

chem 102 Ethers

Assignment -

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Q1 Give the IUPAC names of the following Organic compounds.

- CH_3OCH_3 - Methoxymethane.

- $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxyethane

- $(\text{C}_2\text{H}_5\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$ - Butoxyethane.

- $\text{CH}_3\text{CH}_2\text{OCH}_3$ - Methoxyethane.

- $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxypropane.

Q2 Discuss the properties of ethers.

1) 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 denser than water.

2) Physical states: At room temperature, ethers are colourless, neutral liquids with pleasant odours. The lower aliphatic ethers are highly flammable gases or volatile liquids.

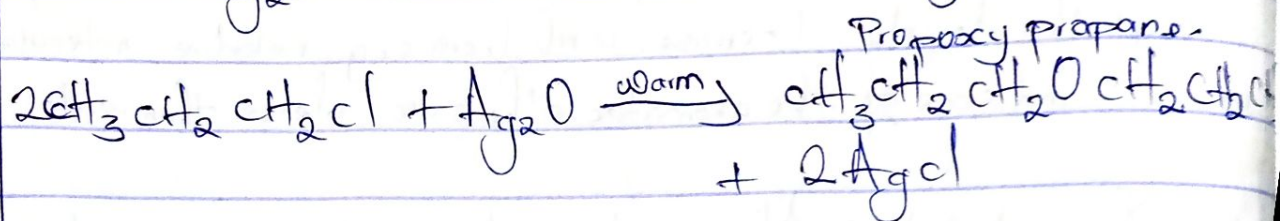
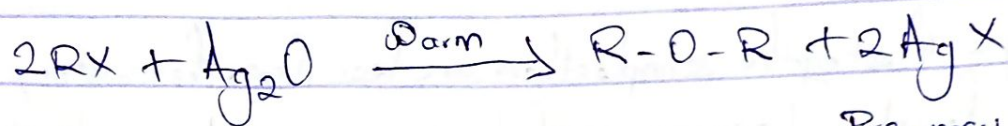
3) Reactivity: Ethers are inert at moderate temperature. Their inertness at moderate temperature leads to their wide use as a reaction medium.

(ii) Boiling point: lower mass ethers have lower boiling point than the corresponding alcohols but those ethers containing alkyl radicals larger than four carbon atoms, the reverse is true. The boiling point of ethers is to approximate those of hydrocarbon of same relative molecular mass from which it can be concluded that the molecules are not associated in the liquid state.

(iii) Solubility: Ethers are less soluble in water than are the corresponding alcohols, lower molecular weight ethers such as methoxyethane and methoxymethane are fairly soluble in water since the molecules are able to form hydrogen bonds with the water molecules but as the ~~carbon content~~ hydrocarbon content of the molecule increases, there is rapid decline in solubility. They are miscible with most organic solvents.

(3) Discuss explicitly two methods of preparing ethers and show equations of reactions.

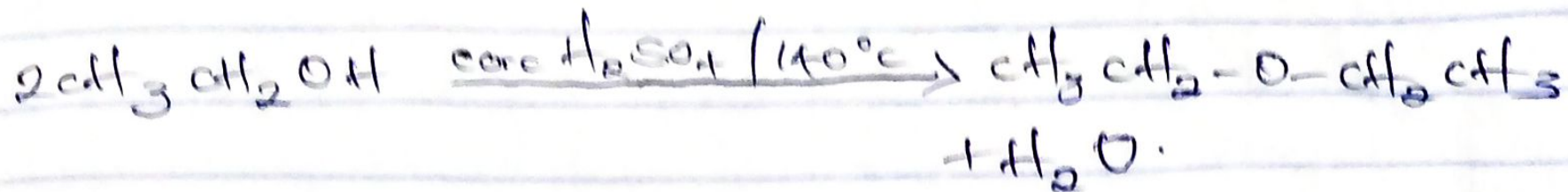
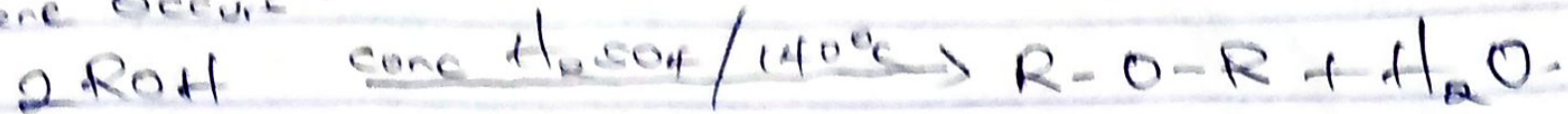
(i) From Haloalkanes and dry silver(I) oxide.



(ii) 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°C . This process is known as continuous

etherification. If excess alcohol is not used, the temperature is as high as $170-180^{\circ}\text{C}$, further by dehydration to yield alkene occurs.



Q. State three uses of ethylene acid.

- (i) Ethylene acid is used as a gaseous sterilizing agent.
- (ii) Ethylene acid is used in the preparation of non-ionic emulsifying agents, plastics, plasticizers and several synthetic textiles.
- (iii) Ethylene acid is used as an intermediate in the hydrolytic manufacture of ethylene glycol.