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19/ENG05/1007
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CHM 102

(1) CH_3OCH_3 → methoxymethane

$CH_3CH_2OCH_2CH_3$ → ethoxyethane

$(CH_3CH_2CH_2CH_2)_2O$ → Buthoxy Butane

$CH_3CH_2OCH_3$ → methoxy ethane

$CH_3CH_2CH_2OCH_2CH_3$ → ethoxy propane

2 Discuss the properties of ethers

General

(i) Physical states – At room temperature, ethers are colorless neutral liquids with pleasant odurs. The lower aliphatic ethers are highly flammable gasses

(ii) Density – Most of the simple ethers are less dense than water, although the density increases with increasing relative molecular mass.

(iii) Solubility – ethers are less soluble in water than are the corresponding alcohols. lower molecular weight ethers such as methoxymethane are fairly soluble in water.

(iv) Reactivity – Ethers are inert at moderate temperature. Their inertness at moderate temperature leads to their wide use as reaction media

(3) Manufacture and Preparation of Ethers

1 Partial dehydration of alcohols. Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol in excess and Conc. H_2SO_4 is heated at a carefully maintained temp of 140°c. This process is known as Continuous esterification. If excess alcohol is not used, the temperature is as high as 170-180°c, further dehydration to yield alkene occurs.

$$2ROH \xleftarrow{Conc\ H_2SO_4\ /\ 140^\circ C} R-O-R + H_2O$$

Examples:

$$2CH_3CH_2OH \xleftarrow{Conc\ H_2SO_4\ /\ 140^\circ} CH_3CH_2OCH_2CH_3 + H_2O$$

2 Controlled Catalytic hydration of olefins:

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

2-Isopropoxy propene

(4) 3 uses of ethylene oxide.

(1) It is used as an intermediate in the hydrolytic manufacture of ethylene glycol

2 It is used as a gaseous sterilizing agent

3 It is used in the production of plastics.

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