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COURSE: CHM102

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1) Give the IUPAC name of the following organic compounds.

A)  $\text{CH}_3\text{OCH}_3$  – Methoxymethane

B)  $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$  – Ethoxyethane

C)  $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$ . – Butoxymethane

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) Discuss the properties of ethers

a) Physical properties-

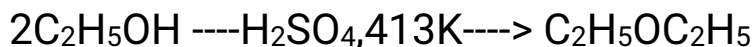
- An ether molecule has a net dipole moment due to the polarity of C-O bonds.
- The boiling point of ethers is comparable to the alkanes but much lower than that of alcohols of comparable molecular mass despite the polarity of the C-O bonds.
- Ethers are miscible in water i.e the oxygen atom of ether can also form hydrogen bonds with a water molecule.

b) Chemical properties-

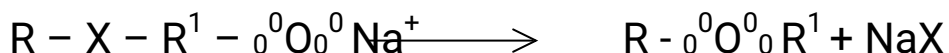
- Halogenations of ethers- Aromatic ethers undergo hydrogenation. E.g. bromination.
- Friedel Craft's Reaction of Ethers- Aromatic ethers undergo Friedel-Craft's reaction i.e. addition of alkyl group upon the reaction with alkyl halide in the presence of a Lewis acid as catalyst.

3) Discuss explicitly two methods of preparing ethers and show equation of reaction

- a) Dehydration of alcohols – In the presence of sulphuric acid, dehydration of ethanol yields ethoxyethane at 413K. This is an ideal method of preparation through primary alcohols.



- b) Williamson's synthesis – When an alkyl halide reacts with sodium alkoxide, ether is formed.



4) Uses of ethylene Oxide

- a) It is used as an intermediate in the hydrolytic manufacture of ethylene glycol.
- b) It is used as a gaseous sterilizing agent.

c) It is used in preparation of non-ionic emulsifying agents, plastics, plasticizers and several synthetic textiles.