

1 Give the IUPAC names of the following compounds.

(a) CH_3OCH_3 - Dimethyl ether (Methoxymethane)

$\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxyethane.

$(\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$ - Butoxymethane.

$\text{CH}_3\text{CH}_2\text{OCH}_3$ - Methoxyethane.

$\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxypropane.

2 Discuss the properties of ethers.

i) Physical states: At room temperature ethers are colourless neutral liquid with pleasant odour. The lower aliphatic ethers are highly flammable gases or volatile liquids.

ii) Solubility: Ethers are less soluble in water than the corresponding alcohols. Lower molecular weight ethers such as methoxymethane and methoxyethane are fairly soluble in water since the molecules are able to form hydrogen bonds with the water molecules but as the hydrocarbon content of the molecules increases, there is a rapid decline in solubility.

They are miscible with most organic solvents.

iii) Density: Most of the simple ethers are less dense than water, although the density increases with increasing

relative molecular mass and some of the heavier others are in fact denser than water.

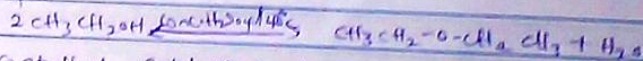
- ii) Reactivity: These are weak and moderate Lewis acids. Their inertness at moderate temperature leads to their wide use as reaction media.

3) Discuss explicitly two methods of preparing ethers and show equations of reaction.

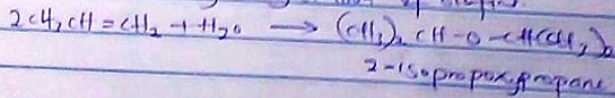
- i) Partial dehydration of alcohols: Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol is excess and concentrated tetraoxosulphate (vi) acid is used at a carefully maintained temperature of 140°C . This process is known as continuous etherification. If excess alcohol is not used, the temperature is as high as $170-180^{\circ}\text{C}$, further dehydration to yield alkenes occurs.



Example:



Controlled Catalytic hydration of alkenes.



4 state three use of ethylene oxide

- i) It is used as an intermediate in hydrolytic manufacturing of ethylene glycol.
- ii) It is used in preparation of nonionic emulsifying agents, plastic, plasticizers etc.
- iii) Ethylene oxide is used as a gaseous sterilizing agent.