

Assignment of ether.

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i: $\text{CH}_3 \text{O} \text{CH}_3$
Methoxy methane.

ii: $\text{CH}_3 \text{CH}_2 \text{O} \text{CH}_2 \text{CH}_3$
Ethoxy ethane.

iii: $(\text{CH}_3 \text{CH}_2 \text{CH}_2 \text{CH}_2)_2 \text{O}$
Butoxy methane

iv: $\text{CH}_3 \text{CH}_2 \text{O} \text{CH}_3$
Methoxy ethane

v: $\text{CH}_3 \text{CH}_2 \text{CH}_2 \text{O} \text{CH}_2 \text{CH}_3$
ethoxy propane

2. Discuss the properties of ethers.

i. Physical states.

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

ii. Solubility

Ethers are less soluble in water than are the corresponding alcohols. Lower molecular weight ethers such as methoxy methane and methoxy ethane are fairly soluble in

Since the molecules are able to form hydrogen bonds with the larger molecules but as the hydrogen content of the molecules increases there is a rapid decline in solubility. They are miscible with most organic solvents.

19. Density.

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

20. Boiling point.

Low molecular mass ethers have a low boiling point than the corresponding alcohols but those ethers containing alkyl radicals larger than four carbon atoms, the reverse is true. The boiling point of ethers tend to approximate those of hydrocarbons of same relative molecular mass from which it can be concluded that the molecules are not associated in the liquid phase as there are no suitably available hydrogen for association through hydrogen bonds.

V. Reactivity

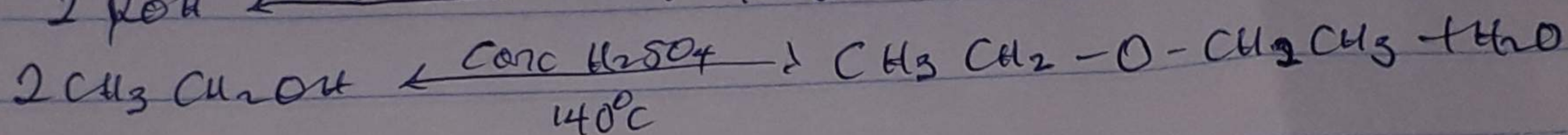
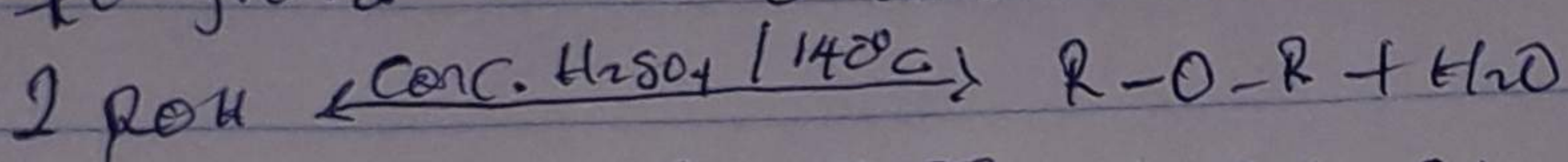
Ethers are inert at moderate temperature. Their inertness at moderate temperatures leads to their wide use as reaction media.

Simple ethers are not found commonly in nature but the ether linkage is present in such natural products as sugar, starches and cellulose.

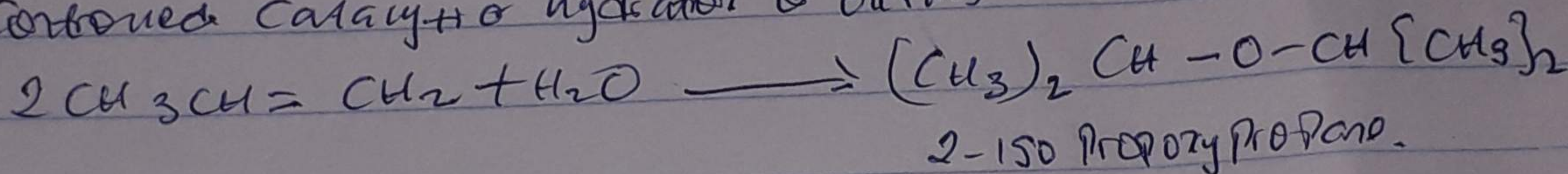
3 Discuss explicitly two methods of preparing ethers & show equation of reaction.

i. Partial dehydration of Alcohols.

Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol in excess and concentrated ~~tetra~~ tetraoxosulphuric 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 is ~~high~~ ^{as} high as $170-180^{\circ}\text{C}$, further dehydration to yield alkene occurs.



ii. Combined catalytic hydration of alkenes



4 State three uses of ethylene oxide

- i. Ethylene oxide is used as a gaseous sterilizing agent
- ii. Ethylene oxide is used in the preparation of monomers, emulsifying agents, plastics and several synthetic teretics.
- iii. Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol.