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XII HSC - BOARD - FEB - 2016

Date: 29.02.2016

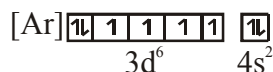
CHEMISTRY (55) - SOLUTIONS

SECTION - I

Q. 1

- (i) The substance which posses unpaired electrons and high paramagnetic character and when placed in a magnetic field, get strongly attracted and show permanent magnetic moment even when the external magnetic field is removed are said to be ferromagnetic. They can be permanently magntized. [1 Mark]

Iron with electronic configuration [Ar]3d⁶ 4s² i.e.



There are four unpaired electron. Hence, Fe is strongly ferromagnetic

[1 Mark]

Topic: Solid state ; Sub-topic: Magnetic properties _ L-1 Target-2016 XII-HSC Baord (55) Exam_Chemistry

- (ii) The temperature at which vapour pressure of liquid becomes equal to one atmospheric pressure is called boiling point of that liquid. [1 Mark]

$$\Delta T_f \propto m$$

$$\Delta T_f = k_f \cdot \frac{W_2}{M_2} \times \frac{1000}{W_1}$$

Where K_f – Cryoscopic constant

W₂ – mass of solute

W₁ – mass of solvent

M₂ – molecular mass of non-volatile solute

[1 Mark]

Topic: Solutions and colligative properties ; Sub-topic: Depression of freezing point _ L-1 Target-2016 XII-HSC Baord (55) Exam_Chemistry

- (iii) The mathematical expression for the first law of thermodynamics is,

$$\Delta U = q + w$$

When ΔU = change in energy

q = heat absorbed by the system

W = Amount of work done.

Adiabatic process: A process in which heat is not allowed to enter or leave the system at any stage the process is called adiabatic process.

$$\therefore q = 0$$

The mathematical expression for first law of thermodynamics is,

$$\Delta U = q + w$$

$$\therefore \Delta U = +w$$

[1 Mark]

Isochoric process : A process in which volume of the system remains constant throughout is called isochoric process. $\Delta V = 0$

The mathematical expression for first law of thermodynamics is,

$$\Delta U = q + W \text{ (where } W = -p\Delta V)$$

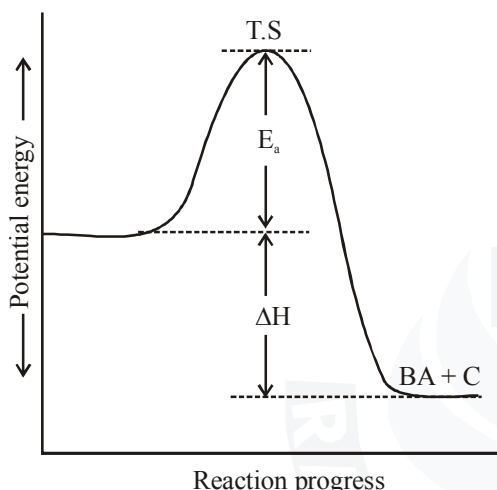
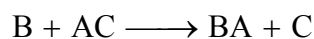
$$\Delta U = q + 0$$

$$q_v = \Delta U$$

[1 Mark]

Topic:Chemical thermodynamics and energetic; Sub-topic:First law of thermodynamics _ L-1_Target-2016_XII-HSC Baord (55) Exam_Chemistry

(iv) Consider a reaction



[1 Mark]

The rate of collision is given by

$$\text{Collision rate} = z[AC][B]$$

where z is the collision frequency and $[AC]$ and $[B]$ are the concentration of reactants.

$$\text{Reaction rate} = p.f \times \text{collision rate}$$

$$= p.f.z [AC][B] \quad \dots(1)$$

f is the formation of collision with sufficient kinetic energy (E_a)

P is the fraction of collision with proper orientation of collision

$$\text{Rate of Reaction} = K[AC][B] \quad \dots(2)$$

from (1) and (2)

$$K = p.f.z$$

$$\text{Since, } f = e^{-E_a/RT}$$

$$\text{We write } K = Pz e^{-E_a/RT}$$

But $A = Pz$ (frequency factor)

$$K = Ae^{-E_a/RT}$$

[1 Mark]

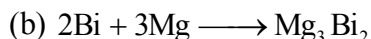
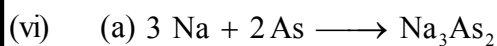
Topic:Chemical kinetics ; Sub-topic:Activation energy_ L-1_Target-2016_XII-HSC Baord (55) Exam_Chemistry

(v) Haematite : Fe_2O_3

Zinc blende : ZnS

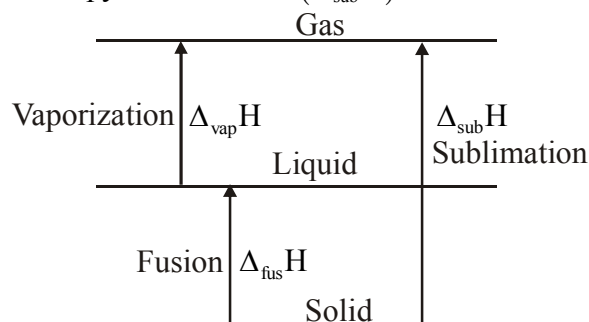
[1 Mark each]

Topic:General principles and processes of isolation of elements ; Sub-topic:Minerals of metal _ L-1_Target-2016_XII-HSC Baord (55) Exam_Chemistry



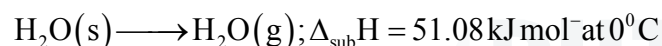
[1 Mark each]

Topic:p-block element ; Sub-topic:Group-15_ L-1 _Target-2016_ XII-HSC Baord (55) Exam_ Chemistry

