IN-CHAPTER EXERCISE - C

Choose the correct alternative. Only One Choice is Correct. Question marked with '*' may have More than One Correct option.

1. $Ph - OCH_3 + HI \longrightarrow A + B$. *A and B are* :

(A) Ph – I, CH_3OH **(B)** Ph – OH, CH_3I **(C)** P_6H_6, CH_3I **(D)** Ph – I, CH_4

2. *Epoxides react with Grignard reagent to form*

(A) 1° alcohol **(B)** 2° alcohols **(C)** 3° alcohols **(D)** *Any of the three*

3. *Which of the following is the best procedure to make isopropylmethylether using the Williamson method ?*

(A) $CH_3OH + (CH_3)_2CHOH + H_2SO_4$ **(B)** $CH_3OH + (CH_3)_2CHCH_2OH + H_2SO_4$

(C) $CH_3ONa + (CH_3)_2CHBr$ **(D)** $CH_3I + (CH_3)_2CHONa$

4. *The final product obtained in the following reaction is* : $CH_3 - O - CH = CH_2 \xrightarrow[\text{Anhydrous}]{HBr}$

(A) CH_3OH and $CH_3 - CH_2Br$ **(B)** $CH_3 - O - \underset{\displaystyle Br}{\underset{|}{CH}} - CH_3$

(C) $CH_3Br + CH_3CHO$ **(D)** $CH_3OH + CH_2 = CH - Br$

5. *The C–O–C angle in ether is* :

(A) 180° **(B)** 109° 28' **(C)** 110° **(D)** 104°

6. *When diethyl ether is heated with an excess of PCl_5, it yields* :

(A) *ethyl choride* **(B)** *diethyl ether peroxide*

(C) *ethanoyl chloride* **(D)** *perchlorodiethyl ether*

7. *Diethyl ether on heating with hot conc. HI gives two moles of* :

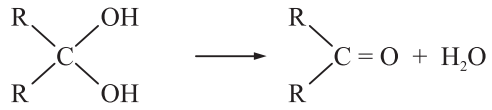
(A) *ethanol* **(B)** *iodoform* **(C)** *ethyl iodide* **(D)** *methyl iodide*

DIHYDRIC ALCOHOLS — Section - 4

Dihydric alcohols are called as diols. There are two types of diols :

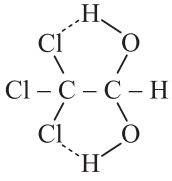
(i) Geminal diol **(ii)** Vicinal diol

Geminal diols are unstable because of steric reason. These are hydrates of carbonyl compounds.

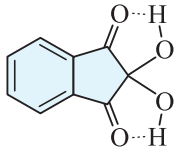


Geminal diol

Some geminal diols are stable due to intramolecular H-bonding.

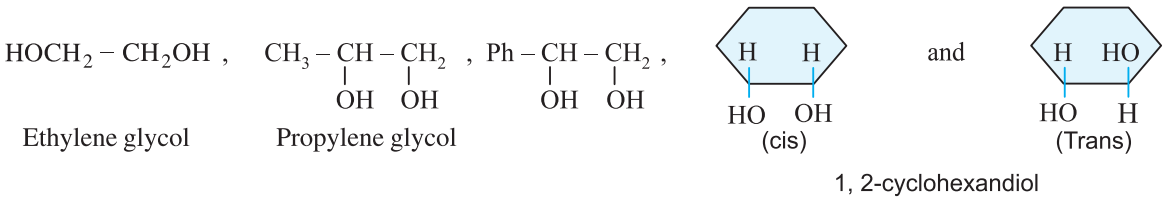


Chloral hydrate

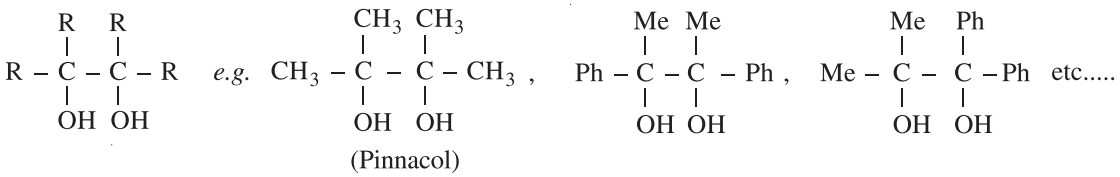


Ninhydrin

The viccinal type of dihydric alcohols are called as Glycols (Di-ols). Some Important Glycols are given below :

