ONYENEKE FRANCES CHINEMELUM

PHARMACY 19/MHS11/119

CHM 102 ASSIGNMENT

1a) CH3OCH3 = Methoxymethane

b) CH3CH2OCH2CH3 = Ethoxyethane

c) (CH3CH2CH2CH2)2O =Butoxymethane

d) CH3CH2OCH3 =Methoxyethane

e) CH3CH2CH2OCH2CH3 =Ethoxypropane

2a) Physical state; 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 fairy soluble in water since the molecule are able to form hydrogen bonds with the water molecules but as the hydrogen content of the molecule increases, there is a rapid decline in solubility. They are miscible with most organic solvent.

c) Density; Most of the simple ethers are less dense in 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 suitable available hydrogen for association through hydrogen bonds.

e) Reactivity; Ethers are inert at moderate temperature. Their inertness at moderate temperature leads to their wide use as reaction media.

3a) 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 1400C. This process is known as continuous etherification. If excess alcohol is not used, the temperature is as high as 170-1800C, further dehydration to yield alkene occurs.

2ROH conc.H2SO4/1400C R-O-R + H2O

Example; 2CH3CH2OH conc. H2SO4/1400C CH3CH2-O-CH2CH3 + H2O

b) From Haloalkanes and dry silver(i)oxide; This includes heating haloalkanes with dry silver(i)oxide.

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

Example; 2CH3CH2CH2Cl + Ag2O warm CH3CH2CH2OCH2CH2CH3 +2AgCl

(Propoxypropane)

4a) Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol.

b) Ethylene oxide is used in the preparation of nonionic emulsifying agents, plastics, plasticizers and several synthetic textiles.

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