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Matric no: 19/MT/SH/1067

Dept: Pharmacy

1. CH_3OCH_3
Methoxymethane

$\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$
2-ethoxyethane

$(\text{CH}_2\text{CH}_2\text{O})_2$
Dioxane

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

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

2. Physical states.

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

- Solubility

Ethers are less soluble in water than are 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 hydrogen to oxygen 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 are in fact denser than water.

- Boiling point

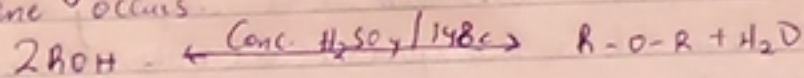
Low molecular mass ethers have a lower boiling point than the

- Corresponding alcohols but those ether having alkyl radicals larger than four carbon atoms, the reverse is true. Boiling points of ethers tends to approximate those 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 hydrogens for association through hydrogen bonds.

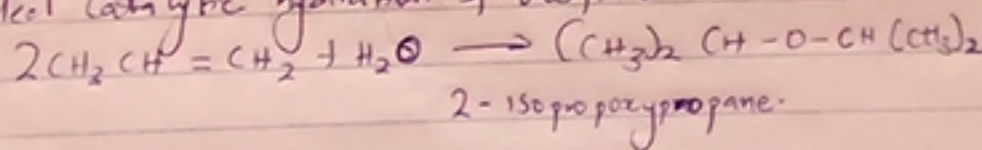
5. Reactivity: Ethers are inert at moderate temperature. Their inertness at moderate temperature leads to their wide use as reaction medium. Simple ethers are not found commonly in nature but the ether linkage is present in such natural product as sugar, starch and cellulose.

3.1 Partial dehydration of alcohols.

Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol in excess and concentrated H_2SO_4 sulphate (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 $170-180^\circ\text{C}$, further dehydration to yield alkene occurs.



2) Controlled catalytic hydration of olefins.



4. Uses of ethylene oxide.

- i. It is used to make antifreeze, adhesives, detergents, polyester and pesticides.
- ii. It is used to sterilize agents for medical equipment.
- iii. It is also used as a fumigant in certain agricultural products.