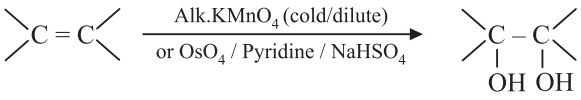


Pinnacol(s) : Completely substituted vicinal diol is called as pinacol.

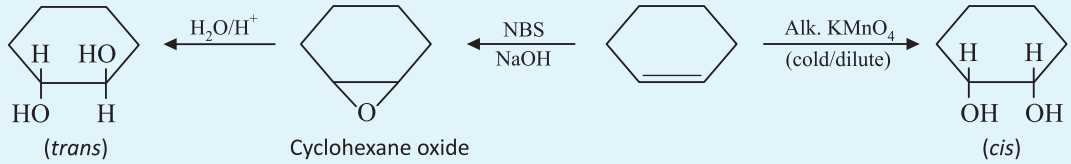


Preparations of Glycols

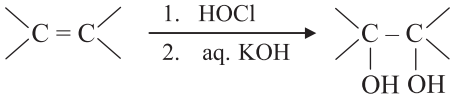
1. Hydroxylation of Alkenes

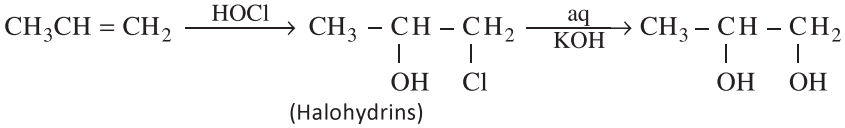


Note : ➤ The reaction involves '*syn*' addition.

