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1. Give the IUPAC names of the following compounds

$\text{CH}_3\text{OCH}_3$  - Methoxymethane

$\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$  - Ethoxyethane

$(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$  - Dibutoxyethane

$\text{CH}_3\text{CH}_2\text{OCH}_3$  - Methoxyethane

$\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$  - Ethoxypropane

2. Discuss the properties of ethers

Ethers are generally classified into two categories on the basis of substituent groups attached. Ethers exhibit a wide range of physical and chemical properties.

Some of these properties are discussed below!

~~Physical~~ Properties of Ethers

1. An ether molecule has a net dipole moment due to the polarity of C-O bonds.

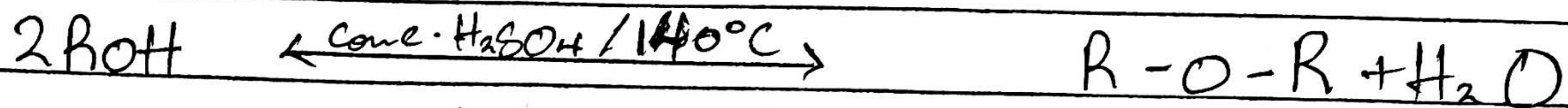
2. The boiling points of ethers is comparable to alkanes but much lower than that of alcohols of comparable molecular mass despite the polarity of the C-O bond. The miscibility of ethers with water resemble those of alcohol.

3. Ethers at room temperatures are colourless, neutral liquid with pleasant liquid odours.

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

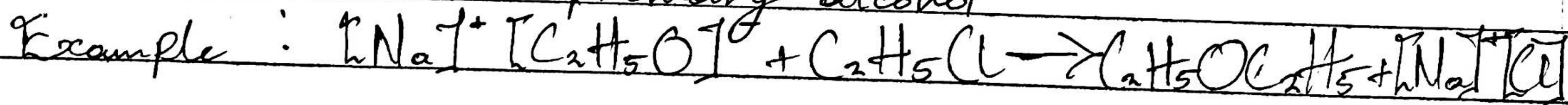
### 3i) Partial Dehydration of alcohols

Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol is excess and concentrated tetraoxosulphate (vi) acid is heated at a carefully ~~temp~~ maintained temperature at  $140^{\circ}\text{C}$ . This process is known as etherification. If excess alcohol is <sup>not</sup> used, the temperature is as high as  $170 - 180^{\circ}\text{C}$ , further dehydration to yield alkene occurs -



### (ii) Preparation of Ethers by Williamson Synthesis

Williamson synthesis is an important method for the preparation of symmetrical and asymmetrical ethers in the laboratory. In this method, we carry out a reaction of an alkyl halide with sodium alkoxide which leads to the formation of the ether. The reaction generally follows  $\text{S}_\text{N}^2$  mechanism for primary alcohol.



4i) Ethylene oxide is used as a gaseous sterilizing agent.

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

(iii) Ethylene oxide is used in the preparation of ~~various~~ various emulsifying agents, plastics, plasticizers and several synthetic textiles.