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CBSE 12th Chemistry 2016 Unsolved Paper Delhi Board

TIME - 3HR. | QUESTIONS - 26

THE MARKS ARE MENTIONED ON EACH QUESTION

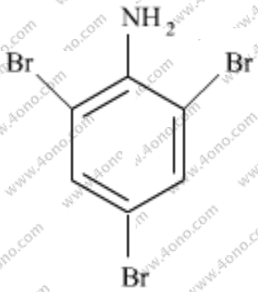
SECTION - A

Q. 1. Out of $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-Cl$ and $CH_3-CH_2-\underset{\underset{CH_3}{|}}{CH}-Cl$, which is more reactive towards S_N1 Reaction and why? *1 mark*

Q. 2. On adding NaOH to ammonium sulphate, a colorless gas with pungent odour is evolved which forms a blue coloured complex with Cu^{2+} ion. Identify the gas. *1 mark*

Q. 3. What type of magnetism is shown by a substance if magnetic moments of domains are arranged in same direction? *1 mark*

Q. 4. Write the IUPAC name of the given compound: *1 mark*



Q. 5. Write the main for reason for the stability of colloidal sols. *1 mark*

SECTION - B

Q.6. From the given cells:
Lead storage cell, mercury cell, fuel cell and Dry cell.
Answer the following:

(i) Which cell is used in hearing aids?
(ii) Which cell was used in Apollo space programme?
(iii) Which cell is used in automobiles and inverters?
(iv) Which cell does not have long life? *2 marks*

Q.7. When chromite ore $FeCr_2O_4$ is fused with NaOH in presence of air, a yellow coloured compound (A) is obtained which on acidification with dilute sulphuric acid gives a compound (B). Compound (B) on reaction with KCl forms a orange coloured crystalline compound (C). *2 marks*

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(i) Write the formula of the compounds (A), (B) and (C).

(ii) Write one use of compound (C).

Or

Complete the following chemical equations:

(i) $8MnO_4^- + 3S_2O_3^{2-} + H_2O \longrightarrow$

(ii) $Cr_2O_7^{2-} + 3Sn^{2+}14H^+ \longrightarrow$

Q. 8. When a co-ordination compound $CrCl_3.6H_2O$ is mixed with $AgNo_3$, 2 moles of AgCl are precipitated per mole of the compound. Write. *2 marks*

(i) Structural formula of the complex.

(ii) IUPAC name of the complex.

Q. 9. For a reaction:

$$2NH_3(g) \xrightarrow{Pt} N_2(g) + 3H_2(g) Rate = k$$

(i) Write the order and molecularity of this reaction.

(ii) Write the unit of K. *2 marks*

Q. 10. Write the mechanism of the following reaction *2 marks*

$$2CH_3CH_2OH \xrightarrow[413K]{conc.\ H_2So_4} CH_3CH_2 - O - CH_2 - CH_3$$

SECTON - C

Q. 11. Give reasons:

(i) $C - Cl$ bond length in chlorobenzene is shorter than $C - Cl$ bond length in $CH_3 - Cl$

(ii) The dipole moment of chlorobenzene is lower than that of cyclohexyl chloride.

(iii) S_N1 reactions are accompanied by racemization in optically active alkyl halides. *3 marks*

Q.12. An element crystallizes in a f.c.c lattice with cell edge of 250 pm. Calculate the density if 300 g of element contain 2×10^{24} atoms. *3 marks*

Q.13. The rate constant for the first order decomposition of H_2O_2 is given by the following equation: $log\ K = 14.2 - \frac{1.0\times10^4}{T}\ K$

Calculate E_a for this reaction and rate constant k if its half life period be 200 minutes. (Given: R = 8.314 $JK^{-1}mol^{-1}$). *3 marks*

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Q. 14. (i) Differentiate between adsorbtion and absorption.

(ii) Out of $MgCl_2$ and $AlCl_3$, which one is more effective in causing coagulation of negatively charged sol and why?

(iii) Out of Sulphur sol and proteins, which one forms multimolecular colloids? *3 marks*

Q. 15. (i) Name the method of refining of metals such as germanium.

(ii) In the extraction of Al, impure Al_2O_3 is dissolved in conc. NaOH to form sodium aluminate and leaving impurities behind. What is the name of this process?

(iii) What is the role of coke in the extraction of iron from its oxides? *3 marks*

Q. 16. Calculate e.m.f of the following cell at 298K: *3 marks*

$$2Cr(s) + 3Fe^{2+}(0.1M) \longrightarrow 2Cr^{3+}(0.01M) + 3Fe(s)$$

Given : $E^0(Cr^{3+}|Cr) = -0.74V$ $E^0(Fe^{2+}|Fe) = -0.44V$

Q. 17. Give reasons:

(I) Mn shows the highest oxidation state of +7 with oxygen but with fluorine it shows the highest oxidation state of +4.

(ii) Transition metals show variable oxidation states.