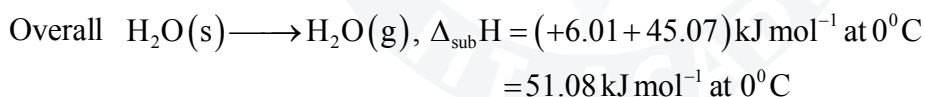
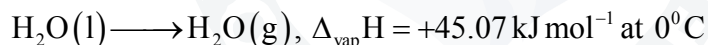
 (vii) Enthalpy of sublimation ($\Delta_{\text{sub}}\text{H}$)


[1 Mark]

The direct conversion of solid to vapour without going through liquid state is called sublimation. The enthalpy change that accompanies the conversion of one mole of solid directly into its vapour at constant temperature and pressure is called its enthalpy of sublimation. It is denoted by $\Delta_{\text{sub}}\text{H}$. For example



The enthalpy of sublimation of ice at 0°C and 1 atm pressure is $51.08 \text{ kJ mol}^{-1}$. It should be noted that whether the conversion of solid to vapour takes place directly in one step or in two steps, first melting of solid into liquid and then its vaporization, the enthalpy change is the same because enthalpy is a state function. For example,



It, therefore, follows that

$$\Delta_{\text{sub}}\text{H} = \Delta_{\text{fus}}\text{H} + \Delta_{\text{vap}}\text{H}$$

the relationship between $\Delta_{\text{sub}}\text{H}$, $\Delta_{\text{vap}}\text{H}$ and $\Delta_{\text{fus}}\text{H}$

[1 Mark]

Topic:Chemical thermodynamic; Sub-topic:Enthalpy of reaction_ L-1 _Target-2016_ XII-HSC Baord (55) Exam_ Chemistry

(viii) **Ellingham diagram** : The Ellingham diagram is the plot of free energy change ΔG against temperature for the reaction of metal and other elements with one mole of oxygen at 1 atmosphere. [1 Mark]

Features :

(i) The graph for the formation of a metal oxide is straight line with an upward slope.

(ii) There is sudden change in the slopes for some metal oxides, like MgO , ZnO and HgO [1 Mark]

Topic:General principles and processes of isolation of elements ; Sub-topic:Ellingham diagram_ L-1 _Target-2016_ XII-HSC Baord (55) Exam_ Chemistry

Q. 2

(i) Density of Ag = 10.51 g/cm^3 [1/2 Mark]

Vol. of unit cell = ?

Mass of one atom of silver

$$= \frac{\text{molar mass of silver}}{N_A}$$

$$= \frac{108}{6.022 \times 10^{23}}$$

$$= 17.93 \times 10^{-23} \text{ g}$$

Mass of unit cell of silver

$$= 71.72 \times 10^{-23} \text{ g}$$

$$= 4 \times 17.93 \times 10^{-23}$$

[1 Mark]

$$\therefore \text{Density of Ag} = \frac{\text{mass of unit cell}}{\text{vol. of unit cell}}$$

$$\therefore \text{Vol. of unit cell} = \frac{\text{mass of unit cell}}{\text{density of Ag}}$$

$$= \frac{71.72 \times 10^{-23}}{10.51}$$

[1 Mark]

$$\text{vol. of unit cell} = 68.27 \times 10^{-24} \text{ cm}^3$$

[1/2 Mark]

Topic: Solid state ; Sub-topic: Density of unit cell L-1_ _Target-2016_XII-HSC Baord (55) Exam_Chemistry

(ii) Molar Mass of benzene $C_6H_6 = (6 \times 12 + 6 \times 1) \times 10^{-3} \text{ kg mol}^{-1}$

$$p_1^0 = 640 \text{ mm Hg. } p = 600 \text{ mm Hg}$$

$$W_1 = 39 \times 10^{-3} \text{ kg}$$

$$W_2 = 2.175 \times 10^{-3} \text{ kg}$$

$$M_1 = 78 \times 10^{-3} \text{ kg mol}^{-1}$$

[1/2 Mark]

$$M_2 = ?$$

$$\frac{p_1^0 - p}{p_1^0} = \frac{W_2}{M_2} \frac{M_1}{W_1}$$

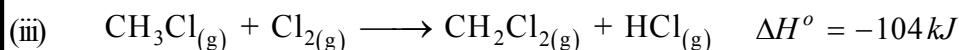
$$\frac{640 \text{ mm} - 600 \text{ mm}}{640 \text{ mm}} = \frac{2.175 \times 10^{-3} \text{ kg} \times 78.0 \times 10^{-3} \text{ kg mol}^{-1}}{39.0 \times 10^{-3} \text{ kg} \times M_2}$$

$$M_2 = \frac{2.175 \times 10^{-3} \text{ kg} \times 78.0 \times 10^{-3} \text{ kg mol}^{-1} \times 640 \text{ mm}}{39.0 \text{ kg} \times 10^{-3} \times 40 \text{ mm}}$$

$$= 69.6 \times 10^{-3} \text{ kg mol}^{-1} \quad [2 \text{ Marks}]$$

$$\text{Molecular Mass} = 69.6 \text{ g mol}^{-1} \quad [1/2 \text{ Mark}]$$

Topic: Solution and colligative Properties ; Sub-topic: Relative Lowering of vapour pressure_ L-1 _Target-2016_XII-HSC Baord (55) Exam_Chemistry



$$\Delta H^\circ = \sum \Delta H^\circ_{(\text{reactant bond})} - \sum \Delta H^\circ_{(\text{product bond})} \quad [1 \text{ Mark}]$$

$$\Delta H^\circ = [3\Delta H^\circ_{C-H} + \Delta H_{C-Cl} + \Delta H_{Cl-Cl}] - [2\Delta H_{C-H} + 2\Delta H_{C-Cl} + \Delta H_{H-Cl}]$$

