CHEMISTRY

BOOKS - SUNSTAR CHEMISTRY (KANNADA ENGLISH)

II PUC CHEMISTRY (ANNUAL EXAM QUESTION PAPER MARCH - 2014)

Part A

1. Define the term 'Molarity'.

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2. Mention the enthalpy of mixing $(\Delta_{\text{mix}}H)$ value to form an ideal solution.

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3. What is secondary cell?

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4. For the reaction $2HI \rightarrow H_2 + I_2$ .Write its molecularity.

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5. Write the catalyst used in the decomposition of potassium chlorate to get potassium chloride and oxygen.

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6. Name the refining method used to produce semiconductors.

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7. Give reason for chemical inertness of noble gases.

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8. $CH_3Br + AgF \rightarrow CH_3F + AgBr$. Name the reaction.

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9. Mention the hybridised state of carbonyl carbon.

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10. Which is the nitrogen base present only in RNA but not in DNA ?

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Part B

1. Aluminium crystallizes in an FCC structare. Atomic radius of the metal is 125pm. Calculate the edge length of unit cell of the metal.

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2. What is molar conductivity? How is it related to the conductivity of a solution whose concentration is $Cmolm^{-3}$?

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3. Define collision frequency. Give an example for Pseudo-first order reaction.

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4. What is lanthanoid contraction? Mention the cause for it.

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5. Complete the following reaction:

i) $R - CH_2 - OH \xrightarrow[573K]{Cu}$

ii) $CH_3 - CH = CH_2 + H_2O \xrightarrow{H^+}$

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6. Explain Rosenmund reduction of benzoyl chloride.

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7. What are food preservatives ? Give an example .

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8. Mention a drug which can act, both as an analgesic as well as an antipyretic. Name an artificial sweetening agent.

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Part C

1. Draw labelled diagram of Hall-Heroult electrolytic cell for the extraction of aluminium write anode and cathode reactions.

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2. For the manufacture of Ammonia by Haber's process, write the equation and optimum conditions for maximum yield of ammonia.

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3. Write the equation for

i) The action of SO_2 with chlorine in the presence of charcoal

ii) The actionof SO_3 with concentrated sulphuric acid

iii) The action of ozone with lead sulphide.

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4. Complete the following equation :

i) $\underset{\text{(Cold and dilute)}}{2NaOH} + Cl_2 \rightarrow$

ii) $2FeSO_4 + H_2SO_4 + Cl_2 \rightarrow$

iii) $Cl_2 + \underset{\text{(Excess)}}{3F_2} \rightarrow$

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5. Explain the manufacture of Potassium dichromate from chromite ore.

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6. With reference to the first row transition series:

i) Name the metal which possesses maximum number of oxidation states.

ii) Among Zn^{+2} and Cu^{+2} which is colourless?

iii) Between Ti^{2+} and V^{2+} which ion contains more number of unpaired electrons?

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7. Using valence bond theory account for the geometry and magnetic nature of $[NiCl_4]^{2-}$ ion. (Atomic number of Ni $= 28$).

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8. Give the IUPAC name of $\left[Ti(H_2O)_6\right]^{3+}$. Draw cis and trans isomers of $\left[Pt(NH_3)_2Cl_2\right]$.

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Part D

1. Calculate the packing efficiency in a simple cubic lattice.

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2. What is Frenkel defect? Give an example.

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3. On dissolving 2.34g of non-electrolyte solute in 40g of benzene, the boiling point of solution was higher than benzene by 0.81K. Kb value for benzene is 2.53 K $kgmol^{-1}$ .Calculate the molar mass of solute. [Molar mass of benzene is 78 $gmol^{-1}$]

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4. State Henry's law. Write its mathematical form.

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5. Draw a neat labeled diagram of Standard Hydrogen Electrode (SHE). Write its Half-Cell reaction.

