

Name: Marshall, Edward Otu
Dept: Mechatronics Engineering
Course code: CHM 102
Matric no: 19/ENG 05/085

Assignment

i) CH_3OCH_3
Methoxy methane

ii) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$
Ethoxy ethane

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

iv) $\text{CH}_3\text{CH}_2\text{OCH}_3$
Methoxy ethane

v) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$
Ethoxy propane

2) General properties of ethers

i) Physical state

At room temperature, ethers are colourless, neutral liquids with pleasant odours. Lower aliphatic ethers are highly flammable gases or volatile liquids.

ii) Solubility

Ethers are less soluble in water than their corresponding alcohols. Ethers with low molecular weights are slightly soluble but solubility declines with an increase in the hydrocarbon content of the molecule.

ii) Density

Most of the simple ethers are less dense than water. Density increases with increasing relative molecular mass.

iii) Boiling point:

Low molecular mass ethers have a lower boiling point than their corresponding alcohols. Ethers with alkyl radicals larger than four carbon atoms have relatively higher boiling points than their corresponding alcohols.

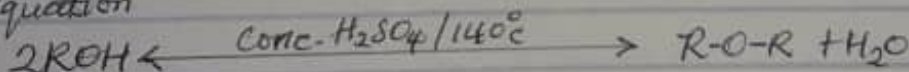
iv) Reactivity

Ethers are inert at moderate temperature.

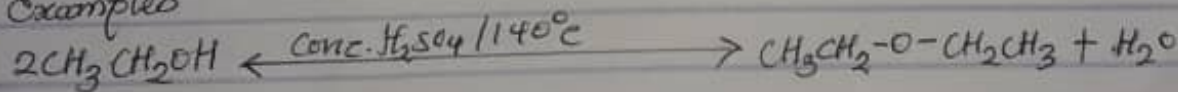
v) Partial dehydration of alcohols

Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol in excess and concentrated (vii) as tetraoxosulphate (vi) acid is heated at a carefully maintained temperature of 140°C . This process is known as the continuous etherification. If excess alcohol is not used, the temperature will be as high as 170°C - 180°C and dehydration to yield alkene occurs.

Equation



Example

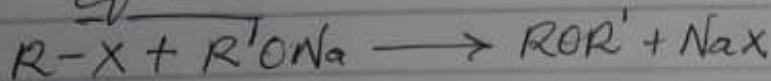


ii) Williamson's synthesis

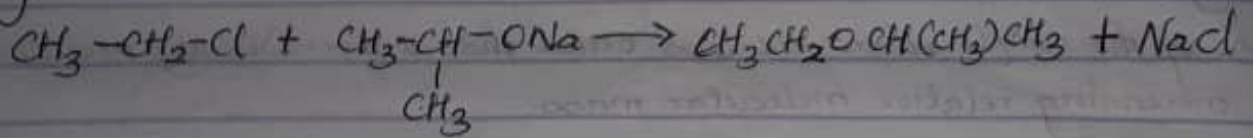
Here, alkyl halides (primary and secondary) react with $\text{R}'\text{ONa}$ (sodium alkoxide) or $\text{R}'\text{OK}$ (potassium alkoxide) to produce ethers.

Tertiary alkyls are not used in Williamson's synthesis because they will undergo elimination instead of substitution.

Equation



E.g



- 4.) i) Ethylene oxide is used as a gaseous sterilizing agent
ii) Ethylene oxide is used in the preparation of non-ionic emulsifying agents.
iii) Ethylene oxide is used as an intermediate in the production of various chemical compounds e.g ethylene glycol