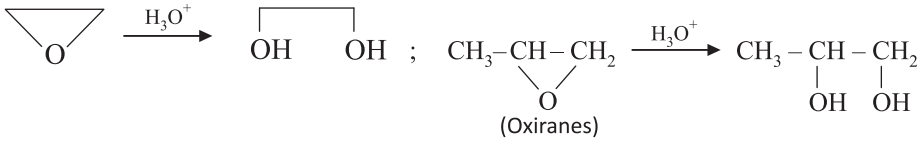


2. Hydrolysis of Halohydrins

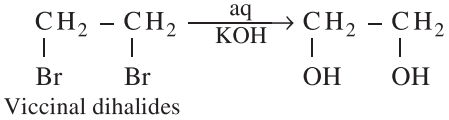




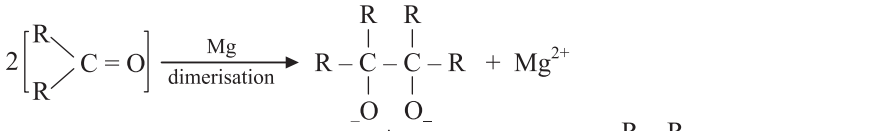
3. Acidic Hydrolysis of Oxiranes

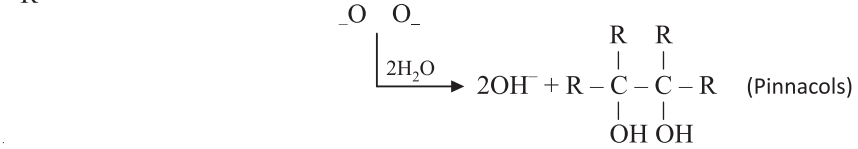


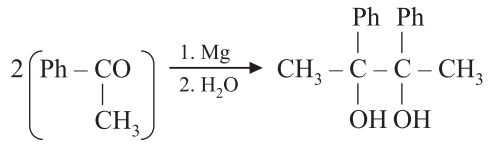
4. Hydrolysis of Viccinal Dihalides

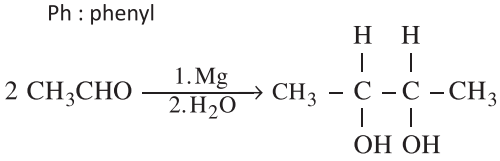


5. Reductive hydrolysis of carbonyl compounds (An important method for Pinnacols)

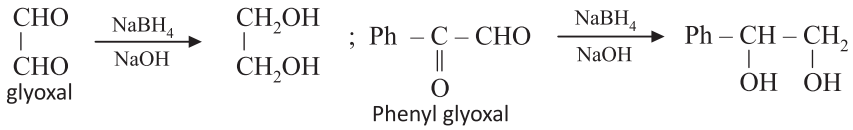





Ph : phenyl

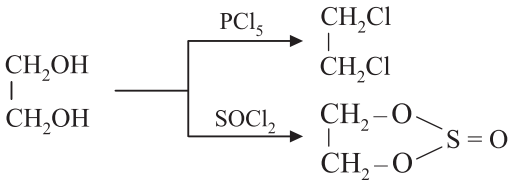


6. Reduction of Glyoxal(s)



Reactions of Glycol

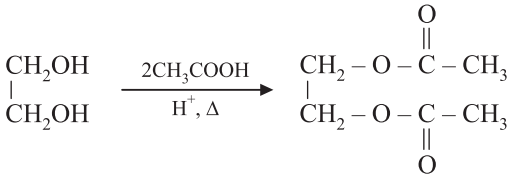
1.



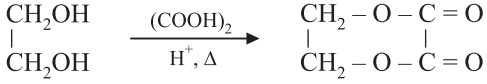
(viccinal dihalides)

(cyclic sulphite)

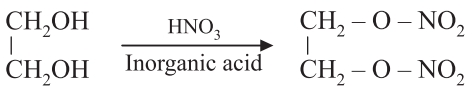
2. Reactions with Organic and Inorganic Acids



(esterification)

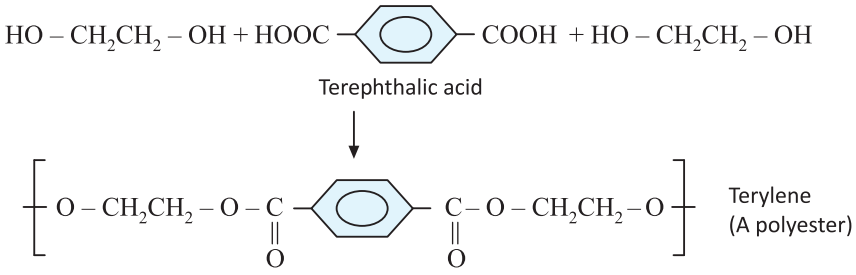


(esterification)

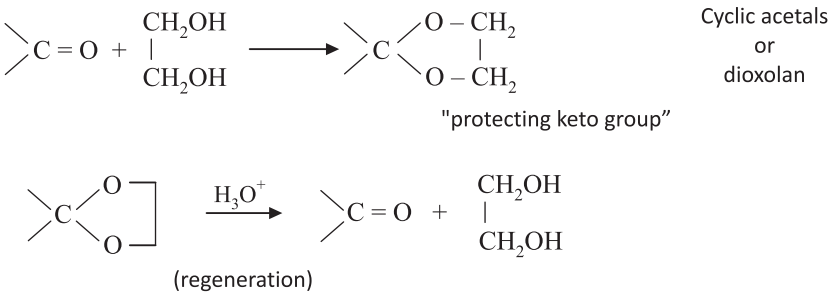


(Dinitrate)

