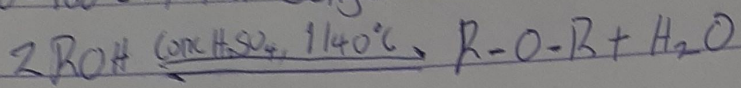
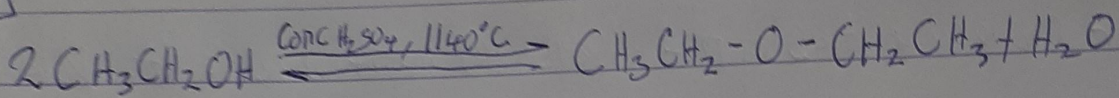


b) Partial dehydration of alcohols

Simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol in excess and concentrated tetraoxosulphate (VI) acid is heated at a carefully maintained pressure of 140°C this process is known as continuous esterification of excess alcohol is not used, the temperature is as high as $170-180^{\circ}\text{C}$. Further dehydration to alkene occurs.



e.g



4) a) It is used as an intermediate in the hydrolytic manufacture of ethylene glycol.

b) It is used in the preparation of ~~anionic~~ anionic emulsifying agents, plastic, plasticizers and several synthetic textiles.

c) Ethylene Oxide is used as a gaseous sterilizing agent.

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(Ethers)

Assignment answers

- 1 a) CH_3OCH_3 : Methoxymethane
- b) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$: Ethoxyethane
- c) $(\text{C}_2\text{H}_5)_2\text{O}$: Diethyl ether
- 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) A) Physical Properties

i) An ether molecule has a net dipole moment due to the polarity of C-O bonds.

ii) The boiling point of ether is comparable to the alkanes but much lower than that of alcohols of comparable molecular mass despite the polarity of the C-O bonds.

iii) Ether molecules are miscible in water. This is attributed to the fact that like alcohol, the oxygen atom of ether can also form hydrogen bonds with a water molecule.

B) Chemical Properties

i) Doesn't react with bases, active metals, oxidizing agents and reducing agents.

ii) Strong acids will cleave ethers at elevated temperatures

iii) When stored in the presence of oxygen, ethers will form explosive peroxides such as diethyl ether peroxide.

3) a) Controlled Catalytic hydration of Olefins

Controlled hydration of olefins with a catalyst can lead to the production of ethers. If this is not controlled it can lead to the production of an alcohol instead of an ether

