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ASSIGNMENT.

1. The IUPAC names are:
   i. CH_3OCH_3 - Methoxymethane.
   ii. $CH_3CH_2OCH_2CH_3$ - Ethoxyethane.
   iii. $(CH_3CH_2CH_2CH_2)_2O$ – Butoxybutane.
   iv. $CH_3CH_2OCH_3$ - Methoxyethane.
   v. $CH_3CH_2CH_2OCH_2CH_3$ - Ethoxypropane.

2. The properties of ethers are:
   i. An ether molecule has a net dipole moment due to the polarity of C-O bonds.
   ii. Boiling point: The boiling point of ethers is comparable to the alkanes but much lower than that of alcohols of comparable molecular mass despite the polarity of the C-O bond. The miscibility of ethers with water resembles that of alcohols.
   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.
   iv. They are colourless, neutral liquids with a pleasant odour.
   v. They are inert at moderate temperature which leads to their wide use as reactive media.
   vi. They are not found commonly in nature but have linkages present in cellulose, starch and glucose.
   vii. Their density increases with the relative molecular mass. As thus, simple ethers are less dense than water.
3. Two methods of preparing ethers:
   i. <u>Controlled catalytic hydration of olefins(alkenes):</u>

   $2CH_3CH_2{=}CH_3 + H20 \longrightarrow (CH_3)_2CH\text{-}O\text{-}CH\ (CH_3)_2$

   (PROPENE) (2-isopropoxypropane)

   ii. <u>Partial/ Catalytic dehydration of alcohols:</u>

Using H2SO4 as the catalyst, alcohols react with water (H20) under a temperature of 140℃ (if the alcohol used is in excess) to produce ethers. But, if the alcohol used is not in excess, a temperature range from 170℃ -180℃

$CH_3CH_2OH \xrightarrow{CONC.H_2SO_4/140℃} CH3CH2OCH3CH2 + H2O$

4. Some of the uses of ethylene oxide are:
   i. Used as a gaseous sterilizing agent.
   ii. Used in the production or preparation of emulsifying agents.
   iii. Used as an intermediate in the hydrolytic manufacturing of ethylene glycol.