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Human Anatomy  
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Chemistry Assignment

1.  $\text{CH}_3\text{OCH}_3$  - methoxymethane  
 $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$  - ethoxyethane  
 $\text{C}(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3)_2\text{O}$  - butoxyethane  
 $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$  - methoxyethane  
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$  - ethoxypropane

## 2 properties of ethers

- \* Physical state: At room temperature ethers are colourless, neutral liquids with pleasant odours. They are highly flammable gases or volatile liquids.
- \* Solubility: Ethers are less soluble in water than are the corresponding alcohols. Lower molecular weight ethers such as methoxymethane and methoxyethane are fairly soluble in water since the molecules are able to form hydrogen bonds with the water molecules but as the hydrocarbon content of the molecules increases there is a rapid decline in solubility. They are miscible with most organic solvents.
- \* Density: Most of the simple ethers are less dense than water, although the density increases with the increasing relative molecular mass and some of the aromatic ethers are in fact denser than water.
- \* 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. The boiling points of ethers tend to approximate those of hydrocarbons of same relative molecular mass. From which it can be concluded that the molecules are not associated in the liquid phase as there are no suitably available hydrogen for association through hydrogen bond.

\* **Reactivity:** Ethers are inert at moderate temperatures. Their inertness at moderate temperatures leads to their wide use as reaction media.

3. **Controlled catalytic hydration of olefins**  
 $2\text{CH}_3\text{CH}=\text{CH}_2 + \text{H}_2\text{O} \rightarrow (\text{CH}_3)_2\text{CH}-\text{O}-\text{CH}(\text{CH}_3)$   
 2 - Isopropoxypropane

From haloalkanes and dry silver (I) oxide  
 $2\text{RX} + \text{Ag}_2\text{O} \xrightarrow{\text{warm}} \text{R}-\text{O}-\text{R} + 2\text{AgX}$

$2\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl} + \text{Ag}_2\text{O} \xrightarrow{\text{warm}} \text{CH}_3\text{CH}_2\text{CH}_2\text{O}$   
 Propoxypropane  
 $\text{CH}_2\text{CH}_2\text{CH}_3 + 2\text{AgCl}$

4. **Uses of ethylene oxide**

- It is used as a gaseous sterilizing agent
- It is used as intermediate in hydrolytic manufacture of ethylene glycol
- It is used in the preparation of nonionic emulsifying agents, plastics, plasticizers and several synthetic textiles