Title: Chemistry Assignment

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Answers

1. a) CH3OCH3 - methoxymethane

 b) CH3CH2OCH2CH3 - ethoxyethane

 c) (CH3CH2CH2CH2)2O -butoxymethane

 d) CH3CH2OCH3 - methoxyethane

 e) CH3CH2CH2OCH2CH3 ­– ethoxypropane

2. Properties of ethers are as follows:

a) Physical states-At room temperature, ethers are colourless, neutral liquids with pleasant odours. The lower aliphatic ethers are highly flammable gases or volatile liquids.

b) 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 molecule 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.

c) 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

d) 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. 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 in the liquid phase as there are no suitably available hydrogen for association through hydrogen bonds,

3. Two methods of preparing ethers are as follows:

a) Controlled catalytic hydration of olefins

2CH3CH=CH2 + H2O (CH3)2CH-O-CH(CH3)2

2-isopropoxypropane

b) From Haloalkanes and dry silver (I) oxide

2RX + Ag2O warm R-O-R + 2AgX

Eg- 2CH3CH2CH2Cl + Ag2O warm CH3CH2CH2OCH2CH2CH3 + 2AgCl Propoxypropane

4. Three uses of ethylene oxide are as follows:

a) Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol

b) Ethylene oxide is used in the preparation of non-ionic emulsifying agents, plastics, plasticizers and several synthetic textiles

c) Ethylene oxide is used as a gaseous sterilizing agent.