and the product after the mixture has been heated to 1500 K. 3 marks

Q. 22. How would you 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. 23. How would you account for the following: 3 marks

- (i) Among lanthanoids, Ln(III) compounds are predominant, However, occasionally in solutions or in solid compounds, +2 and +4 ions are also obtained.
- (ii) The $E_{M^{2+}/M}$ for copper is positive (0.34 V). Copper is the only metal in the first series of transition elements showing this behavior.
- (iii) The metallic radii of the third (5d) series of transition metals are nearly the same as those of the corresponding members of the second series.

Q.24. (a) For the complex $[Fe(H_2O)_6]^{3+}$, write the hybridization, magnetic character and spin of the complex. (At. Number: Fe = 26)

(b) Draw one of the geometrical isomers of the complex $[Pt(en)_2Cl_2]^{2+}$ which is optically inactive. 3 marks

Q. 25. Give reasons for the following: 3 mark

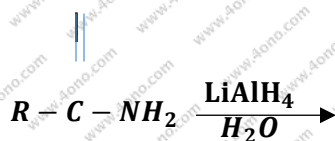
- (i) Where R is an alkyl group, $R_3P = O$ exists but $R_3N = O$ does not
- (ii) $PbCl_4$ is more covalent than $PbCl_2$
- (iii) At room temperature, N_2 is much less reactive. 3 marks

Q. 26. Mr. Roy, the principal of one reputed school organized a seminar in which he invited parents and principals to discuss the serious issue of diabetes and depression in students. They all resolved this issue by strictly banning the junk food in schools and to introduce healthy snacks and drinks like soup, lassi, milk etc. in school canteens. They also decided to make compulsory half an hour physical activities for the students in the morning assembly daily. After six months, Mr. Roy conducted the health survey in most of the schools and discovered a tremendous improvement in the health of students. After reading the above passage, answer the following: *3 marks*

- (i) What are the values (at least two) displayed by Mr. Roy?
- (ii) As a student, how can you spread awareness about this issue?
- (iii) What are tranquilizers? Give an example.
- (iv) Why is use of aspartame limited to cold foods and drinks? *4 marks*

Q.27. Complete the following reaction equations: *3 marks*

(i) O



SECTION – D

Q.28. For the hydrolysis of methyl acetate in aqueous solution, the following result are obtained: *5 marks*

t/s	0	10	20
$CH_3COOCH_3 / mol L^{-1}$	0.10	0.05	0.025

(a) Show that it follows pseudo first order reaction, as the concentration of water remains constant.

(b) Calculate the average rate of reaction between the time interval 10 to 20 seconds.

(Given : $\log 2 = 0.3010$, $\log 4 = 0.6021$)

Or

(a) For a reaction $A + B \rightarrow P$, the rate is given by rate = $k[A][B]^2$

(i) How is the rate of reaction affected in the concentration of B is doubled?

(ii) What is the overall order of reaction if A is present in large excess?

(b) A first order reaction takes 30 minutes for 50% completion. Calculate the time required for 90% completion of the reaction.

Q.29. (a) Draw the molecular structures of the following compounds: *5 marks*

(i) N_2O_5

(ii) $XeOF_4$

(b) Explain the following observations:

(i) Sulphur has a greater tendency for catenation than oxygen.

(ii) ICl is more reactive than I_2 .

(iii) Despite lower value of its electron gain enthalpy with negative sing, fluorine (F_2) is a stronger oxidising agent than Cl_2

Or

(a) Complete the following chemical equations:

(i) $Cu + HNO_3$ (dilute) \rightarrow

(ii) $XeF_4 - O_2F_2 \rightarrow$

(b) Explain the following observations:

(i) Phosphorus has greater tendency for catenation than nitrogen.

(ii) Oxygen is a gas but Sulphur a solid.

(iii) The halogens are colored. Why?

Q.30. A translucent white waxy solid (A) on heating in an inert atmosphere is converted to its allotropic form (B). Allotrope (A) on reaction with very dilute aqueous KOH liberates a highly poisonous gas (c) having rotter fish smell. With excess of chlorine forms (D) which hydrolyses to compound (E). Identify compounds (A) to (E). *5 marks*

OR

(a) What is meant by undictated, bidentate and ambidentate ligands? Give two examples for each.

(b) Calculate the overall complex dissociation equilibrium constant for the $Cu(NH_3)_4^{2+}$ ion, given that β_4 for this complex is 2.1×10^{13} .



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