CHM 102
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MBBS

(1) Give the IUPAC names of the following organic compounds
a. CH_3OCH_3 – Methoxy Methane
b. $CH_3CH_2OCH_2CH_3$ – Ethoxy Ethane
c. $(CH_3CH_2CH_2CH_2)_2O$ – Butoxy Butane
d. $CH_3CH_2OCH_3$ – Methoxy Ethane
e. $CH_3CH_2CH_2OCH_2CH_3$ – Ethoxy Propane.

(2) Discuss the properties of ethers
Physical State: ethers are colourless, neutral liquids at room temperature with a pleasant odour. Lower aliphatic ethers are highly flammable or volatile gases.
Solubility: ethers are less soluble in water than in corresponding Alcohols. Lower molecular weight ethers are fairly soluble in water but as the hydrogen content increases there is a rapid decline in solubility. They are miscible with most organic solvents.
Density: most ethers are less dense than water, density increases with increasing molecular mass and some aromatic ethers are denser than water.
Boiling point: Lower molecular mass ethers have lower boiling point than the corresponding Alcohols
Reactivity: ethers are inert at moderate temperatures, this leads to their wide use as reaction media.

Discuss explicitly two methods of Preparing ethers and show equations of reaction.

3. (I) Partial dehydration of alcohols

-Simple ethers are manufactured From Alcohols by Catalytic dehydration.

$$2\,CH_3CH_2OH \xrightarrow[140^\circ C]{Conc\ H_2SO_4} CH_3CH_2-O-CH_2CH_3 + H_2O$$

(2) From Haloalkanes and dry Silver(I)oxide

$$2\,CH_3CH_2CH_2Cl + Ag_2O \xrightarrow{warm} CH_3CH_2CH_2OCH_2CH_2CH_3 + 2AgCl$$

4. State three uses of ethylene oxide

(I) is used as an intermediate in the hydrolytic manufacture of ethylene glycol

(II) is used in the preparation of nonionic emulsifying agents, plastics, plasticizers and several synthetic textiles.

(III) Ethylene oxide is used as a gaseous sterilizing agent.