3. Polymerisation

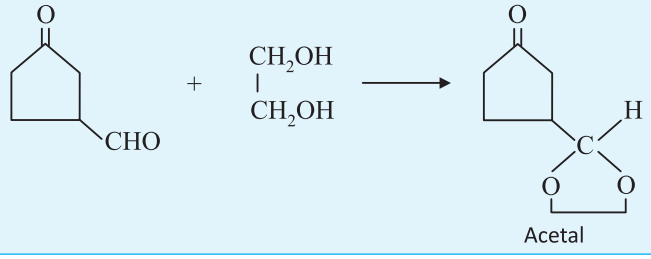


4. Acetal (ketal) formation (cyclic acetals : dioxolan)

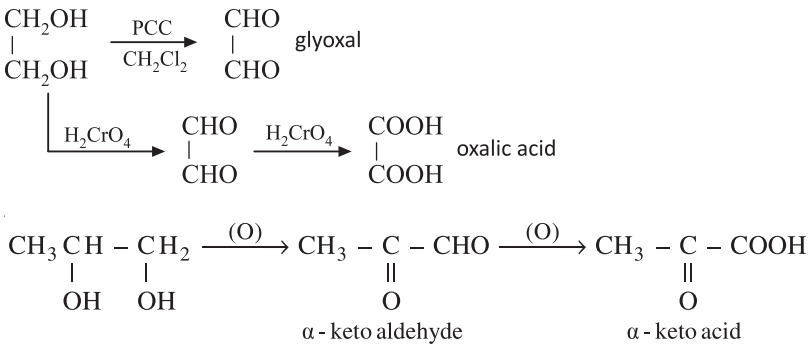


***Note* : (i)** Acetals are stable in alkaline medium and are not reduced. Hence keto groups are protected in acetal forms. Acetals are very easily hydrolysed in acidic medium to give back aldehyde and ketones.

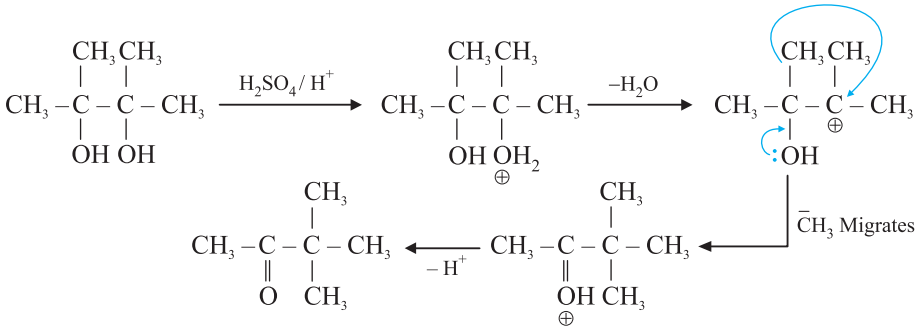
(ii) Aldehydes are more reactive than ketones in this reaction.



5. (a) Oxidation



Mechanism :

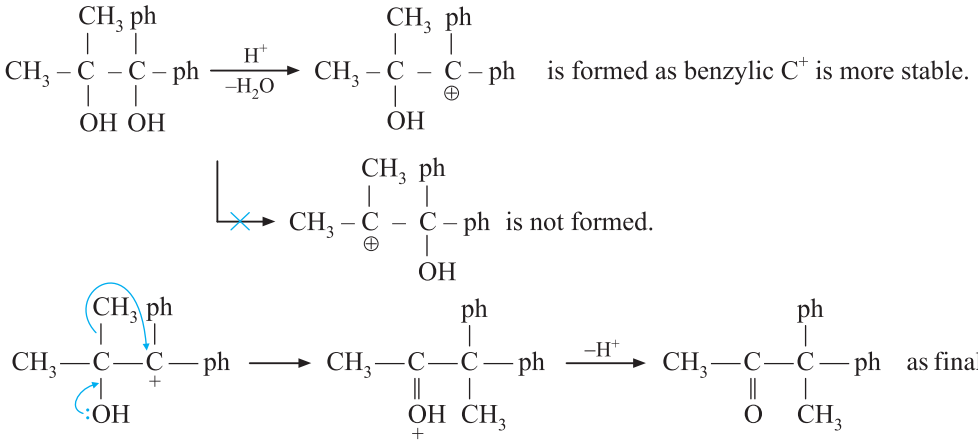


Note : The mechanism follows :

