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CHEMISTRY 102
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AERONAUTICAL ENGINEERING
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1. Give the IUPAC names of the following organic compounds
 $\text{CH}_3\text{OCH}_3 \rightarrow$ Methoxy methane
 $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3 \rightarrow$ Ethoxy ethane
 $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O} \rightarrow$ Butoxy methane
 $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3 \rightarrow$ Methoxy ethane
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{CH}_3 \rightarrow$ Ethoxy propane

2. Discuss the Properties of ethers

1. Physical states:

At room temperature, ethers are colorless, neutral liquids with pleasant odour. The lower aliphatic ethers are highly flammable gases or volatile liquids.

2. Solubility

Ethers are less soluble in water than are the corresponding alcohols. Lower molecular weight ethers such as methoxy ethane are fairly soluble in water since the molecules are able to form hydrogen bonds with the water molecules. However, as the hydrocarbon content of the molecules increases, there is a rapid decrease in solubility. They are miscible with most organic solvents.

3. Density

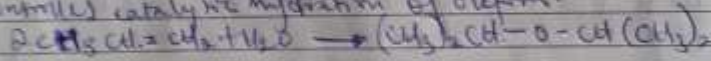
Most of the simple ethers are less dense than water, although the density increases with increasing relative molecular mass and some of the aromatic ethers are just denser than water.

3 discuss explicitly the methods of preparing ethane and give equation of reaction.

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



2. Controlled catalytic hydration of olefins.



4. Uses of ethylene oxide

- Ethylene oxide is used as an intermediate in the hydrolysis production of ethylene glycol.
- Ethylene oxide is used in the preparation of numerous crosslinking agents, plastics, plasticizers, textiles etc.
- Ethylene oxide is used as a gaseous sterilizing agent.