

19/MHS01/111

Medicine and Surgery

1) Give the IUPAC names of the following organic compounds

 CH_3OCH_3 — Methoxy methane $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ — Ethoxyethane $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$ — Butoxymethane $\text{CH}_3\text{CH}_2\text{OCH}_3$ — Methoxyethane

2) Discuss the properties of ethers

a) Ethers are colourless, and neutral liquid with pleasant odour at room temperature. Lower aliphatic ethers are highly flammable gases or volatile liquids

b) Ethers are less soluble in water than in organic solvents. As the hydrocarbon content of the molecule increases, there is rapid decline in solubility, making lower molecular weight ethers such as methoxymethane fairly soluble in water, since it is able to form hydrogen bonds with water molecules

c) Simple ethers are less dense than water, but the density, increases with increasing relative molecular mass. And ~~some~~ ^{some} aromatic ethers are denser than water

d) The boiling point of ethers increases with increasing number of alkyl radicals. Ethers with alkyl radicals lesser than four carbons have low boiling point.

e) Ethers are inert at moderate temperatures, which leads to their wide use ~~as~~ as reaction media. They are not found commonly in nature.

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

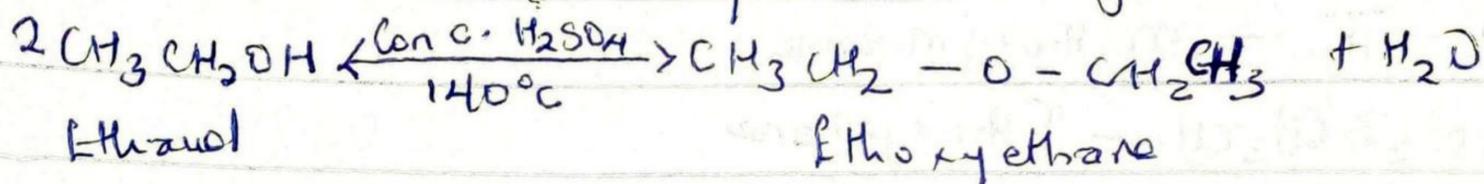
a) Partial dehydration of alcohols: Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol in excess are tetraoxosulphate (vi) acid is heated at a carefully maintained temperature of 140°C . This process is known as continuous etherification. Excess alcohol is needed, if not the temperature will be as high as

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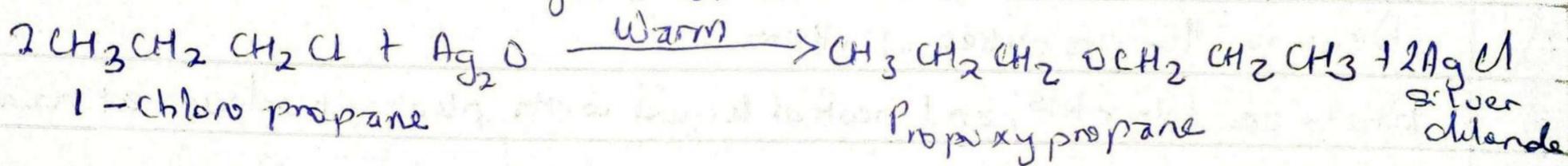
19/MH501/111

Medicine and Surgery

170°C - 180°C, and further dehydration will yield alkene



b) From Haloalkanes and dry silver (I) oxide: Haloalkanes is warmed with silver (I) oxide to yield an ether and silver halide



4) State three uses of ethylene oxide

i) It is used in the preparation of nonionic emulsifying agents, plastics, plasticizers and several synthetic textiles

ii) It is used as an intermediate in the hydrolytic manufacture of ethylene glycol

iii) It is used as a gaseous sterilizing agent