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Dept: Medicine and Surgery Matric No: 19/MHS01/177

CHM 102 ASSIGNMENT

1. Give the I.U.P.A.C. names of the following

(i) CH_3OCH_3 - Methoxymethane

(ii) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxyethane

(iii) $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$ - ~~Methoxy~~ Butoxymethane

(iv) $\text{CH}_3\text{CH}_2\text{OCH}_3$ - Methoxyethane

(v) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxypropane

2. Discuss the properties of ethers

(i) Physical states: At room temperature, ethers are colourless, neutral; sweet smelling liquids. The lower aliphatic ethers are either highly flammable gases or volatile liquids.

(ii) Solubility:

Ethers are less soluble in water than their corresponding alcohols and are miscible with most organic solvents.

Lower molecular weight ethers are fairly soluble in water, but as the hydrogen content hydrocarbon content of the molecule increases, its level of solubility declines.

(iii) Density: Most simple ethers are less dense than water, and some aromatic ethers are denser than water, although density increases with increasing ^{relative} molecular mass.

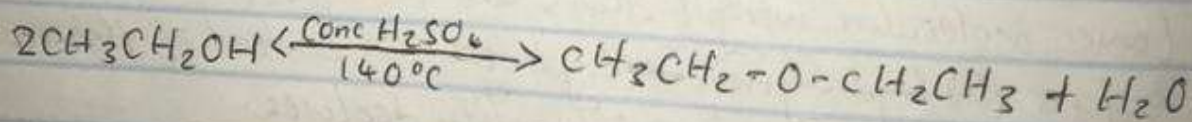
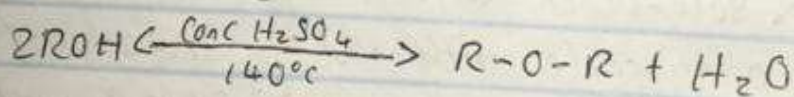
(iv) Boiling point: Low molecular mass ethers have a lower ^{for} boiling point than the corresponding alcohols. But ^{for} ethers containing alkyl radicals larger than four carbon atoms, reverse is the case.

(v) Reactivity: Ethers are unreactive at moderate temperatures which leads to their wide use as reaction media

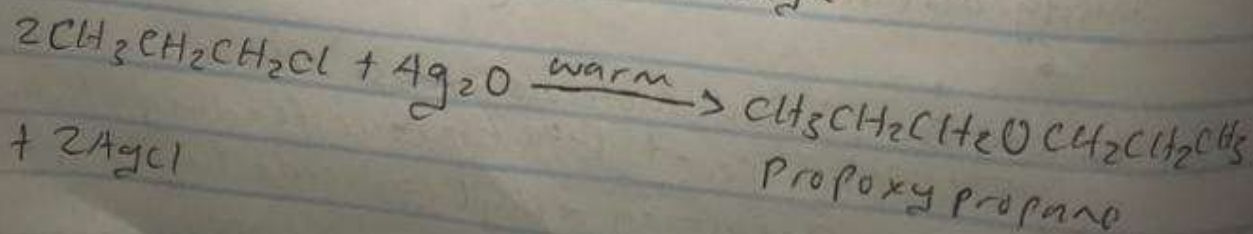
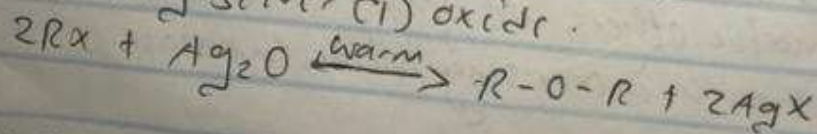
3. Discuss explicitly two methods of preparing ethers and show their equations of reaction

(i) Partial dehydration of alcohols:

Simple ethers are manufactured from alcohol by catalytic dehydration. Conc tetraoxosulphate(vi) acid is heated ^{with excess} alcohol in at a maintained temperature of 140°C , this is known as continuous etherification. If excess alcohol is not used, the temperature is as high as $170-180^{\circ}\text{C}$, further dehydration to yield alkene occurs



(ii) From Haloalkanes / alkyl halides and dry silver (I) oxide. Ethers can be prepared from by ^{heating} ~~warming~~ an alkyl halide with dry silver (I) oxide.



(4) State three uses of ethylene oxide?

(i) It is used as an intermediate in the hydrolytic manufacture of ethylene glycol.

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

(iii) It is used as a gaseous sterilizing agent.