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**DEPARTMENT: NURSING**

**MATRIC NUMBER: 19/MHS02/015**

**COURSE CODE: CHM 102.**

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

CH3OCH3 = Methoxymethane

CH3CH2OCH2CH3 = Ethoxyethane

(CH3CH2CH2CH2 )2O =Butoxybutane

CH3CH2OCH3 =Methoxyethane

CH3CH2CH2OCH2CH3 = Ethoxypropane

1. **Discuss the properties of ethers.**
2. **Physical states**: At room temperature, ethers are colorless, neutral liquids with pleasant odor. The lower aliphatic ethers are highly flammable gases or volatile liquids.
3. **Solubility**: Ethers are less soluble in water than in corresponding alcohols. Lower molecular weight ethers such as methoxymethane and methoxyethane are fairly soluble in water since the molecules are able to form hydrogen bonds with the water molecules but as the hydrocarbon content of the molecules increases, there is a rapid decline in solubility. They are miscible with most organic solvents.
4. **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 in fact denser than water.
5. **Boiling point:** Low molecular mass ethers have a lower boiling point than the equivalent 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 suitably available hydrogen for association through hydrogen bonds.
6. **Reactivity:** Ethers are inert at moderate temperature. Their inertness at moderate temperatures leads to their wide use as reaction media.
7. **Discuss explicitly two methods of preparing ethers and show equations of reaction.**
8. **By 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℃. This process is known as continuous esterification. If excess alcohol is not used, the temperature is as high as 170℃ to 180℃, further dehydration to yield alkene occurs.

 2ROH conc. H2SO4 /140 ℃ R-O-R + H2O

Examples;

2CH3CH2OH conc. H2SO4 /140 ℃ CH3CH2 -O-CH2CH3 + H2O

1. **From halo alkanes and dry silver(I)oxide**

This includes Williamson’s synthesis and heating halo alkanes with dry silver oxide.

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

 Example;

 2CH3CH2CH2Cl + Ag2O warm CH3CH2CH2OCH2CH2CH3

1. **State three uses of ethylene oxide.**
2. Ethylene oxide is a surface disinfectant that is widely used in hospitals and the medical equipment industryto replace steam in the sterilization of heat sensitive tools andequipment, such as disposable plastic syringes.
3. It is used mainly as a chemical intermediate in the manufacture of ethylene glycol (antifreeze).
4. It is used in the preparation of nonionic emulsifying agents, plastics, detergent and several synthetic textiles.