$$-104 = [1242 + 243 + \Delta H_{C-Cl}] - [828 + 2\Delta H_{C-Cl} + 431]$$

$$-104 = [1485 + \Delta H_{C-Cl}] - [1259 + 2\Delta H_{C-Cl}]$$

$$-104 = 226 - \Delta H_{C-Cl}$$

$$\Delta H_{C-Cl} = 226 + 104$$

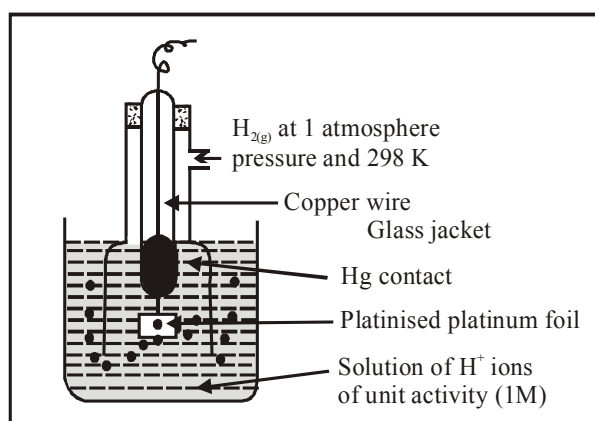
$$= 330 \text{ kJ/mol} \quad [2 \text{ Marks}]$$

Topic: Chemical Thermodynamics ; Sub-topic: Bond Enthalpy L- 1 __Target-2016_XII-HSC Baord (55) Exam_Chemistry

(iv) Cell constant is defined of the ratio of the distance between electrode and cross sectional area of electrode.

$$b = \frac{l}{a}$$

[1 Mark]



Standard hydrogen electrode

[2 Marks]

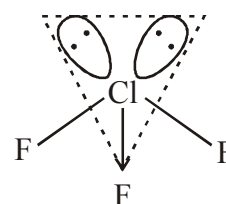
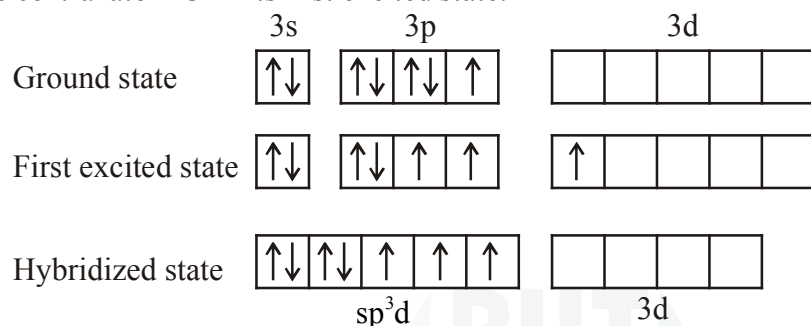
Topic: Electro chemistry ; Sub-topic: Reference Electrode_ L-01 _Target-2016_XII-HSC Baord (55) Exam_Chemistry

Q. 3

- (A) (i) At ordinary temperature, nitrogen is gas while other elements of the group are solids.
 (ii) Nitrogen exist as diatomic molecule (N_2), while phosphorus and the other elements exist as tetra atomic molecule (As_4, Sb_4, P_4 etc.)
 (iii) Nitrogen does not form penta halides, while all other elements of the group form penta halides.
 (iv) Nitrogen shows wide range of oxidation states viz from -3 to $+5$. The other elements of the group show only a limited number of oxidation states.

[1/2 Mark each]

Interhalogen ClF_3 possess T-shaped or trigonal bipyramidal structure. It is formed by sp^3d hybridization of the central atom Cl in its first excited state.

[1 Mark]

[1 Mark]

According to the formula

$$k = \frac{1}{R} \cdot \frac{\ell}{a} \left\{ \begin{array}{l} k \rightarrow \text{Conductivity} \\ R \rightarrow \text{Resistance} \\ \ell \rightarrow \text{Length of electrode} \\ a \rightarrow \text{Area of cross section} \end{array} \right.$$

According to question

$$k = 6.23 \times 10^{-5} \text{ ohm}^{-1} \text{ cm}^{-1}$$

$$R = 13710 \text{ ohm}$$

$$\ell = 0.7 \text{ cm}$$

$$a = ?$$

$$\therefore a = \frac{\ell}{R \times k} = \frac{0.7 \text{ cm}}{13710 \text{ ohm} \times 6.23 \times 10^{-5} \text{ ohm}^{-1} \text{ cm}^{-1}} = 0.823 \text{ cm}^2$$

Area : Cross-sectional area of electrode is 0.823 cm^2

[2 Marks]

$$\text{Molality} = \frac{\text{Number of moles of solute}}{\text{Mass of solvent in Kg}}$$

As both number of mole and mass of solvent are independent of temperature, so molality is also independent of temperature.

[1 Mark]

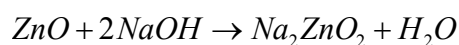
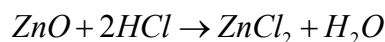
Topic: p-block element, Electrochemistry, Solutions and colligative peoperties ; **Sub-topic:** Group-15 , Conductivity, Concentration of solution _ L-2_ Target-2016 _ XII-HSC Baord (55) Exam _ Chemistry

(B) There are oxides which are neither acidic nor basic such oxides are known as neutral oxides.

For example : NO, N_2O & CO

[1 Mark]

ZnO is amphoteric oxide as it reacts with acids as well as bases to form salts.



[1 Mark]

Molar conductivity is defined as the conductance of a volume of solutions containing 1 mole of dissolved electrolyte when placed between two parallel electrodes 1cm apart and large enough to contain between them all the solution.

If sum of the exponents to which the concentration terms in the rate law are raised is zero then it is called zero order reaction.

