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**COURSE:CHM 102.**

**QUESTION 1:**

1. CH3OCH3- Methoxymethane.
2. CH3CH2OCH2CH3- Ethoxyethane.
3. (CH3CH2CH2CH2)2O- Butoxybutane.
4. CH3CH2OCH3- Methoxyethane.
5. CH3CH2CH2OCH2CH3- Ethoxypropane.

**QUESTION 2:**

Properties of Ethers:

1. Physical states: At room temperature, ethers are colourless, neutral liquids with pleasant odours. The lower aliphatic ethers are highly flammable gases or volatile liquids.
2. Solubility: Ethers are less soluble in water than the corresponding alcohols. Lower molecular weight ethers such as methoxyethane and methoxy methane are faily soluble in water because if their ability to form hydrogen bonds with the water molecules. As the hydrocarbon content of the molecules increases, Solubility decreases.
3. Boiling point: Lower molecular mass ethers have a lower boiling point than the corresponding alcohols but the ethers with alkyl radicals larger than 4 carbon atoms, the reverse is true.
4. Density: Most simple ethers are less dense than water, although the density increases with increasing relative molecular mass. Some of the aromatic ethers are denser than water.
5. Reactivity: Ethers are inert at moderate temperature. This causes their wide use as reaction media. Simple ethers are not commonly found in nature but the ether linkage is present in natural products such as starch, cellulose and sugar.

**QUESTION 3:**

1. 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 careful maintained temperature of 140°C. This process is known as continuous estherification. If excess alcohol is not used, the temperature will be raised as high as 170-180°C. Further dehydration will yield alcohols.

Example:

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

1. From Haloalkanes and dry silver(I) oxide: Haloalkanes and dry silver(I) oxide undergo a warm reaction to give rise to ethers.

Example:

2CH3CH2CH2Cl + Ag2O warm CH3CH2CH2OCH2CH2CH3 + 2AgCl

Propoxypropane

**QUESTION 4:**

Uses of ethylene oxide:

1. It is used as a gaseous sterilizing agent.
2. It is used in the preparation of nonionic emulsifying agents, plastics, plasticizers and several synthetic textiles.
3. It is used as an intermediate in the hydrolytic manufacture of ethylene glycol.