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Course: CHM 102

Dept.: MBBS

Assignment 2 Solutions

1. (a) CH3OCH3-Methoxymethane

(b) CH3CH2OCH2CH3-Ethoxyethane

(c) (CH3CH2CH2CH2)2O-Butoxybuthane

(d) CH3CH2 OCH3-Methoxyethane

(e) CH3CH2CH2OCH2CH3-Ethoxypropane

1. The properties of ethers include;
2. Physical states: At room temperature, ethers are colorless, neutral liquids with pleasant odours. The lower aliphatic ethers are highly flammable gases or volatile liquids.
3. Solubility: Ethers are less soluble in water than are the corresponding alcohols.
4. Density: Their density increases with increasing relative molecular mass.
5. 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.
6. Reactivity: Ethers are inert at moderate temperature.
7. Methods of preparing ethers
8. Partial dehydration of alcohol:

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 of 1400c.

2ROH conc. H2SO4 /140oC R-O-R + H2O

Examples

2CH3CH2OH conc. H2SO4 /140oC CH3CH2-O-CH2CH3 + H2O

1. Controlled catalytic hydration of olefins

2CH3CH=CH2 + H2O (CH3)2CH-O-CH(CH3)2

 2-isopropoxypropane

1. (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