AFINIHI JOHN
Computer Engineering
CHM 102
Assignment

1 Give the IUPAC names of the following organic Compounds
CH_3OCH_3 – Methoxymethane
$CH_3CH_2OCH_2CH_3$ – Ethoxyethane
$(CH_3CH_2CH_2CH_2)_2O$ – Buthoxymethane
$CH_3CH_2OCH_3$ – Methoxyethane
$CH_3CH_2CH_2OCH_2CH_3$ – Ethoxypropane

2 Discuss the properties Of ethers
- Physical states :- At room temperature, ethers are colourless, neutral liquids with pleasant odours. The lower aliphatic ethers are highly flammable gases or volatile liquids.

- Solubility :- Ethers are less soluble in water than the corresponding alcohols. lower molecular weight ethers such as methoxyethane are fairly soluble in water since the molecule 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. They are miscible with most organic solvents.

- Density :- Most of the simple ethers are less dense than water although the density increases with increasing relative molecular mass and some of the aromatic ethers ~~is~~ are in fact denser than water.

- Boiling Point :- Low molecular mass ether have a lower boiling point than the corresponding alcohols but those ethers containing alkyl radicals larger than four carbon atoms, the reverse is true. The boiling point of ethers tend to approximate those of hydrocarbons of same

relative molecular mass from which it can be concluded that the molecules are not associated in the liquid phase as there are no suitably available hydrogen for association through hydrogen bonds.

- Reactivity :- Ethers are inert at moderate temperature. Their inertness at moderate temperature leads to their wide use as reaction ~~idea~~ medium.

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

- 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 carefully maintained temperature of 140°C. This process is known as continuous etherification. If excess alcohol is not used, the temperature is as high as 170 – 180°C dehydration to yield alkene occurs

$$2ROH \xrightarrow{Conc.\ H_2SO_4/140^\circ C} R-O-R + H_2O$$

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

- From Haloalkanes and dry silver (I) oxide

$$2RX + Ag_2O \xrightarrow{warm} R-O-R + 2AgX$$

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

Propoxypropane

4 State three uses of ethylene oxide

- Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol.
- Ethylene oxide is used in the preparation of nonionic emulsifying agents, plastics, plasticzers and several synthetic textiles
- Ethilene oxide is used as a gaseous sterilizing agents.