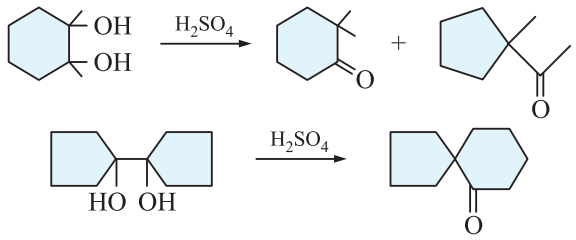
- Protonation of one hydroxyl group.
- Loss of proton.
- Migration of $H^-/ph^-/Me^-$
- Loss of proton to give ketone.

Important :

1. Watch for the stability of carbocation in case of other diols.
2. Follow the order of migration as : 'H' followed by 'phenyl', followed by Ethyl followed by Methyl

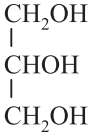
-  is formed as benzylic C^+ is more stable.

- Ring expansion or ring contraction may also takes place if possible and major and minor depends upon stereochemistry of diol.



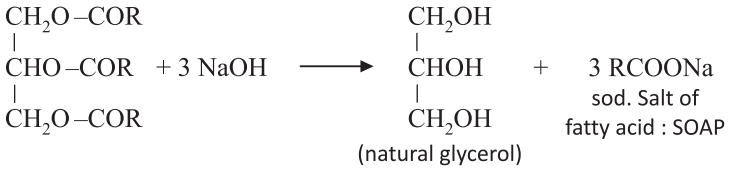
Tri-hydric Alcohol (Glycerol)

