

19/MH501/422

### WMDREN QUEEN FREDRICK

#### CHM 102 (ASSIGNMENT ON ETHER)

1.  $\text{CH}_3\text{OCH}_3$   
IUPAC Name - Methoxy methane  
 $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$   
IUPAC Name - Ethoxyethane  
 $(\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2)_2\text{O}$   
IUPAC Name - 2-Methoxydiethylpropane  
 $\text{CH}_3\text{CH}_2\text{OCH}_3$   
IUPAC Name - Methoxyethane  
 $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_2\text{CH}_3$   
IUPAC Name - Ethoxypropane

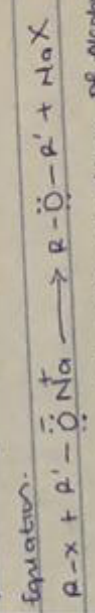
2 i. Polarity: Since the electronegativity of oxygen is greater than that of carbon, ethers are polar in nature. Moreover, the two C-O bonds in ether are inclined to each other at an angle of  $110^\circ$ , so the dipoles do not cancel each other, resulting in a net dipole moment.

ii. Boiling point: The boiling point of ethers is lower than that of isomeric alcohols because ethers do not form H-bonds within themselves.

iii. Solubility: Lower ethers (up to three carbon atoms) are soluble in water because they form hydrogen bonds with water molecules. Ethers are fairly soluble in organic solvents such as alcohols, benzene, acetone.

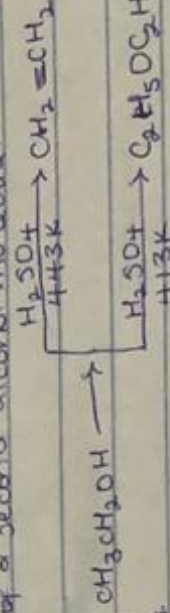
iv. Density: Ethers are lighter than water.

3. Preparation by Williamson synthesis  
In this method, an alkyl halide is reacted with sodium alkoxide which leads to the formation of ether. 2. The reaction generally follows the  $\text{S}_{\text{N}}2$  mechanism for primary alcohol.



ii. Preparation by dehydration of alcohols  
This method is a nucleophilic substitution reaction. The alcohol involved in reaction plays two roles: one alcohol in reaction plays two roles: one alcohol molecule acts as a substrate while the other acts as a nucleophile. It can follow either an  $\text{S}_{\text{N}}1$  or  $\text{S}_{\text{N}}2$  mechanism.

The choice of the mechanism depends on whether the protonated alcohol loses water before or simultaneously upon the attack of a second alcohol molecule.



4. i. It is used to make antifreeze, adhesives, detergents, polyester, etc

ii. It is used as a fumigant in certain agricultural products and as a sterilant for medical equipments and supplies

iii. It is produced in large volumes and used in the production of several industrial chemicals.