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**DEPARTMENT: MBBS**

**MATRIC NUMBER: 19/MHS01/080**

**COURSE CODE: CHM 102**

1. Give the IUPAC names of the following organic compounds.
2. CH3OCH3

**ANSWER: METHOXYMETHANE**

1. CH3CH2OCH2CH3

**ANSWER: ETHOXYETHANE**

1. (CH3CH2CH2CH2)2O

**ANSWER:**

1. CH3CH2OCH3

**ANSWER: METHOXYETHANE**

1. CH3CH2CH2OCH2CH3

**ANSWER: ETHOXYPROPANE**

1. Discuss the properties of ethers.

**ANSWER**

1. **BOILING POINT.**

The boiling point of ethers is comparable to the alkanes but much lower than that of alcohols of comparable molecular mass despite the polarity of the C-O bond.

1. **PHYSICAL STATE.**

At room temperature, ethers are colorless, neutral liquids with pleasant odors. The lower aliphatic ethers are highly flammable gases or volatile liquids.

1. **DENSITY**

Most of the simple ethers are less dense than water, although the density increases with the increasing relative molecular mass and some of the aromatic ethers are in fact denser than water.

1. **REACTIVITY**

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

e. **SOLUBILITY**

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

**ANSWER**

**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

1400C. This process is known as **CONTINUOUS ETHERIFICATION.** If excess alcohol is not used,

the temperature is as high as 170-1800C, further occurs to yield alkene.

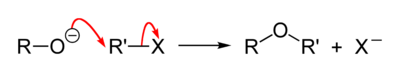
**E. G. conc. H2SO4/1400C**

**2CH3CH2CH2OH <------------------------------------> CH3CH2-O-CH2CH3 + H2O**

**b. FROM ALKYL HALIDES**

When alkyl halide reacts with sodium alkoxide, ether is formed. This reaction is known as **WILLIAMSON’S SYNTHESIS.** The reaction generally follows the **SN2** mechanism for primary alcohols.

The Williamson’s Synthesis is as follows;



An example is the reaction of sodium ethoxide with chloroethane to form diethyl ether and sodium chloride:

[Na]+[C2H5O]− + C2H5Cl → C2H5OC2H5 + [Na]+[Cl]−

4.) State three uses of ethylene oxide

**ANSWER**

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

**2.)** Ethylene oxide is used in the preparation of nonionic emulsifying agent, plastics, plasticizers and

Several synthetic textiles.

**3.)** Ethylene oxide is used as a gaseous sterilizing agent.