[1 Mark each]

$A \rightarrow$ product

$$-\frac{d[A]}{dt} = K[A]^0$$

According to the integrated rate law of first order reaction

$$K = \frac{1}{t} \times 2.303 \log \frac{[A_0]}{[A]_t}$$

[1 Mark]

According to question

$$t = 45 \text{ min} = 45 \times 60 \text{ sec} = 2700 \text{ sec}$$

$$[A_0] = 100$$

$$[A]_t = 40$$

$$\therefore K = \frac{1}{2700} \times 2.303 \log \left(\frac{100}{40} \right) \text{sec}^{-1}$$

$$= 0.053 \text{sec}^{-1}$$

[2 Marks]

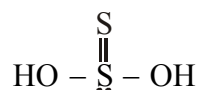
Topic: p-block elements, Electrochemistry, Chemical kinetics; **Sub-topic:** Group 16 elements, Molar conductivity, First order and zero order reaction_ L-2_Target-2016_XII-HSC Baord (55) Exam_Chemistry

Q. 4

(i) (b)

Thiosulphurous acid

[1 mark]



Topic: p-block; **Sub-topic:** oxo-acid of sulphur_ L-1_Target-2016_XII-HSC Baord (55) Exam_Chemistry

(ii) (c)

nonpolar molecular solid

[1 mark]



Topic: Solid state ; **Sub-topic:** Molecular solid_ L-1_Target-2016_XII-HSC Baord (55) Exam_Chemistry

(iii) (a)

Measuring heat capacity of substance at various temperatures.

The value of S_T can be determined by measuring heat capacity of the solid at various temperatures and using the expression.

$$\Delta S = S_T - S_0 = S_T = \int_0^T \frac{C_p \cdot dT}{T} \quad [1 \text{ mark}]$$

Topic: Chemical Thermodynamic ; Sub-topic: Entropy _ L-1 _ Target-2016 _ XII-HSC Baord (55) Exam_Chemistry

(iv) (c)

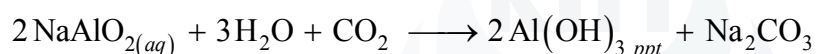
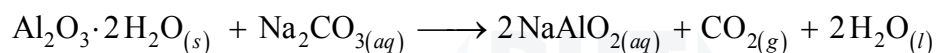
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[1 mark]

Topic: Solution of colligative property; Sub-topic: Colligative property _ L-1 _ Target-2016 _ XII-HSC Baord (55) Exam_Chemistry

(v) (d)

Hall's process



Topic: General principles and processes of isolation of elements; Sub-topic: Leaching process _ L-1 _ Target-2016 _ XII-HSC Baord (55) Exam_Chemistry

(vi) (b)

2

$$I = \frac{q}{t}$$

$$= \frac{840}{7 \times 60} = 2$$

[1 mark]

Topic: Electrochemistry ; Sub-topic: Electorlytic cell _ L-1 _ Target-2016 _ XII-HSC Baord (55) Exam_Chemistry

(vii) (b)

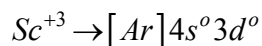
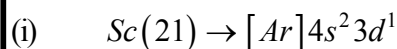
$$1.1 \times 10^{-4} \text{ s}^{-1}$$

$$R = K [A]^1$$

$$K = \frac{R}{[A]} = \frac{6.6 \times 10^{-5}}{0.6}$$

$$= 1.1 \text{ } 5 \text{ } 10^{-4} \text{ s}^{-1} \quad [1 \text{ mark}]$$

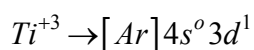
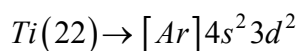
Topic: Chemical kinetic ; Sub-topic: Rate Law _ L-1 _ Target-2016 _ XII-HSC Baord (55) Exam_Chemistry

SECTION - II**Q. 5**

No unpaired electrons present

[1 mark]

It is colourless

 Ti^{+3} ion has unpaired e^- present in empty d-orbital available for d-d- transition \therefore It's coloured.**[1 mark]****Topic: d and f block elements ; Sub-topic: Colour complex_ L-1_Target-2016_XII-HSC Baord (55) Exam_Chemistry**

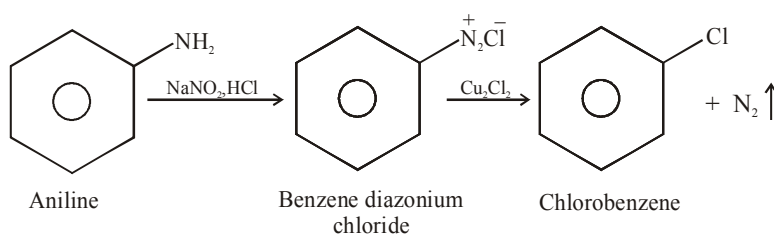
(ii)

Each point carries 1/2 marks

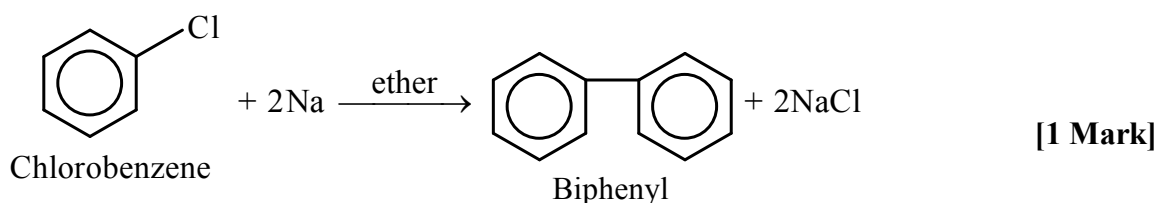
Double salt	Complex compound
1. They contain two simple salt in equimolar proportion.	1. They contain a complex of salt which may or may not be in equimolar proportion
2. In aqueous solution, they dissociate completely into ions	2. In aqueous solution complex ion does not dissociation into ions.
3. They are ionic compound and contain ionic bonds	3. They may or may not be ionic complex part always contains coordinate bonds.
4. Properties of the salt is same as its constituent compounds.	4. The properties of the compound are different from its constituents due to complex formation.
Example: Potash alum $K_2SO_4 \cdot Al_2SO_3 \cdot 24H_2O$	Example: Potassium hexachloroplatinate (IV) $K_2[PtCl_6]$

