

Olunole-010 Olunwagbemi

14/MAY/2013/3+2

Assignment

- ① CH_3OCH_3 — Methoxymethane
 $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ — Ethoxyethane
 $(\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$ — Butyrymethane
 $\text{CH}_3\text{CH}_2\text{OCH}_3$ — methoxyethane
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$ — Ethoxypropane.

② Properties of Ethers

(i) Physical states: At room temperature, ethers are colourless neutral liquids with pleasant odours. The lower aliphatic ethers are highly inflammable gases or volatile liquids.

(ii) Solubility: Ethers are less soluble in water than they are in 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.

(iii) Density: Most simple ethers are less dense than water although the density increases with increasing relative molecular mass and some of the aromatic ethers are denser than water.

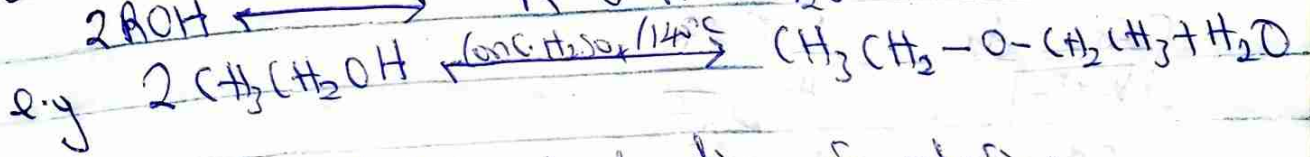
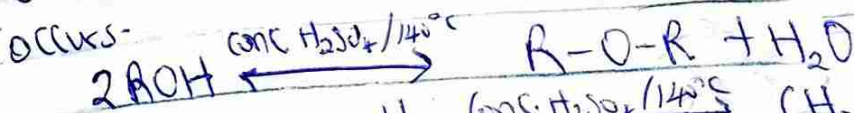
(iv) Boiling point: Low mass ethers have a lower boiling point than the corresponding alcohols but those ethers containing alkyl radicals longer than four carbon atoms, the reverse is true. The boiling point of ethers tend to approximate those of hydrocarbons of same relative molecular mass from which it can be concluded that the molecules are not associated through hydrogen bonds.

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

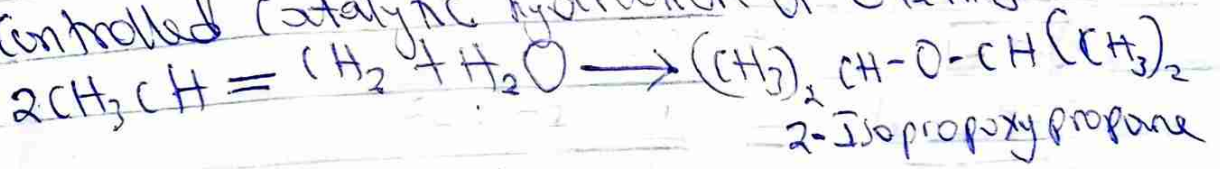
③ Methods of preparing Ethers

(i) Partial dehydration of alcohols.

Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol in excess and concentrated H_2SO_4 acid is heated at a temperature of $140^\circ C$. Process is known as continuous esterification. If excess alcohol is not used, the temperature is as high as $170-180^\circ C$, further dehydration to yield alkene occurs.



(ii) Controlled catalytic hydration of olefins.



④ uses of ethylene oxide.

(i) Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol.

(ii) It is used in the preparation of non ionic emulsifying agents, plasticizers and several synthetic textiles.

(iii) It is used as a gaseous sterilizing agent.