

CHEMISTRY

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COURSE: CHEMISTRY 102 (ASSIGNMENT 2)

MATRIC: 191MHS01194

DEPT: MEDICINE AND SURGERY (MBBS)

(1)

1) Give the IUPAC names of the following organic compounds.

Answer

- a) CH_3OCH_3 - Methoxymethane
- b) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxyethane
- c) $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$ - Pentanediol
- d) $\text{CH}_3\text{CH}_2\text{OCH}_3$ - Methoxyethane
- e) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxypropane

(2)

2a) Discuss briefly the properties of ethers.

Answer

General & Chemical Properties

* PHYSICAL PROPERTIES

- o Physical States - At room temperature, ethers are colourless, neutral liquids with pleasant odours. The lower aliphatic ethers are highly flammable gases or volatile liquids.
- o 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 denser than water.

o Reactivity - Ethers are inert at moderate temperatures. Their inertness at moderate temperatures leads to their wide use as reaction media.

* CHEMICAL PROPERTIES

- o It doesn't react with bases, active metals, oxidizing agents and reducing agents.
- o Strong acids will cleave ethers at elevated temperatures.
- o When stored in presence of oxygen, ethers will form explosive peroxides such as diethyl ether peroxides.

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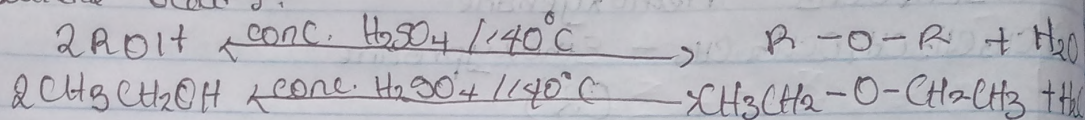
(3)

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

Solution

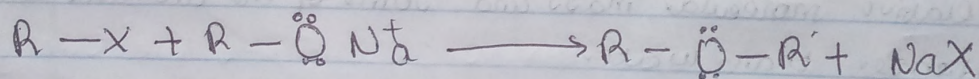
a) PARTIAL DEHYDRATION OF ALCOHOLS

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 140°C . This process 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.



b) PREPARATION OF ETHERS BY WILKINSON SYNTHESIS

In this method, an alkyl halide is reacted with sodium alkoxide which leads to the formation of ether. The reaction generally follows the $\text{S}_{\text{N}}2$ mechanism for primary alcohol.



Wilkenson Synthesis exhibits higher productivity in the case of primary alkyl halides. In the case of secondary alkyl halides, elimination competes with substitution whereas, we observe the formation of elimination products only in the case of tertiary alkyl halides.

(4)

- (4) State three uses of ethylene oxide

Answer:

- 1) Ethylene oxide is used to make antiseptics, adhesives etc.
- 2) It is used as fumigant in certain agricultural products and as a sterilant for medical equipment and supply.
- 3) Ethylene oxide is used as an intermediate in the production of other chemical used to manufacture product such as fabrics for clothing, upholstery, carpet and pillows.