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CHM 102.

1. The IUPAC names of the following Organic Compounds;
i CH_3OCH_3 - Methoxy methane
ii $CH_3CH_2OCH_2CH_3$ - Ethoxyethane
iii $CH_3CH_2OCH_3$ - Methoxyethane
iv $(CH_3CH_2CH_2CH_2)_2O$ - Butoxymethane
v $CH_3CH_2CH_2OCH_2CH_3$ - Ethoxy Propane.

2. Properties of ethers.
- Physical state :- 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 methoxymethane are fairly soluble in water since the molecule are able to form hydrogen bonds with the water molecules.

- Reactivity :- Ethers are inert at moderate temperature. Their inertness at moderate temperatures leads to their wide use as reaction media.

3 Methods of Preparing Ethers.
- 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.

$$2CH_3CH_2OH + H_2SO_4 \longrightarrow CH_3CH_2OCH_2CH_3 + H_2O$$

- Controlled catalytic hydration of olefins:

$2CH_3CH=CH_2 + H_2O \rightarrow (CH_3)_2CH-O-CHC(CH_3)_2$

2-Isopropoxy propane.

From haloalkanes and dry silver(I) oxide.

$2RX + Ag_2O \xrightarrow{warm} ROR + 2AgX$

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

4. Uses of ethylene oxide.

- It is made industrially by oxidation of ethylene with air over a silver catalyst.

i It is used as an intermediate in the hydrolytic manufacture of ethylene glycol.

ii It is used in the preparation of nonionic emulsifying agents, plastics, plasticizers and several synthetic textiles.

iii It is used as a gaseous sterilizing agent.