Topic: Coordination compounds; Sub-topic: Coordination compounds_ L-1_Target-2016_XII-HSC Baord (55) Exam_Chemistry

(iii)

**[1 Mark]**

Primary amines react with nitrous acid to give diazonium cation. Which is then treated with cuprous chloride gives Chlorobenzene.



Aryl halides also give analogous compounds when treated with sodium in dry ether, in which two aryl groups are joined together. It is called Fittig reaction.

Topic: Halogen derivatives of alkanes and arenes ; Sub-topic: Haloarene _ L-1 _ Target-2016 _ XII-HSC Board (55) Exam _ Chemistry

- (iv) The property in which ethers have same molecular formula but different alkyl groups in their structures is called metamerism and the isomers obtained are called as metamers. [1 Mark]

Examples:

e.g. $C_2H_5 - O - C_2H_5$ Diethyl ether; $CH_3 - O - C_3H_7$ Methyl n-propyl ether

In the above example both ethers are having same molecular formula i.e. C_4H_{10} but different alkyl groups in their structure, so they are metamers of each other. [1 Mark]

Topic: Alcohol, Phenol and Ether; Sub-topic: Isomerism of ether _ L-1 _ Target-2016 _ XII-HSC Board (55) Exam _ Chemistry

- (v) **Ketones** : Ketones are those carbonyl compounds in which two alkyl or aryl group are attached to carbonyl

group. They are represented as $R - \overset{\text{O}}{\parallel} C - R'$

Definition: Ketones may be defined as the first oxidation product of secondary alcohol.



Ketones are classified into two groups:

Simple Ketones : Ketones in which two same alkyl groups or aryl groups are attached to carbonyl group are called Simple Ketones.

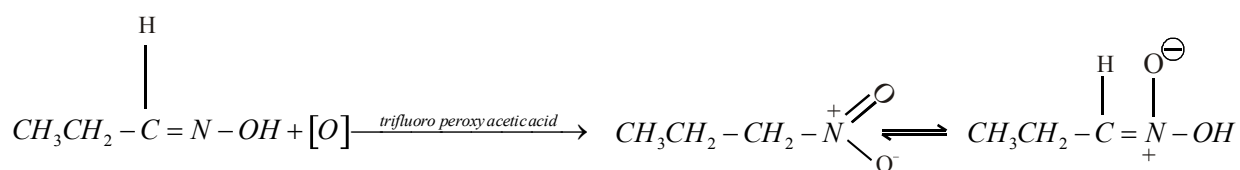
eg. $CH_3 - \overset{\text{O}}{\parallel} C - CH_3$, $CH_3 - CH_2 - \overset{\text{O}}{\parallel} C - CH_2 - CH_3$

Mixed Ketones : Ketones in which two different alkyl groups are attached to carbonyl group are called mixed ketones.

eg. $H_3C - \overset{\text{O}}{\parallel} C - CH_2CH_3$ [1 Mark]

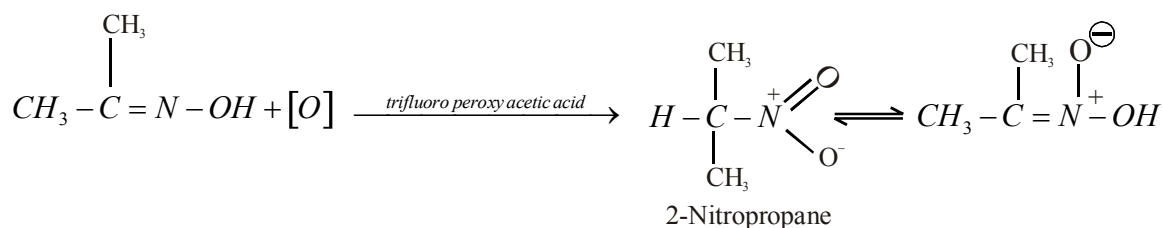
Topic: Aldehyde, ketones and carboxylic acids ; Sub-topic: Classification of keton _ L-1 _ Target-2016 _ XII-HSC Board (55) Exam _ Chemistry

- (vi) Aldoximes and ketoximes on oxidation in presence of trifluoroperoxy acetic acid gives primary & secondary nitro alkanes respectively.



[1 Mark]

1 - Nitropropane



[1 Mark]

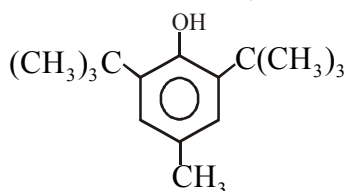
Topic: Aldehyde, ketones and carboxylic acids ; Sub-topic: Chemical reactions _ L-1_ Target-2016_ XII-HSC Baord (55) Exam_ Chemistry

- (vii) The chemical substances which retards the action of oxygen on food and help in the preservation of food are called antioxidants.

