

19/MHS01/043

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MATIC No. MHS01/043  
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COURSE: CHM 102

- 1a)  $\text{CH}_3\text{OCH}_3 \longrightarrow$  Methoxy methane  
b)  $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3 \longrightarrow$  Ethoxy ethane  
c)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{CH}_3 \longrightarrow$  Butoxy butane  
d)  $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_2\text{CH}_3 \longrightarrow$  Methoxy ethane  
e)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{CH}_3 \longrightarrow$  Ethoxy propane

2) Discuss the properties of ethers

a) PHYSICAL STATE: Ethers are colorless, neutral liquids at room temperature. The lower aliphatic ethers are volatile liquids or highly flammable gases.

b) DENSITY: This increases with increasing relative molecular mass.  
Most simple ethers are less dense than water.

c) SOLUBILITY: Ethers are less soluble in water than are the corresponding alcohols.

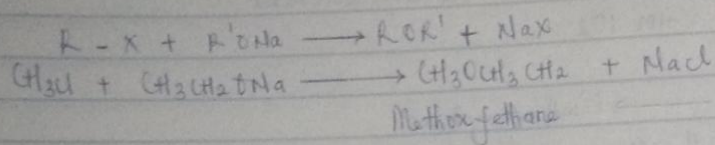
d) BOILING POINT: Ethers with low molecular mass have a lower boiling point than the corresponding alcohols but those ethers containing alkyl radicals larger than four (4) carbon atoms, the reverse is true.

e) REACTIVITY: Ethers are inert at moderate temperatures.

a) WILLIAMSON SYNTHESIS

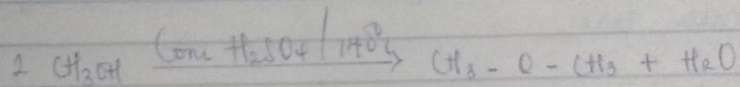
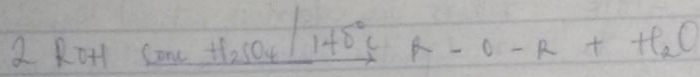
In Williamson's synthesis, the alkyl halides (primary and secondary) react with sodium alkoxide (K<sup>+</sup>ONa) or potassium alkoxide (K<sup>+</sup>OK) to produce ethers. Tertiary alkylhalides are not

used in this synthesis because tertiary alkyl halides prefer to undergo elimination instead of substitution



### 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 temperature of  $140^\circ\text{C}$ . This process is called "CONTINUOUS FETTERIZATION".



- ) It is used as a gaseous sterilizing agent
- ) Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol.
- ) It is used in preparation of several synthetic textiles.