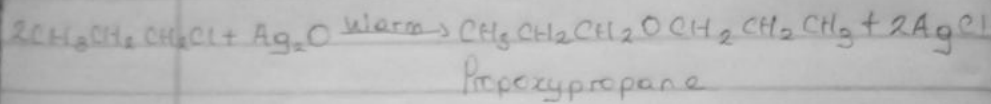
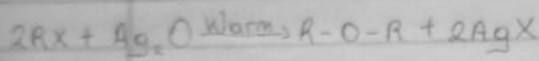


(4)

19/MH901/286

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



(4) State three uses of ethylene oxide

Answers

a) Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol

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

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

(5) Chemis

A) Cleav

i) Heat

catalyst

CH<sub>3</sub>CH

ii) Ethers an

acids su

CH<sub>3</sub>CH<sub>2</sub>

B) Autoc

In the

tion to

the dang

CH<sub>3</sub>CH<sub>2</sub>CC

(5) Disous

shon equ

Answers

i) Controlle

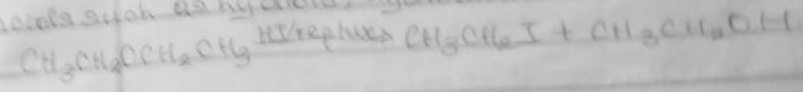
2CH<sub>3</sub>CC

Chemical properties

A) Cleavage

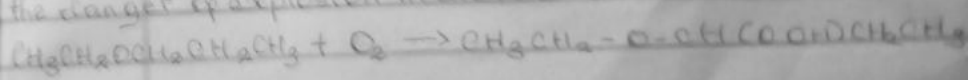
Heat decomposes ethers especially in the presence of alumina catalysts to form olefins and water as physical products.  
 $CH_3CH_2-O-CH_3 \xrightarrow{Al_2O_3/heat} CH_3CH=CH_2 + H_2O$

Ethers undergo carbon-oxygen fission on heating with strong acids such as hydroiodic, hydrobromic and nitric acids.



B) Autoxidation

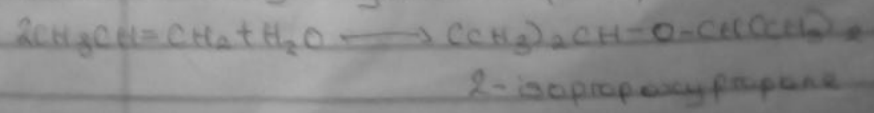
In the presence of oxygen, ethers undergo self oxidation to unstable peroxides and this reaction may create the danger of explosion in stored ether.



Discuss explicitly 2 methods of preparing ethers and show equation of reaction

Answers

Controlled catalytic hydration of olefins



Matric No: 19/14430V24

19/14430V24

Lower molecular weight ethers such as methoxy methane and methoxy ethane are partly soluble in water since the molecules are able to form hydrogen bonds with the water molecules but as the hydrogen content of the molecules increases, there is rapid decline in solubility.

iii) Density:

Most of the simple ethers are less dense than water, although the density increases with increasing relative molecular mass.

iv) 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.

v) Reactivity:

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

①

Matric No: 19/1430/200

NAME: 103110 DAVID CHIZI NAOMI  
COURSE TITLE: GENERAL CHEMISTRY II  
COURSE CODE: CHM 102

### Assignment

(1) Give the IUPAC names of the following organic compounds

- $\text{CH}_3\text{OCH}_3$  - Methoxymethane
- $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$  - Ethoxyethane
- $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$  - Dodecane
- $\text{CH}_3\text{CH}_2\text{OCH}_3$  - Methoxyethane
- $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$  - Ethoxypropane

(2) Discuss the properties of ethers

### Answers

(i) Physical states

At room temperature, ethers are colourless, neutral liquids with pleasant odours.

The lower aliphatic ethers are highly flammable gases or volatile liquids.

### (ii) Solubility

Ethers are less soluble in water than are the corresponding alcohols.