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College/Department - MHS/MLS

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COURSE CODE - CHM 102

a) CH_3OCH_3 - Methoxymethane

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

c) $[\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2]_2\text{O}$ - Butoxymethane

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

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

2) Physical States - At room temperature ethers are colourless neutral liquids with pleasant Odours. The lower aliphatic ethers are highly flammable gases or volatile liquids.

i) Solubility - Ethers are less soluble in water than their 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 molecules increases, there is a rapid decline in solubility and they are miscible with most organic solvents.

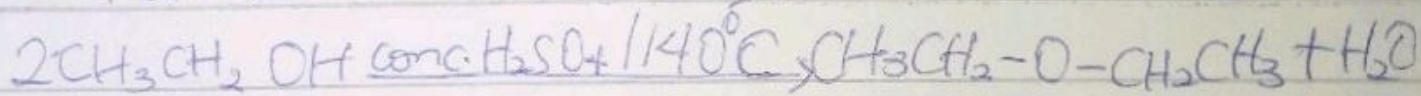
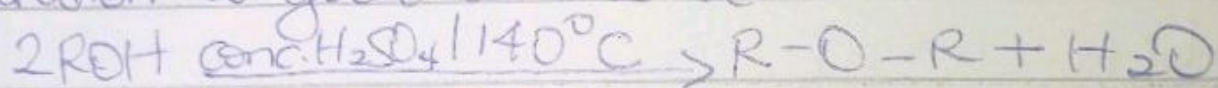
ii) Density - Most simple ethers are less dense than water, although density increases with increase in relative molecular mass and some of the aromatic ethers are in fact denser than water.

iii) Boiling point - Ethers with low molecular mass have a lower boiling point than their corresponding alcohols but those ethers

containing alkyl radicals larger than four carbon atoms, the reverse is true. Boiling points of ethers tend to approximate those of the 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.

V) Reactivity - Ethers are inert at moderate temperature and their inertness at moderate temperatures leads to their wide use as reaction media. Simple ethers are not found commonly in nature but the ether linkage is present in such natural products as sugars, starches and cellulose.

3) Partial dehydration of alcohols - Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol is in excess and conc. tetraoxosulphate(VI) acid is heated at a carefully maintained temperature of 140°C , this process is called 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

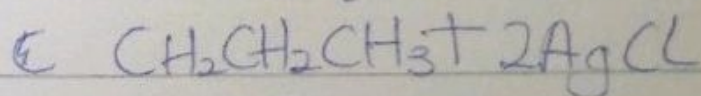
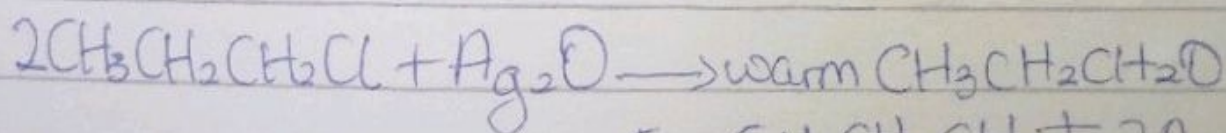
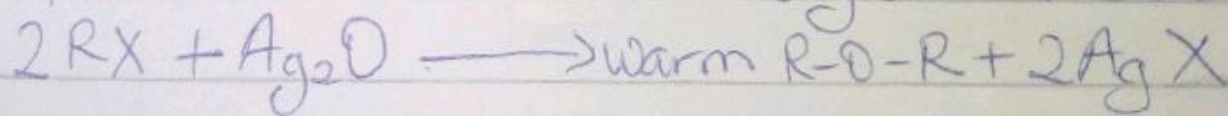


ii) Controlled catalytic hydration of alkenes



2- isopropoxypropane [CH₃]₂

From haloalkanes and dry silver (I) oxide



Propoxypropane

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

b) Ethylene Oxide is used as a gaseous sterilizing agent.

c) It is used in the preparation of non-ionic emulsifying agents, plastics and several synthetic textiles.