Examples : the most common antioxidant used are, Butylated hydroxy toluene (BHT) and butylated hydroxylanisole (BHA)

[1 Mark]

Butylated hydroxy toluene (BHT):
Molecular formula : $\text{C}_{15}\text{H}_{24}\text{O}$



[1 Mark]

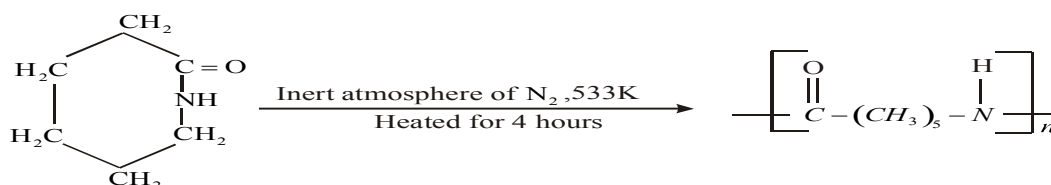
Topic: Chemistry in everyday life; Sub-topic: Antioxidants _ L-1_ Target-2016_ XII-HSC Baord (55) Exam_ Chemistry

- (viii) Carbohydrates are polyhydroxy aldehydes or polyhydroxy ketones or those compounds that can be hydrolysed to polyhydroxy aldehydes or polyhydroxy ketones.

e.g. glucose, sucrose, starch.

[1 Mark]

Nylon - 6 is prepared from a monomer, ϵ - caprolactum (monomer). The monomer is obtained from ω - amino caproic acid.



[1 Mark]

ϵ – caprolactum, (monomer)

Nylon-6 → It is a linear polyamide, it is also called parlon - L polycapropactum

Topic: Biomolecules and Polymers ; Sub-topic: Carbohydrate, Preparation of polymer _ L-1 _ Target-2016 _ XII-HSC Baord (55) Exam _ Chemistry

Q. 6

(i) The element in which differentiating electron enter into f-orbital are called f-block element. [1 Mark]

Lanthanoids

- (1) Differentiating electron enters in 4f orbitals
- (2) Belong to sixth period and form a part of the third transition series. They constitute first inner transition series
- (3) Lanthanoids show less tendency to form complexes
- (4) Contraction is relatively less

Actinoids

- Differentiating electron enters in 5f orbitals
- Belong to seventh period and form a part of the fourth transition series. They constitute second inner transition series
- Actinoids show greater tendency to form Complexes.
- Contraction is greater in this series due to poor shielding of 5 f electrons

[each point carries 1 mark]

Topic: d and f-block elements; Sub-topic: Lanthanoids and Actinoids _ L-1 _ Target-2016 _ XII-HSC Baord (55) Exam _ Chemistry

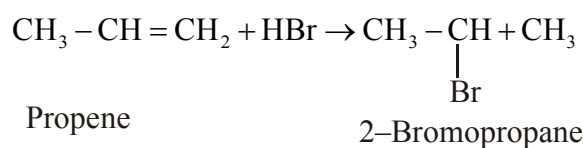
(ii) **Definitions :**

- (a) **Optical activity** – The property of certain organic compounds which rotate the plane of plane polarised light towards right (clock wise) or towards left (anticlockwise) is called optical activity. [1 Mark]
- (b) **Ligand** – The molecules or ions which are coordinated to the metal atom or ion in a coordination compound are called ligands [1 Mark]
- (c) **Interstitial compounds** – The compounds which are formed, when small atoms like H, C or N are trapped inside the interstitial spaces in crystal lattice of transition metals are called interstitial compounds.

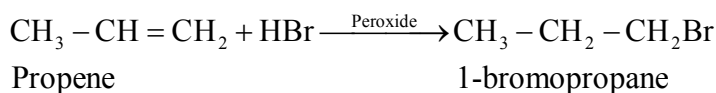
[1 Mark]

Topic: Halogen derivatives of alkane and arene, Coordination compound, Solid state ; Sub-topic: Optical activity, Ligand, Defect _ L-1 _ Target-2016 _ XII-HSC Baord (55) Exam _ Chemistry

(iii) Formula – $[\text{Pt}(\text{NH}_3)_4 \text{Cl}_2] \text{Cl}_2$ [1 Mark]



Propene on addition of Hydrogen Bromide gives isopropyl bromide as major product according to Markownikoff's rule. [1 Mark]



Propene on addition of Hydrogen bromide in presence of peroxide gives 1-bromopropane as major product according to Anti-Markownikoff's rule. [1 Mark]

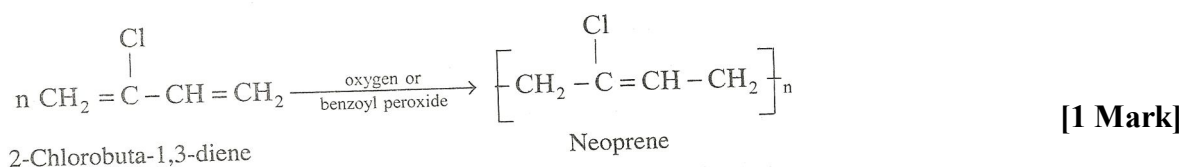
Topic: Coordination compounds, Halogen derivatives of alkane and arene ; Sub-topic: Nomenclature, Methods of Preparation _ L-1 _ Target-2016 _ XII-HSC Baord (55) Exam _ Chemistry

- (iv) The antibiotic which is effective against a wide range of gram positive and gram negative bacteria known as broad spectrum antibiotic [1 Mark]

Preparing polyethene : The monomer used is ethene. It is an addition polymer. It is of two types.



Preparing of Neoprne : The monomer used is chloroprene (2-chlorobuta-1,3-diene). It is superior to natural rubber and resistant to chemical action. It is used in the manufacture of chemical containers, conveyor belts, gaskets etc.



