

NAME; ONOSI OGHENYOMA EMMANUEL

DEP; COMPUTER ENGINEERING.

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COURSE; CHM 102.

(1) CH_3OCH_3 Methoxymethane.

$\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ Ethoxyethane.

$\text{C}(\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$ Butoxybutane.

$\text{CH}_3\text{CH}_2\text{OCH}_3$ 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 flammable gases or volatile liquids.

(ii) 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 hydrocarbon content of the molecules increases, there is a rapid decline in solubility. They are miscible with most organic solvents.

(3) 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.

(4) Boiling point; Low molecular mass ethers have a lower boiling point than the corresponding alcohols but those ethers containing

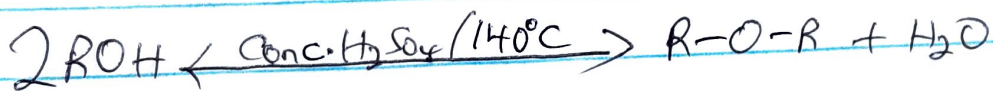
alkyl radicals larger than four carbon atoms, the reverse is true.

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

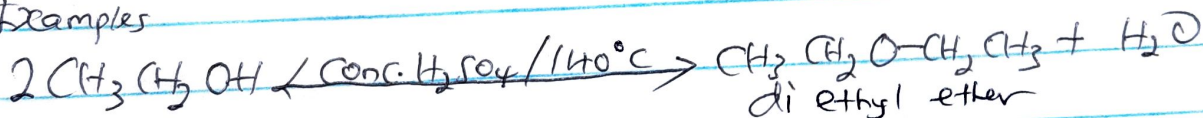
(3) PREPARATION OF ETHERS

(i) 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. If excess alcohol is not used, the temperature is as high as $170-180^{\circ}\text{C}$, further dehydration to yield alkene occurs.

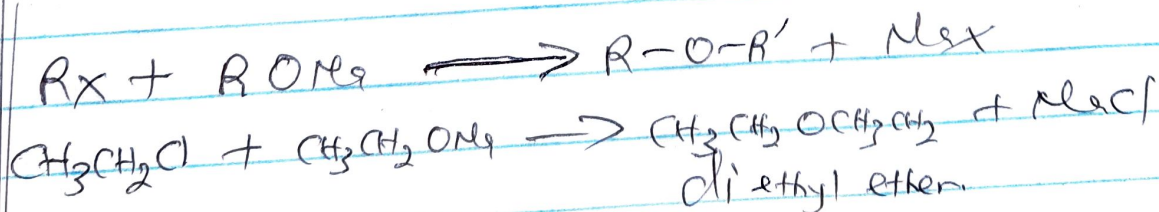


Examples



(2) Preparation of Ethers by Williamson Synthesis

In this method, an alkyl is reacted with sodium alkoxide which leads to the formation of ether.



(i) It is used in the production of antifreeze.

(ii) It is used in the production of adhesives.

(iii) It is used in the production of detergents.