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DEPT: MEDICAL LABORATORY SCIENCE

COURSE: CHM 102

Assignment

1. Give the IUPAC names of the following compounds

(a) CH_3OCH_3 - Dimethyl ether (methoxymethane)

$\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxyethane

$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{O}$ - Butoxyethane

$\text{CH}_3\text{CH}_2\text{OCH}_3$ - Methoxyethane

$\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxypropane

2. Discuss the properties of ethers.

i. Physical state: At room temperature ethers are ^{colorless} neutral liquid with pleasant odors. The lower aliphatic ethers are highly flammable gases or volatile liquids.

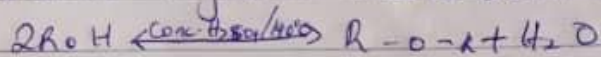
ii. Solubility: Ethers are less soluble in water than the corresponding alcohols. Lower molecular weight ethers such as methoxymethane and methoxyethane are fairly soluble in water since the molecules are able to form hydrogen bonds with the water molecules but as the hydrocarbon content of the molecule increases, there is a rapid decline in solubility. They are miscible with most organic solvent.

iii. Density: Most of the simple ethers are ~~less~~ denser than water, although the density increases with increase in relative molecular mass and some of the complex are in fact denser than water.

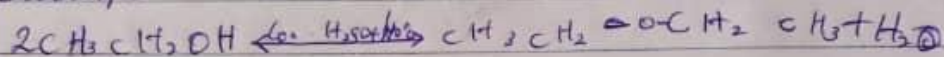
iv. Reactivity: Ethers are ^{inert} at moderate temperatures, their inertness at moderate temperature leads to their wide usage as reaction media.

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

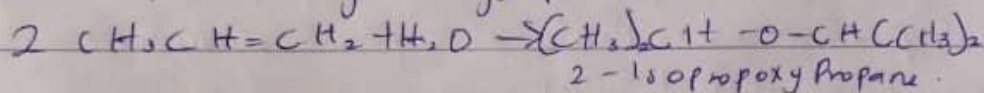
i. partial dehydration of alcohols! simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol in excess and concentrated tetraoxosulphate (VI) acid is heated at a carefully maintained temperature of 140°C . This process is known as controlled etherification of. If excess alcohol is not used, the temperature is as high as $170-180^{\circ}\text{C}$, with dehydration to yield alkene occurs



Example



ii. Controlled catalytic hydration of alkenes.



4 state three uses of ethylene

- i. it is used as an intermediate in hydrolytic manufacturing of ethylene glycol
- ii. It is used in preparation of nonionic emulsifying agents, plastic, plasticizers etc.
- iii. Ethylene oxide is used as a gaseous sterilizing agent.