

NAME: VICTORY - OPJVA FUTURE SAHOO  
DEPT: MEDICINE AND SURGERY  
MATRIC NO: 19/MH001/438  
COURSE CODE: CHM 104

### ASSIGNMENT ON ETHERS

1. IUPAC names of the following:
  - a)  $\text{CH}_3\text{OCH}_3$  - methoxymethane
  - b)  $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$  - Ethoxyethane
  - c)  $(\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$  - Butoxyethane
  - 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. Properties of ethers.
  - (A) General properties:
    - a) Physical states: At room temperature, ethers are colourless, neutral liquids with pleasant odours. The lower aliphatic ethers are highly flammable gases or volatile liquids.
    - b) Solubility: Ethers are less soluble in water than 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 increase, there is a rapid decline in solubility. They are miscible with most organic solvents.
    - c) 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.
    - d) 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 true.

a.) Reasoning: Ethers are inert at moderate temperature. Their inertness at moderate temperatures leads to their wide use as reaction media.

3. Manufacture and preparation of ethers.

a.) Partial dehydration of alcohols:

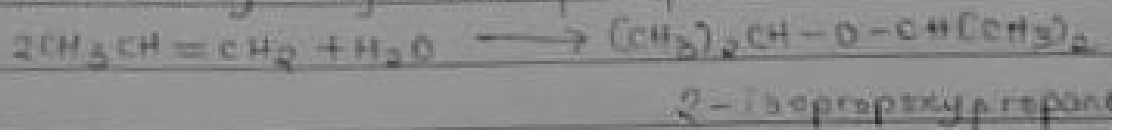
Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol is excess and concentrated tetraoxosulphate(VI) acid is heated at a carefully maintained temperature of  $140^{\circ}\text{C}$ . This process is known as controlled partial dehydration. If excess alcohol is not used, the temperature goes high as  $170-180^{\circ}\text{C}$ , further dehydration to yield oxides occurs.



Examples:



2. Controlled catalytic hydration of alkenes:



4.) Uses of ethylene oxide include:

i.) Ethylene oxide is used as a gaseous sterilizing agent.

ii.) Ethylene oxide is used in the preparation of nonionic emulsifying agents, plastics, plasticizers and several synthetic textiles.

iii.) Ethylene oxide is used as an intermediate in the hydrolysis of ethylene glycol.