IHECHERE NNABUEZE WILSON
19/MHS01/198
MBBS
CHM 102
Assignment 2

1 Give the IUPAC names of the following organic compounds

CH_3OCH_3 - Methoxymethane

$CH_3CH_2OCH_2CH_3$ - ethoxyethane

$(CH(CH_2CH_2CH_2)_2O$ - Butoxymethane

$CH_3CH_2OCH_3$ - methoxyethane

$CH_3CH_2CH_2OCH_2CH_3$ - ethoxypropane

2 Discuss the properties of ethers

2 Discuss the properties of ethers

+ Density: Most simple ethers are less dense than water, although density increases directly proportionally with increasing relative molecular mass and some aromatic ethers are denser than water

+ Physical state: Ethers are colourless, neutral liquids with pleasant odours at room temperature. Lower aliphatic ethers are highly flammable gases or volatile liquids

* Solubility: Ethers are less soluble in water than alcohols. Low molecular weight ethers (i.e methoxymethane & methoxyethane) are fairly soluble in water because the molecules can form hydrogen bonds with water but as hydrocarbon content increases, there is rapid decline in solubility. They are miscible with most organic solvents

+ Reactivity: Ethers are inert at moderate temperature. This leads to their wide use as reaction media. Simple ethers can be found commonly in nature but the ether linkage is present in natural products i.e sugar, starches and cellulose.

+ Boiling point: Ethers with low molecular mass have low boiling points than their corresponding alcohols. Both ethers containing alkyl radicals larger than four carbon atoms have a reversed case. The boiling point of ethers tend to approximate those of hydrocarbons of same relative molecular mass for which it can be concluded that the molecules are not associated in the liquid phase as they are no suitably available hydrogen for association through hydrogen bonds.

3 Dis... ethers and sho...

3 Discuss explicitly two methods of preparing ethers and show equations of reaction.

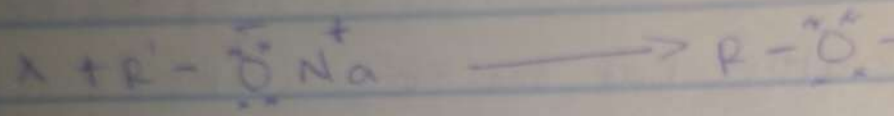
+ Dehydration of ethers by dehydration of alcohols:
In the presence of sulphuric acids, alcohol undergoes dehydration to produce alkenes and then ethers under different conditions. In the presence of sulphuric acid, dehydration of alcohol yields ethoxyethane at 140°C. This is an ideal method of preparation using primary alcohols

$$2\,CH_3CH_2OH \xrightarrow{\text{conc. } H_2SO_4/140^\circ C} CH_3CH_2-O-CH_2CH_3 + H_2O$$

+ Preparation of ethers by Williamson synthesis:
Williamson synthesis is an important method of preparation of symmetrical and assymmetrical ethers in labs. It involves the reaction of an alkyl halide with sodium alkoxide which leads to the formation of ether. The reaction follows

Uses of ethylene oxide

SN2 mechanism of primary alcohol.



- State three uses of ethylene oxide
- Ethylene oxide is used as a gaseous sterilizing agent
- Ethylene oxide is used as an intermadiate in the hydrolytic manufacture of ethylene glycol.