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**MATRIC NO: 19/MH01/390**

**CHM 102 ASSIGNMENT**

**1. IUPAC NAMES OF ORGANIC COMPOUNDS.**

CH 3 OCH 3 – Methoxymethane

CH 3 CH 2 OCH 2 CH 3 – Ethoxyethane

(CH 3 CH 2 CH 2 CH 2 ) 2 O– Butoxymethane

CH 3 CH 2 CH 2 OCH 2 CH 3 – Ethoxypropane

2. **PROPERTIES OF ETHERS**

i) **Physical states** : at room temperature, ethers are colorless, neutral

liquids with pleasant odors. The lower aliphatic ethers are highly

flammable gases or volatile liquids.

ii) **Solubility** : ethers are less soluble in water than are the

corresponding alcohols. Lower molecular weight ethers such as

methoxyethane are fairly soluble in water since the molecule are

able to form hydrogen bonds with the water molecules but as the

hydrocarbon content of the molecules increases, there is a fast

decline in solubility. They are miscible with most organic solvents.

iii) **Reactivity** : ethers are inert at moderate temperature. Their inertness

at moderate temperatures leads to their wide use as reaction media.

iv) **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.

v) **Boiling point** : low molecular mass ethers have a lower boiling point

than the corresponding alcohols but those ethers containing alkyl

radicals larger than four carbon atoms, the reverse is the case. The

boiling point of ethers tends to be almost the same with those of

hydrocarbons of some 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.

3. **PREPARATION OF ETHERS.**

**i) 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 0 c. this process is known as

continuous etherification. If excess alcohol is not used, the

temperature is as high as 170-180 0 c. further dehydration to yield

alkene occurs.

**Equation for the reaction:**

2ROH conc. H 2 SO 4 /140 0 c R-O-R + H 2 O

Example

2CH 3 CH 2 OH conc. H 2 SO 4 /140 0 c CH 3 CH 2 -O-CH 2 CH 3 + H 2 O

**ii) From haloalkanes and dry silver (I) oxide**

Equation for the reaction:

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

Example:

2CH 3 CH 2 CH 2 Cl + Ag 2 O warm CH 3 CH 2 CH 2 OCH 2 CH 2 CH 3 + 2AgCl

Propoxypropane

4. **Uses of ethylene oxide**

i. Ethylene oxide is used as an intermediate in the hydrolytic

manufacture of ethylene glycol

ii. Ethylene oxide is used in the preparation of nonionic emulsifying

agents, plastics, plasticizers and several synthetic textiles

iii. Ethylene oxide is used as a gaseous sterilizing agent