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Geology

CHM 102 Assignment

- ① $\text{C} \text{H}_3 \text{O} \text{C} \text{H}_3 \longrightarrow$ methoxymethane
 $\text{C} \text{H}_3 \text{C} \text{H}_2 \text{O} \text{C} \text{H}_2 \text{C} \text{H}_3 \longrightarrow$ Ethoxyethane
 $(\text{C} \text{H}_3 \text{C} \text{H}_2 \text{C} \text{H}_2 \text{C} \text{H}_2)_2 \text{O} \longrightarrow$ Butoxyethane
 $\text{C} \text{H}_3 \text{C} \text{H}_2 \text{O} \text{C} \text{H}_3 \longrightarrow$ Methoxyethane
 $\text{C} \text{H}_3 \text{C} \text{H}_2 \text{C} \text{H}_2 \text{O} \text{C} \text{H}_2 \text{C} \text{H}_3 \longrightarrow$ Ethoxypropane

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

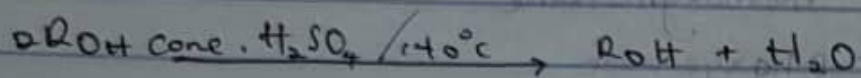
II. Density: Most of the simple ethers are less dense than water although the density increases with increasing molecular mass and some of the aromatic are in fact denser than water.

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

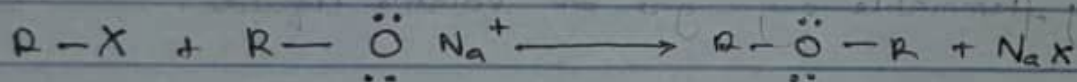
V. Boiling point: Low molecular mass ethers have a lower boiling point than the corresponding alcohols but those ether containing alkyl radicals larger than four carbon atoms, the reverse is true.

VI. Solubility: Ethers are less soluble in water than are the corresponding alcohols. Lower molecule ethers are fairly 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 a rapid decline in solubility.

③ 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 at 140°C . This is known as the continuous etherification.



II. Williamson Synthesis: It is an important method of the preparation of symmetrical and asymmetrical ethers in laboratories. An alkyl halide is heated with sodium alkoxide which leads to the formation of ether. It generally follows $\text{S}_\text{N}2$ mechanism for primary alcohols.



As we know alkoxides are strong bases and they can react with alkyl halides leading to elimination reactions. Williamson synthesis exhibits higher productivity in the case of primary alkyl halides.

(A) I Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol.

II Ethylene oxide is used in the preparation of non ionic emulsifying agents, plastics, plasticizers and several synthetic textiles.

III Ethylene oxide is used as a gaseous sterilizing agent.