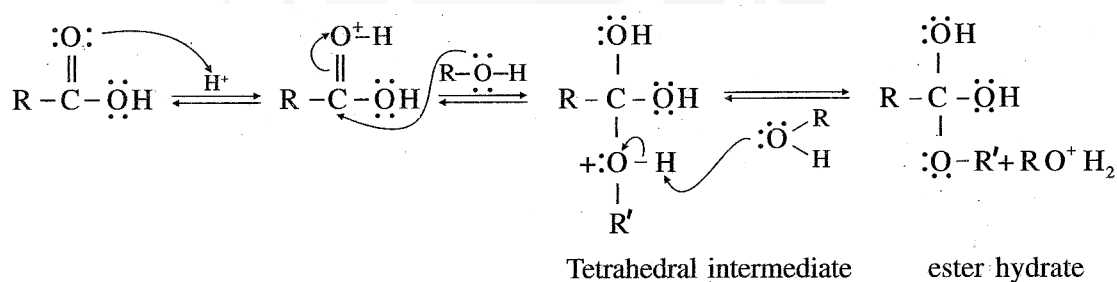
Topic: Chemistry in everyday life, polymer; Sub-topic: Antimicrobial compound, Methods of preparation
L-1 Target-2016 XII-HSC Board (55) Exam Chemistry

Q. 7

(A) **Esterification Mechanism :**

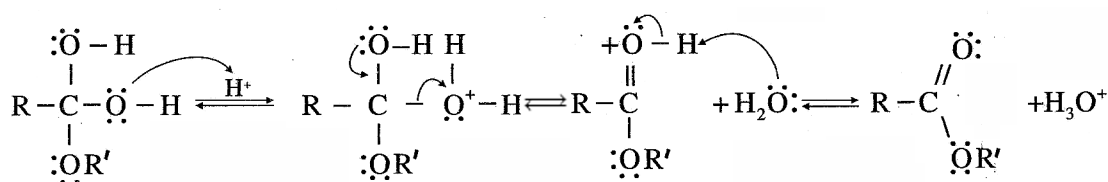
The mechanism can be written in two steps :

- (i) Acid catalyzed addition of alcohol to carbonyl group of carboxylic acid.



[2 Marks]

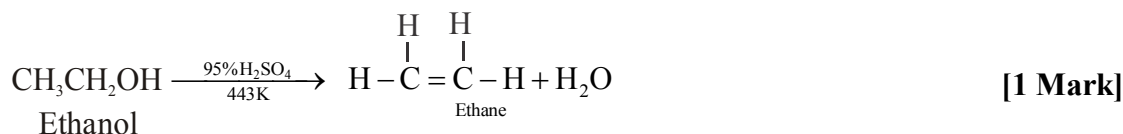
- (ii) Acid catalyzed dehydration.



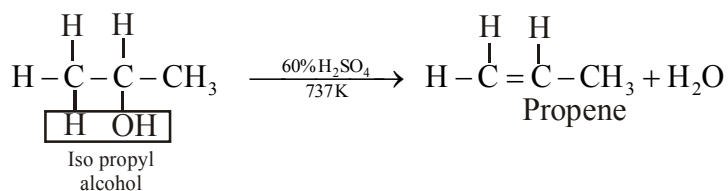
[2 Marks]

Dehydration of 1°, 2° and 3° alcohol

- (i) **Dehydration of Primary Alcohols:** Primary alcohols like ethyl alcohol on heating with 95% H_2SO_4 at about 443 K undergoes dehydration forming an alkene like ethene or ethylene.

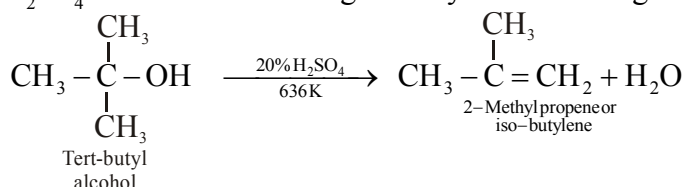


- (ii) **Dehydration of Secondary Alcohols:** Secondary alcohols like Isopropyl alcohol on heating with 60% H_2SO_4 at about 373 K undergoes dehydration forming an alkene like propene or propylene.



[1 Mark]

- (iii) **Dehydration of Tertiary alcohols:** Tertiary alcohol like tert, butyl alcohol on heating with 20% H_2SO_4 at about 363 K undergoes dehydration forming an alkene like 2-methyl propene or isobutylene.



[1 Mark]

Topic: Aldehyde, Ketone and Carboxylic acids, Alcohols, Phenols and ethers; Sub-topic: Mechanism of nucleophilic addition, Mechanism of dehydration_ L-1 Target-2016_ XII-HSC Baord (55) Exam_Chemistry

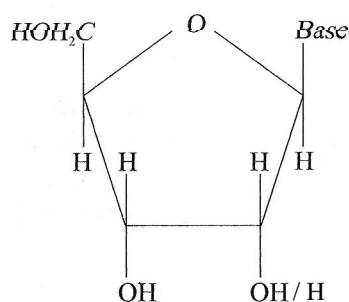
- (B) Vitamins are organic substances that must be supplied to permit proportionate growth in living beings or for maintenance of structure.

[1 Mark]

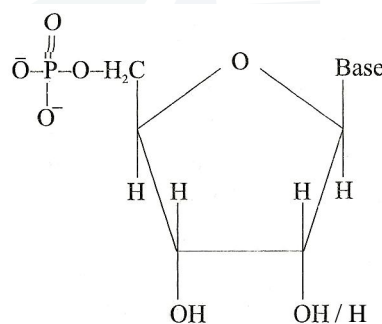
Deficiency of vitamin A causes Night blindness, dryness in skin and hairs and retardation of growth.