Glycerol (Glycerine)
Propan - 1, 2, 3 -triol

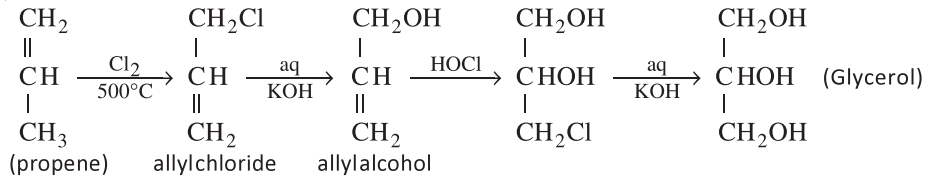


Preparations of Glycerol

1. Saponification of oils/fats (glycerides)

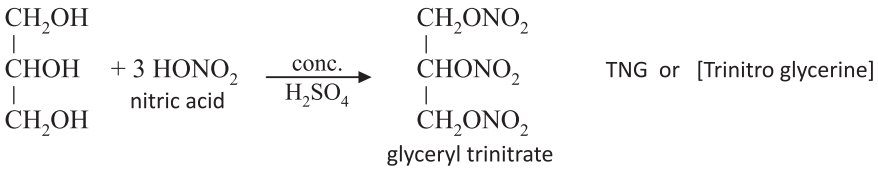


2. Synthetic glycerol

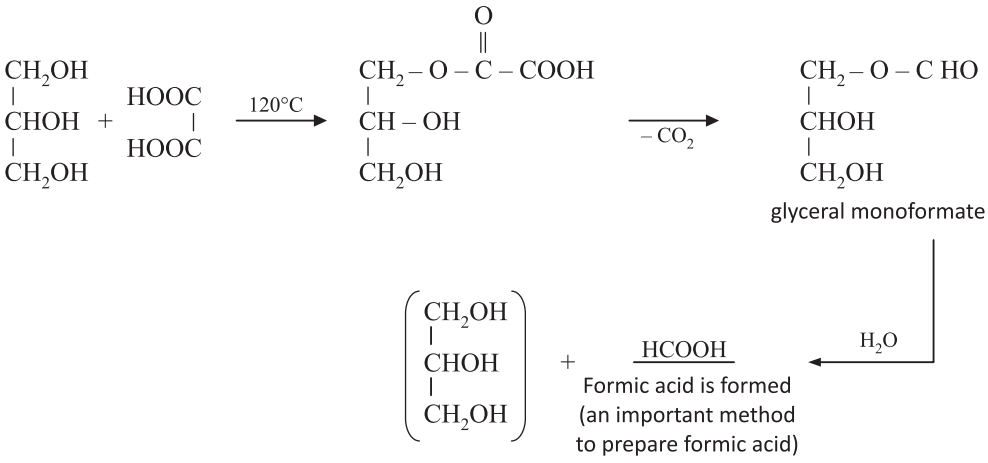


Reactions of Glycerol

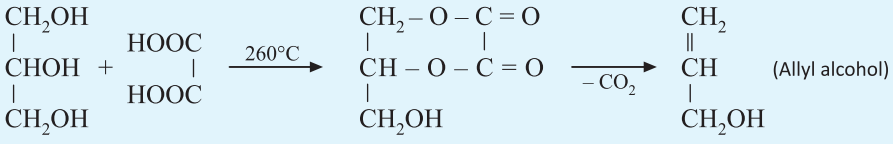
1. With conc. HNO_3



2. Reaction with Oxalic acid

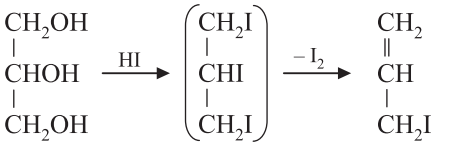


Note : If T = 260°C , allyl alcohol is formed.



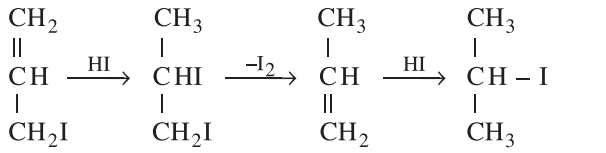
3. Action of HI

- If excess of glycerol is used.



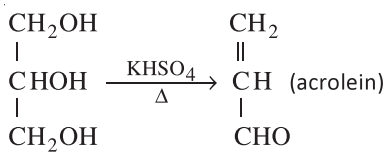
(allyl iodide)

- If excess of HI is used.



(Isopropyl iodide)

4. Dehydration



(acrolein)

Note :
- A mixture of glyceryl trinitrate and glycer yl dinitrate absorbed on kieselguhr (Porous earth) is dynamite, an explosive.
- Glycerol is used in the manufacture of polyster called glyptal, in medicines, cosmetics and in textile processing.
- Glycerol is miscible in water and is sweet in taste.

IN-CHAPTER EXERCISE - D

Choose the correct alternative. Only One Choice is Correct. Questions marked with '*' may have More than One Correct option.

1. *Glycerol* $\xrightarrow{KHSO_4}$ A $\xrightarrow{LiAlH_4}$ B

A and B are :

(A) *acrolein, allyl alcohol* **(B)** *glyceryl sulphate, acrylic acid*

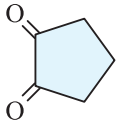
(C) *allyl alcohol, acrolein* **(D)** *only acrolein (B is not formed)*

2. *Allyl alcohol is obtained when glycerol reacts with the following at* 260°*C* :

(A) *Formic acid* **(B)** *Oxalic acid* **(C)** *Both* **(D)** *None*

3. *Oxidation product of* 1, 2-*cyclopentane-diol with* HIO_4 *is* :

(A) $OHC - CH_2 - CH_2 - CH_2 - CHO$ **(B)**



(C) $HOOC - CH_2 - CH_2 - CH_2 - COOH$ **(D)** *None is correct*