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CHEM 104 ASSIGNMENT

MBBS

19/MH501/192

- 1a  $\text{CH}_3\text{OCH}_3$  - methoxymethane
- b  $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$  - Ethoxypropane
- c  $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$  - Tetraoxymethane
- d  $\text{CH}_3\text{CH}_2\text{OCH}_3$  - Methoxyethane
- e  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$  - Ethoxypropane

## 2. Properties of ethers.

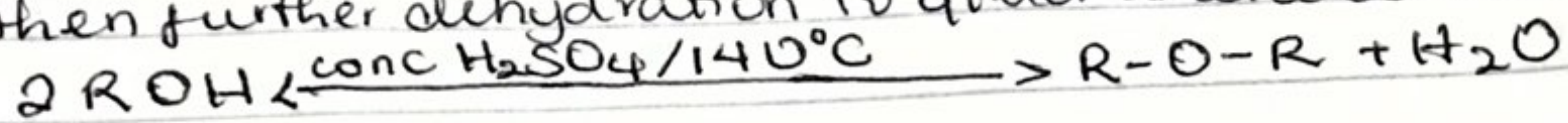
- a. **Physical State:** Ethers are colourless, <sup>neutral</sup> at room temperature with pleasant odours and are neutral liquids. Lower aliphatic ethers are highly flammable gases or volatile liquids.
- b. **Solubility:** They are less soluble in water than alcohols. Ethers with lower molecular weight such as methoxymethane and methoxyethane are fairly soluble in water. They are miscible with most organic solvents.
- c. **Reactivity:** Ethers are inert at moderate temperature which leads to their wide use as reaction media.
- d. **Boiling point:** ethers with a lower molecular mass have a lower boiling point than corresponding alcohols but ethers containing alkyl radicals larger than four carbon atoms, the reverse is true.
- e. **Density:** most simple ethers are less dense than water, although the density increases with increasing relative molecular mass and some aromatic ethers are denser than water.

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3. Methods of preparing ethers.

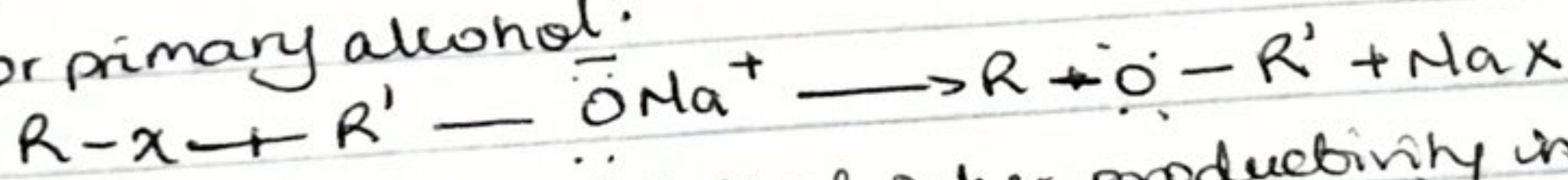
a. <sup>By</sup> Partial dehydration of alcohols.

Ethers can be manufactured from alcohols by catalytic dehydration. The alcohol in excess and concentrated  $(H_2SO_4)$  Tetraoxosulphate(VI) acid is heated at a carefully maintained temperature of  $140^\circ C$ . This process is known as continuous esterification. If the excess alcohol is not used, the temperature is as high as  $170-180^\circ C$  - then further dehydration to yield alkene occurs.



b. by Williamson Synthesis

This is used to prepare symmetrical and asymmetrical ethers in laboratories. In this method, an alkyl halide is reacted with sodium alkoxide which leads to the formation of ether. The reaction generally follows the  $S_N2$  mechanism for primary alcohol.



This ~~attrib~~ exhibits higher productivity in the case of primary alkyl halides.

4. Uses of Ethylene oxide

- It is used as a gaseous sterilizing agent
- It is used as an intermediate in the hydrolytic manufacture of ethylene glycol.
- It is used in the preparation of nonionic emulsifying agents, plastics, plasticizers and several synthetic textiles.