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COURSE CODE: CHEM102

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ETHERS

1) Give them IUPAC names of the following organic compounds

- a) CH_3OCH_3 b) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ c) $\text{CH}_3(\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$

Answer

<u>Organic Compounds</u>	<u>IUPAC names</u>
a) CH_3OCH_3	Methoxymethane
b) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$	Ethoxyethane
c) $\text{C}(\text{CH}_3\text{CH}_2\text{CH}_2)_2\text{O}$	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) Property of ethers

i) Physical States: At room temperature, ethers are colorless, neutral liquids with pleasant odors

ii) Solubility: Ethers are less soluble in water than corresponding alcohols. Lower molecular weight ethers such as methoxyethane and methoxymethane are fairly soluble in water since they are able to form hydrogen bonds in water

iii) 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.

iv) Reactivity

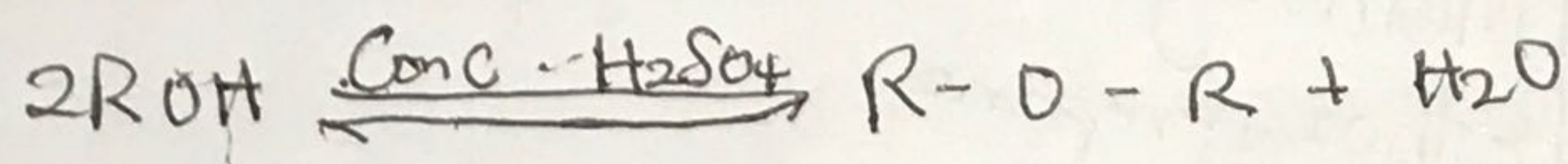
Ethers are inert at moderate temperature. Their inertness at moderate temperature leads to their

reaction media.

3) Discuss explicitly of methods of preparing ethers and show equations of reaction.

1) ~~AN~~ PARTIAL DEHYDRATION OF ALCOHOLS

Simple ethers are manufactured from alcohols by catalytic dehydrations. The alcohol in excess and concentrated H_2SO_4 is heated and carefully maintained temperature of $140^\circ C$. The process is ~~known~~ known as "continuous esterification". If excess alcohol is not used, the temperature is as high as $170-180^\circ C$, further dehydration to yield alkene occurs.



2) FROM HALOALKANES AND DRY SILVER (I) OXIDE
General formula for ethers $\Rightarrow R-O-R$, $R-O-Ar$, $Ar-O-Ar$,
where

$R \Rightarrow$ Alkyl group and $Ar \Rightarrow$ Aryl group.

4) state 3 uses of ethyl oxide
USES OF ETHYLENE OXIDE

1) Ethylene oxide is used as an intermediate in hydrolytic manufacture of ethylene glycol.

2) Ethylene oxide is a gaseous sterilizing agent.

3) Ethylene oxide is used in preparation of non-ionic emulsifying agents, plastics, and several synthetic agents.