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- i) $\text{CH}_3\text{OCH}_3 \rightarrow$ methoxymethane
- ii) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3 \rightarrow$ Ethoxyethane
- iii) $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O} \rightarrow$ Butoxymethane
- iv) $\text{CH}_3\text{CH}_2\text{OCH}_3 \rightarrow$ methoxy ethane
- v) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3 \rightarrow$ Ethoxypropane

2) Properties of Ethers include:

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

ii) Solubility: Ethers are less soluble in water than are corresponding alcohols. Lower molecular weight ethers such as methoxymethane are fairly soluble in water.

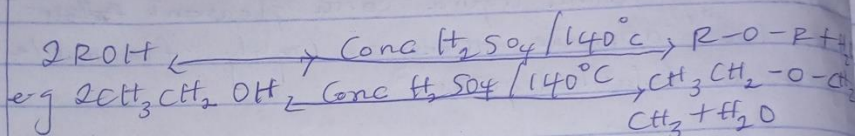
iii) Density: Most of the simple ethers are less dense than water although the density increases with increasing relative molecular mass and some of the aromatic ethers are in fact denser than water.

iv) Boiling point: Low molecular mass ethers have a lower boiling point than the corresponding alcohols but those ethers containing alkyl radicals larger than four carbon atoms, the reverse is true.

v) Reactivity: Ethers are inert at moderate temperature. Their inertness at moderate temperatures lead to their wide use as reaction media.

Preparation of Ethers -

- 1) Partial dehydration of alcohols: Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol in excess and concentrated tetraoxosulphate (VI) acid is heated at a carefully maintained temperature at 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 give alkenes occurs.



= Controlled catalytic dehydration of alkenes -
 $2\text{CH}_3\text{CH}=\text{CH}_2 + \text{H}_2\text{O} \rightarrow (\text{CCH}_3)_2\text{CH-O-CH}(\text{CCH}_3)_2$
 2-isopropoxypropane.

f) uses of Ethylene oxide

- 1) Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol.
- 2) Ethylene oxide is used in the preparation of non ionic emulsifying agent, plastics plasticizers and several synthetic textiles.
- 3) Ethylene oxide is used as a gaseous sterilizing agent.