$$2CH_3CH_2OH \xrightleftharpoons{\text{conc } H_2SO_4 / 140^\circ C} CH_3CH_2OCH_2CH_3 + H_2O$$

ii) From haloalkanes and dry silver(I) oxide:- A good example is

$$2CH_3CH_2CH_2Cl + Ag_2O \xrightarrow{\text{warm}} CH_3CH_2CH_2OCH_2CH_2CH_3 + 2AgCl$$

Propoxypropane

4.) State 3 uses of ethylene oxide

i) Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol.

ii) Ethylene oxide is used as a gaseous sterilizing agent.

iii) Ethylene oxide is used in the preparation of non-ionic emulsifying agents, plastics, plasticizers and several synthetic textiles.

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ASSIGNMENT

1) Give the IUPAC name of the following organic compounds.

i) CH_3OCH_3 – Methoxymethane

ii) $CH_3CH_2OCH_2CH_3$ – Ethoxyethane

iii) ~~$CH_3CH_2CH_2OCH_2CH_3$~~ $(CH_3CH_2CH_2CH_2)_2O$~~CH_3CH_2~~ → Butoxymethane

iv) $CH_3CH_2OCH_3$:– Methoxyethane

v) ~~OCH_3~~

vi) $CH_3CH_2CH_2OCH_2CH_3$ – Ethoxypropane

2) Discuss the properties of ethers

i) Physical states:– At room temperature, ethers are colourless, neutral liquids with pleasant odours. The lower aliphatic ethers are highhly flammable gases or volatile liquids.

ii) Solubility:– Ethers are less soluble in water than are the corresponding alcohols.

iii) Density:– Most of the simple ethers are less dense than water, although the density increases with increasing relative molecular mass and soms 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 leads to their ~~vide~~ wide we as a reaction media. Simple ethers are not found commonly in nature but the ether linkage is present in such natural products as sugars, starches and cellulose.

3) Discuss explicitly 2 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 in excess and concentrated tetraoxosulphate (VI) acid is heated at a carefully maintained temperature of 140°C. This process is known as complete etherification. If excess alcohol is not used, the temperature is as high as 170–180°C, further dehydration to yield alkene occurs. An example is