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MBBS

CHM 102 Assg on Ethers

| 1.) Organic Compounds | Iupac names |
|---|---|
| a.) $CH_3OCH_3$ | Methoxymethane |
| b.) $CH_3CH_2OCH_2CH_3$ | Ethoxyethane |
| c.) $(CH_3CH_2CH_2CH_2)_2O$ | Butoxymethane |
| d.) $CH_3CH_2OCH_3$ | Methoxyethane |
| e.) $CH_3CH_2CH_2OCH_2CH_3$ | Ethoxypropane |

2.) Properties of ~~fstt~~ Ethers

- Physical states: At room temp, they are colourless, neutral liquids with pleasant odours. The lower aliphatic ethers are highly flammable gases ~~of~~ or volatile liquids.
- Solubility: Ethers are less soluble in water than corresponding alcohols. They are miscible with most organic solvents.
- 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 infact denser than water.
- Reactivity: Ethers are inert at moderate temperature. Their inertness at moderate temperature leads to their wide use as rxn media.

3.)- Methods of Preparing Ethers with Exns

- Partial Dehydration of Alcohols: Simple ethers are manufactured from alcohols by Catalytic dehydration. The alcohols in excess and Concentrated "sulphuric acid. is heated to a temp of 140°C. This process is known as "Continuous etherification".

$$2ROH \underset{140^\circ C}{\overset{\text{Conc. } H_2SO_4}{\rightleftharpoons}} R-O-R + H_2O$$

Examples

$$CH_3-CH_2-O-H + H-O-CH_2-CH_3 \underset{140^\circ C}{\overset{\text{Conc. } H_2SO_4}{\rightleftharpoons}} CH_3-CH_2-O-CH_2-CH_3 + H_2O$$

(2 moles of ethanol) (ethoxyethane)

$$2CH_3CH_2OH \underset{140^\circ C}{\overset{\text{Conc. } H_2SO_4}{\rightleftharpoons}} CH_3CH_2-O-CH_2CH_3 + H_2O$$

(2 moles of ethanol) Ethoxyethane water

- From Haloalkanes and dry Silver (I) oxide:

$$2RX + Ag_2O \xrightarrow{\text{warm}} R-O-R + 2AgX$$

R represents an alkyl group while X represents a halogen. The two atoms of the alkyl group displace the silver from its oxide to form an ether as seen above. The 2 atoms of the alkyl group attach themselves to both sides of the single oxygen atom thereby forming an ether.

4.) Uses of Ethylene Oxide

- It is used as an intermediate in the hydrolytic manufacture of ethylene glycol.
- Ethylene oxide is used in the preparation of non-ionic emulsifying agents, plastics and several Synthetic textiles.
- Used as a gaseous Sterilizing agent.