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1.)  $C H_3 O C H_3 \Rightarrow$  Methoxy methane (Dimethylether)

$C H_3 C H_2 O C H_2 C H_3 \Rightarrow$  Ethoxyethane (Diethylether)

$(C H_3 C H_2 C H_2 C H_2)_2 O \Rightarrow$  Butoxymethane (Dibutylether)

$C H_3 C H_2 O C H_3 \Rightarrow$  Methoxy ethane

$C H_3 C H_2 C H_2 O C H_2 C H_3 \Rightarrow$  Ethoxypropane

2.) Discuss the properties of ethers

Solubility

Physical states  $\rightarrow$  At room temperatures, ethers



## 2.) Discuss the properties of ethers

### Solubility

Physical States → At room temperatures, ethers are colourless, neutral, and highly flammable liquids with pleasant odors. The lower aliphatic ethers are highly flammable gases or volatile liquids.

Solubility → Ethers are less soluble in water than are the corresponding alcohols. Lower molecular weight ethers such as methoxymethane and methoxyethane are fairly soluble in water since the molecules are able to form hydrogen bonds with the water molecules, but as the hydrocarbon content of the molecules increases, there is a rapid decline in solubility.

Density → Most of the simple ethers are less dense than water, although the density increases with increasingly relatively molecular mass and some of the aromatic ethers are in fact denser than water.

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

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

## 3.) Partial Williamson's synthesis

Mixed or simple ethers of definite structure may be synthesized by Williamson's synthesis. The process involves the displacement of a halogen from an haloalkane by an alkoxide (alkylate) or phenoxide (phenate) ion.



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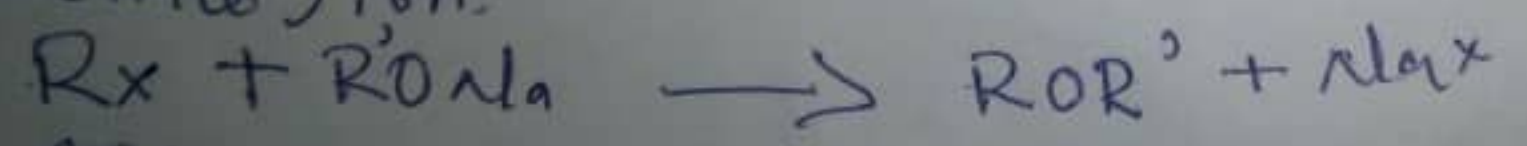
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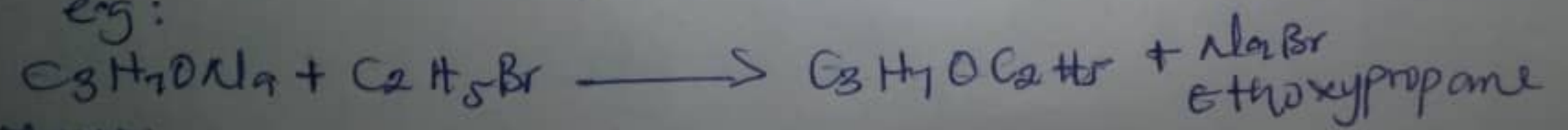
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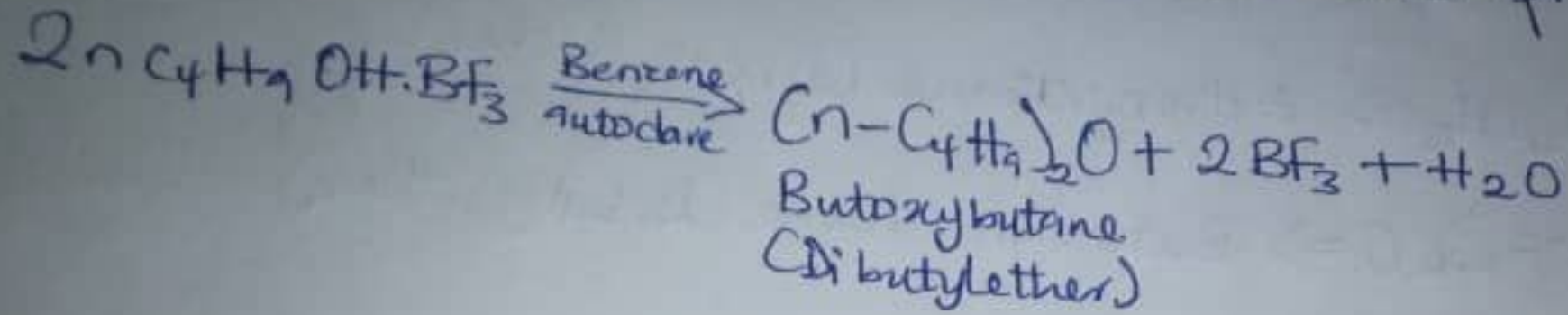
eg:



~~NaX~~



b) Reaction of boron trifluoride alcoholates  
Heating of boron trifluoride alcoholates under pressure yield simple  
ethers.



- 4.) State three uses of ethylene oxide
- It is used as an intermediate in the hydrolytic manufacture of ethylene glycol.
  - Ethylene oxide is used in the preparation of nonionic emulsifying agents, plasticizers and several synthetic textiles.
  - Ethylene oxide is used as a gaseous sterilizing agent.