(iii) Actinoids show irregularities in their electronic configuration. *3 marks*

Q. 18. Write the main product (s) in each of the following reaction: *3 marks*

(i)

$$CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-O-CH_3 + HI \longrightarrow$$

(ii)

$$CH_3-CH=CH_2 \xrightarrow[(ii)3H_2O_2/OH^-]{(i)B_2H_6}$$

(iii)

$$C_6H_5-OH \xrightarrow[(ii)CO_2,H^+]{(i)aq.NaOH}$$

Q. 19. Write the structures of A, B and C in the following: *3 marks*

(i)

$$C_6H_5-CONH_2 \xrightarrow{Br_2/aq.KOH} A \xrightarrow[0\text{-}5^oC]{NaNO_2+HCl} B \xrightarrow{KI} C$$

(ii)

$$CH_3-Cl \xrightarrow{KCN} A \xrightarrow{LiAlH_4} B \xrightarrow[\Delta]{CHCl_3+\text{alc. }KOH} C$$

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Q. 20. (I) What is the role of t-butyl peroxide in the polymerization of ethene?

(ii) Identify the monomers in the following polymer:

$$NH-(CH_2)_6-NH-CO-(CH_2)_4-CO_n$$

(iii) Arrange the following polymers in the increasing order of their intermolecularforces: Polystyrene, Terylene, Buna-S. *3 marks*

OR

Write the mechanism of free radical polymerization of ethane.

Q. 21. (i) Write the name of two monosaccharides obtained on hydrolysis of lactose sugar.
(ii) Why Vitamin C cannot be stored in our body?
(iii) What is the difference between a nucleoside and nucleotide? *3 marks*

Q.22. (a) For the complex $[Fe(CN)_6]^{3-}$, write the hybridization type, magnetic character and spin nature of the complex. (At. number: Fe = 26).

SECTION - D

Q.23. Due to hectic and busy schedule, Mr. Angad made his life full of tensions and anziety. He started taking pills to overcome the depression without consulting the doctor Mr. Deepak, a close friends of Mr. Angad, Advised him to stop taking sleeping pills and suggested to changes his lifestyle by doing yoga, meditation and some physical exercise. Mr. Angad followed his friend's advice and after few days he started feeling better. *4 marks*

After reading the above passage, answer the following:
(i) What are the value (at least two) answer the following:
(ii) Why is it not advisable to take sleeping pills without consulting doctor?
(iii) What are tranquilizers? Give two examples.

SECTION - E

Q.24. (a) Account for the following: *5 marks*
(i) Ozone is thermodynamically unstable.
(ii) Solid PCl_5 is ionic in nature.
(iii) Fluorine forms sonly one oxoacid HOF.
(b) Draw the structure of
(i) BrF_5
(ii)XeF_4

OR

(i) Compare the oxidizing action of F_2 and Cl_2 by considering parameters such as bind dissociation enthalpy, electron gain enthalpy and hydration enthalpy.

(ii) Write the condition to maximize the yield of $H_2SO_4$by contact process.

(iii) Arrange the following in the increasing order property mentioned :
(a) H_3PO_3, H_3PO_4 , H_3PO_2 (Reducing character)

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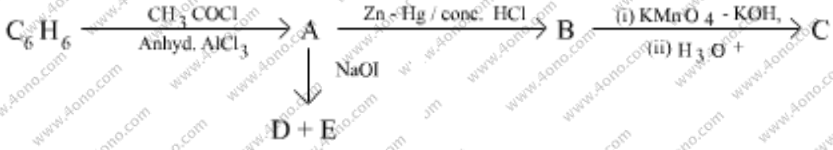
(b) NH_3, PH_3, AsH_3, SbH_3, BiH_3 (Base strength)

Q. 25. Write the structures of A, B, C, D and E in the following reactions: *5 marks*



Or

(a) Write the chemical equation for the reaction involved in Cannizzaro reaction.

(b) Draw the structure of the semicarbazone of ethanol.

(c) Why pKa of $F - CH_2 - COOH$ is lower than that of $Cl - CH_2 - COOH$?

(d) Write the product in the following reaction

$$CH_3 - CH = CH - CH_2CN \xrightarrow[(ii)H_2O]{(i)DIBAL - H}$$

(e) How can you distinguish between propanal and propanone?

Q. 26. (a) Calculate the freezing point of solution when 1.9 g of $MgCl_2$ ($M = 95\ g\ Mol^{-1}$) was dissolved in 50g of water, assuming $MgCl_2$ undergoes complete ionization. (K_f for water $= 1.86$ K kg mol^{-1}).

(b) (i) Out of 1 M glucose and 2 M glucose, which one has a higher boiling point and why?

(ii) What happens when the external pressure applied become more that the osmotic pressure of solution? *5 marks*

Or

(a) When 2.56 g of Sulphur was dissolved in 100 g of CS_2, the freezing point lowered by 0.383 K. Calculate the formula of sulphur (S_x).

(K_f for $CS_2 = 3.83\ K\ kg\ mol^{-1}$, Atomic mass of sulphur $= 32 g\ mol^{-1}$)

(b) Blood cells are isotomic with 0.9% sodium chloride solution. What happens if we place blood cells in a solution containing.

(i) 1.2% sodium chloride solution?

(ii) 0.4% sodium chloride solution?

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