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6. b) Calculate $\Delta_r G^\circ$ for the following reaction:

$Fe^{+2}_{(aq)} + Ag^{+}_{(aq)} \rightarrow Fe^{+3}_{(aq)} + Ag(s).$ $\quad (\text{Given}: \; E^\circ_{\text{cell}} = +0.03V, F =$

.

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7. a) The rate of a particular reaction doubles when the temperature changes from 300 K to 310 K. Calculate the energy of activation of the reaction. [Given : $R = 8.314\,\text{JK}^{-1}\;\;\text{mol}^{-1}$].

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8. b) Show that the half - life period of a first order reaction is independent of initial concentration of reacting species.

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9. Write any two differences between physisorption and chemisorption.

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10. i) Mention the role of alum in the purification of drinking water.

ii) Give an example for oil dispersed in water emulsion.

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11. a) i) write the equations for the steps in $SN1$ mechanism of the conversion of tertiary butyl bromide in to tertiary butyl alcohol.

ii) Haloarenes are less reactive towards nucleophilic substitution reactions than Haloalkanes. Give a reason.

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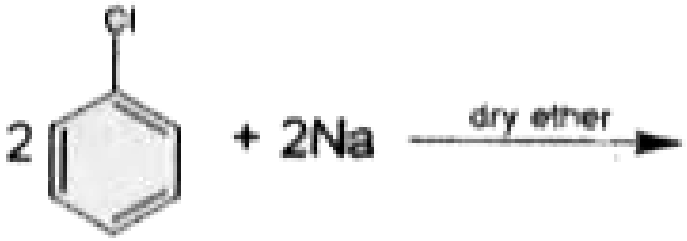
12. b) Complete the following equation:

i) $C_2H_5OH + SOCl_2 \rightarrow$



ii)

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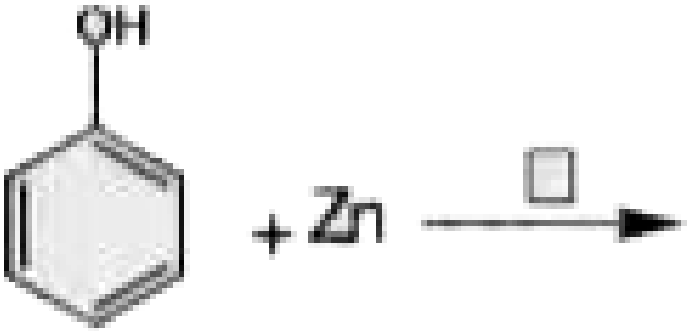
13. i) Explain the preparation of phenol from cumene.

ii) Complete the reaction :



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14. Explain Williamson's ether synthesis.

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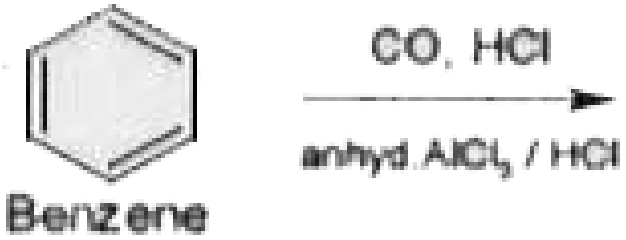
15. i) How do you convert benzoic acid to benzamide? Write the reaction.

ii) Complete the reaction:



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16. What happens when the carbonly compounds are treated with hydrazine? Write the reaction.

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17. i) Explain Hoffmann bromamide degradation for the preparation of aniline.

ii) Give the IUPAC name of $CH_3 - NH - CH_2 - CH_3$.

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18. b) What is Hinsberg's reagent? Between CH_3NH_2 and $C_6H_5NH_2$ which is more basic?

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19. i) Name the water insoluble component of starch.

ii) Mention one water soluble vitamin.

iii) Is Lysine an essential or non-essential amino acid?

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20. Write the structure of Maltose.

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21. i) Explain the preparation of Buna-N.

ii) Give an example for thermosetting polymer.

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22. Name the monomers used in the preparation of polythene and natural rubber.

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