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ASSIGNMENT

Question 1

1) Give the IUPAC names of the following organic compounds
   1) CH_3OCH_3 - Methoxymethane
   2) $CH_3CH_2OCH_2CH_3$ - ~~Methoxyethane~~ Ethoxyethane
   3) $(CH_3CH_2CH_2CH_2)_2O$ - ~~Propoxypropane~~ Butoxymethane
   4) $CH_3CH_2OCH_3$ - Methoxyethane
   5) $CH_3CH_2CH_2OCH_2CH_3$ - Ethoxypropane

Discuss the properties of ethers

2) General properties

i) Physical states:

A) PHYSICAL STATES: Ethers are colourless, neutral liquids with pleasant odour at room temperature and lower aliphatic ethers are highly flammable gases or volatile liquids

B) 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 molecule are able to form hydrogen bonds with the water molecule, but as the hydrocarbon content of the molecule increases, there is rapid decline in solubility. They are miscible with organic solvents

C) Density: The density of ethers increase with increase in relative molecular mass. Most of the ethers are less dense than water and some of the aromatic ethers are also denser than water

D) Boiling point: The boiling point of ethers tend to approximate those of hydrocarbons of same relative molecular mass from which we can conclude that the molecules are not in the liquid phase. Lower molecules are not in mass ethers have lower boiling point than corresponding alcohols but those ethers containing alkyl radials, the reverse is true

E) Reactivity: Ethers are inert at moderate temperature, their inertness at moderate temperature leads to their wide use as reaction media

3. Discuss explicitly two methods of preparing ethers and show equations of reaction

1) PARTIAL DEHYDRATION OF ALCOHOLS.
Simple ethers are derived by analytic dehydration from alcohols. Concentrated tetraoxosulphate (VI) acid and excess alcohol are heated at a maintained temperature of 140°C

$$2CH_3CH_2OH \xrightleftharpoons{H_2SO_4\ 140^oC} CH_3CH_2-O-CH_2CH_3 + H_2O$$
ethanol ethoxyethane

2) FROM HALOALKANES AND DRY SILVER (I) OXIDE

$$2CH_3CH_2CH_2Cl + Ag_2O \xrightarrow{warm} CH_3CH_2CH_2OCH_2CH_2CH_3 + AgO$$

Halloalkanes including 1-chloropropane, 2 bromo ethane etc. are reacted with dried silver (I) oxide, both compounds are warmed to give an ether, and a corresponding silver halide

$$2RX + Ag_2O \xrightarrow{warm} R.O.R + 2AgY$$

eg $2CH_3CH_2CH_2Cl + Ag_2O \xrightarrow{warm} CH_3CH_2CH_2OCH_2CH_3CH_3 + 2AgCl$
1-Chloropropane Silver(I) oxide propoxypropane silver halide

4) State three uses of ethylene oxide
   1) It is used to produce ethanolamines
   2) It is used to produce acrylonitrile
   3) It is used as a health care ~~product~~ product.