Structure of Nucleoside and Nucleotide :

[1 Mark]



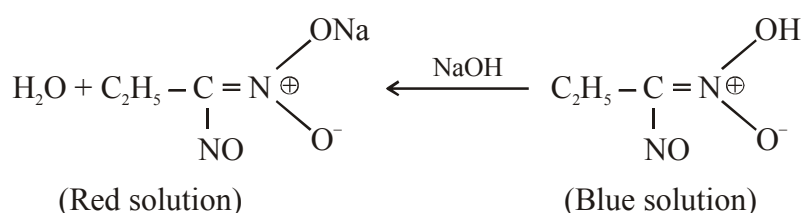
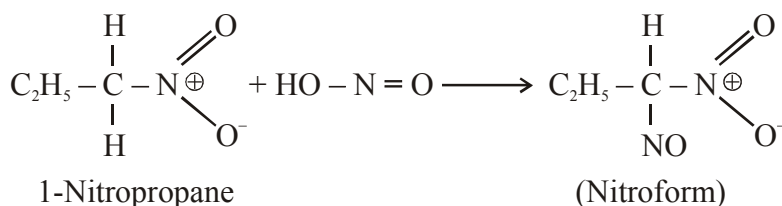
Nucleoside



Nucleotide

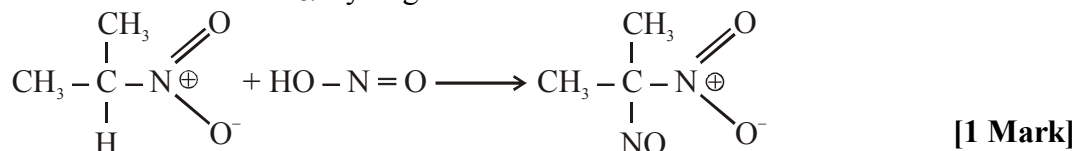
[2 Marks]

Primary Nitroalkane like 1-Nitropropane react with nitrous acid to form blue coloured nitroso- nitroalkanes which dissolve in NaOH to give red solutions.



[1 Mark]

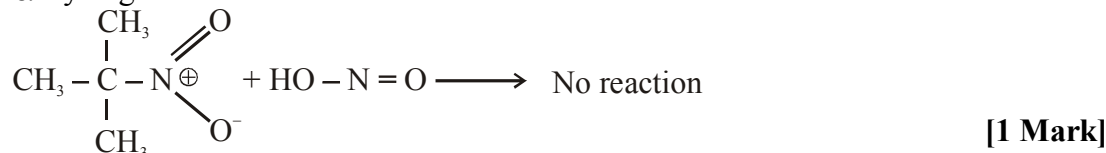
Secondary Nitroalkane like 2-Nitropropane reacts with nitrous acid to form blue coloured nitroso-Nitroalkane which no more contain α -hydrogen atom hence are insoluble in NaOH.



2-Nitropropane

(Blue solution)

Tertiary Nitroalkane like 2-methyl 2-nitropropane do not react with nitrous acid since they have no α -hydrogen atom.



2-Methyl-2-nitropropane

Topic:Compounds containing nitrogenNitrogen ; Sub-topic:Identification of primary, secondary and tertiary amines_ L-1 _Target-2016_XII-HSC Baord (55) Exam_Chemistry

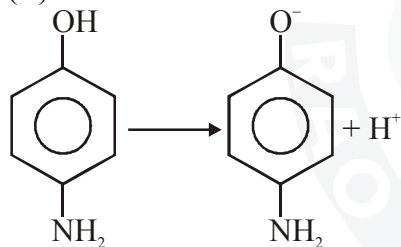
Q. 8

(i) (C)

Conversion of alkyl halide to alkyl fluoride using AgF is Swarts Reaction [1 Mark]

Topic:Halogen derivative of alkane; Sub-topic:Preparation_ _ L-1 _Target-2016_XII-HSC Baord (55) Exam_Chemistry

(ii) (D)

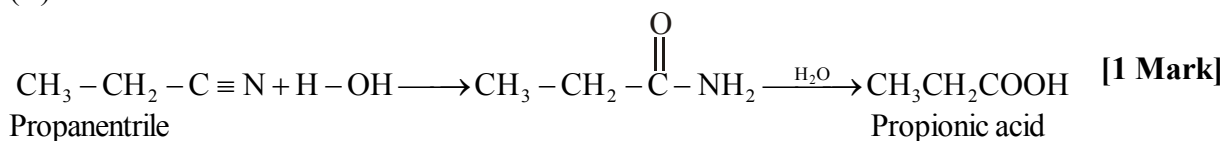


[1 Mark]

+ R effect of NH_2 group. Increase the -ve charge on oxygen atom which decreases the stability of conjugate base of p-aminophenol.

Topic:Alcohol, Phenol, Ether; Sub-topic:Properties _ L-1 _Target-2016_XII-HSC Baord (55) Exam_Chemistry

(iii) (D)



Topic:Aldehyde, Ketone and Carboxylic acids;; Sub-topic:Preparation of acid _ L-1 _Target-2016_XII-HSC Baord (55) Exam_Chemistry

(iv) (A)

Primary amine like ethylamine gives carbylamine test forming foul smelling product [1 Mark]

Topic:Compound containing nitrogen ; Sub-topic:Reaction of amine_ L-1 _Target-2016_XII-HSC Baord (55) Exam_Chemistry

(v) (D)

Uracil is present in RNA

[1 Mark]

Topic:Biomolecules ; Sub-topic:Nucleic acid _ L-1 _Target-2016_XII-HSC Baord (55) Exam_Chemistry

(vi) (C)

PHBV is a copolymer of 3-hydroxybutanoic acid and 3-hydroxypentanoic acid [1 Mark]

Topic:Polymer ; Sub-topic:Preparation_ L-1 _Target-2016_XII-HSC Baord (55) Exam_Chemistry

(vii) (D)

Phenylzine is an antidepresent

[1 Mark]

Topic:Chemistry in everyday life; Sub-topic:Drugs _ L-1 _Target-2016_XII-HSC Baord (55) Exam_Chemistry