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MATRIC NO: 19/MTH/01/365.
COLLEGE: MTHS.
COURSE: CHEM 102.
DATE: 26/04/2020.
ASSIGNMENT

IUPAC names of the following compounds:

- i) CH_3OCH_3 - Methoxymethane.
- ii) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxyethane.
- iii) $(\text{C}_4\text{H}_9\text{O})_2\text{O}$ - Butoxymethane.
- iv) $\text{CH}_3\text{CH}_2\text{OCH}_3$ - Methoxyethane.
- v) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxypropane.

2) Properties of ethers:

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 are the 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, rapid decline in solubility follows; they are miscible with most organic solvents.

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.

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.

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

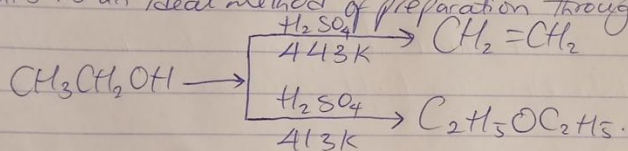
2) Methods of preparing ethers.

- Preparation of Ethers by Dehydration of Alcohols.

In the presence of protic acids (Sulphuric acid), alcohols undergo dehydration to produce alkenes and ethers under different conditions.

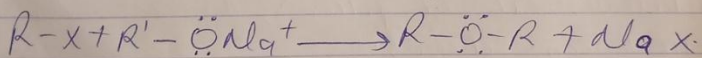
For example: In the presence of Sulphuric acid, dehydration of ethanol at 443K yields ethene whereas it yields ethoxymethane at 413K. The preparation of ethers by dehydration of alcohol is a nucleophilic substitution reaction.

This is an ideal method of preparation through primary alcohols.



- Preparation of Ethers by Williamson Synthesis.

Williamson synthesis in this method, an alkyl halide is reacted with sodium alkoxide which leads to the formation of ether. The reaction generally follows the $\text{S}_{\text{N}}2$ mechanism for primary alcohol.



4) Uses of ethylene oxide:

- i) They are used as intermediate in the hydrolytic manufacture of ethylene glycol.
- ii) They are used in the preparation of nonionic emulsifying agents, plastics, plasticizers and several synthetic textiles.
- iii) They are used as a gaseous sterilizing agent.