

- ① $\text{CH}_3\text{OCH}_3 \rightarrow$ Methoxymethane
- ② $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3 \rightarrow$ Ethoxyethane
- ③ $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O} \rightarrow$ Dibutyl ether
- ④ $\text{CH}_3\text{CH}_2\text{OCH}_3 \rightarrow$ methoxyethane
- ⑤ $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3 \rightarrow$ Ethoxypropane

2. Discuss the properties of ethers.

i. Physical states: Ethers are colorless, metallic liquids with pleasant smell at room temperature. The lower aliphatic ethers are highly flammable ethers gases or volatile liquids.

ii) Boiling point: Low molecular mass ethers have lower boiling points than its corresponding alcohols but for ethers containing more than four carbon atoms, the reverse is the case.

iii) Density: Most of the simple ethers are less dense than water, although the density increases with increasing molecular mass and some of the aromatic ethers are denser than water.

iv) Solubility: Ethers are less soluble in water than corresponding alcohols. Lower molecular weight ethers such as methoxymethane and methoxyethane are fairly soluble in water since the molecules are able to form hydrogen bond with the water molecules.

v) Reactivity: Ethers are inert at moderate temperature. Their inertness at moderate leads to their wide use of reaction media.

3. Discuss 2 methods of preparing ethers

1. Partial dehydration of alcohol: Simple ethers are manufactured from alcohol 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 continuous esterification. If excess alcohol is not used, the temperature should be as high as $170^\circ\text{C} - 180^\circ\text{C}$ further dehydration to yield alkene occurs.

