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MECHATRONICS ENGINEERING

CHM 102

ASSIGNMENT

1]. IUPAC NAMES OF ORGANIC COMPOUNDS

CH­3OCH2-Methoxymethane

CH3CH2OCH2CH3- Ethoxyethane

(CH3CH2CH2CH2)2O- Butoxymethane

CH3CH2CH2OCH2CH3- Ethoxypropane

2]. PROPERTIES OF ETHERS

A). Miscibility: The ether molecules are miscible in water. This is attributed to the fact that like alcohol, the oxygen atom of ether can also form hydrogen bond with a water molecule.

B). Solubility: Other corresponding alcohols are more soluble in water than ethers, ethers with lower molecular weight are fairly soluble in water but as the hydrocarbon content of the molecules increase, there is a fast reduction in solubility. They are miscible with most organic solvents

c). Reactivity; Ethers are inert at room temperatures. This inertness at room temperatures leads to their wide use as reaction media

d). Density; Most of the simple ethers are less dense than water although the density increases with increasing RMM and some of the aromatic ethers are in fact denser than water

e). An ether has a net dipole moment due to the polarity of C-O bonds.

f). Boiling Point: The boiling point of ethers is comparable to that of alkanes but much more lower than that of alcohols of comparable molar mass despite the polarity of the C-O bonds.

3] PREPARATION OF ETHERS

a). Partial dehydration of alcohols; Simple ethers are manufactured from alcohol through catalytic dehydration. The alcohol in excess and conc. H2SO4 is heated at a carefully maintained temperature of 140\*, this process is known as continuous etherification. If excess alcohol is not used the temperature can be high as 170 – 180\*, further dehydration will yield alkenes

2ROH---------------------------->R-O-R + H2O

E. g 2CH­3CH2CH2OH------------------>CH3CH2CH2-O- CH3CH2CH2 + H2O

b). From haloalkanes and dry silver(I) oxide

2RX + Ag2O---------->R-O-R + H2O

Warm

2CH3CH2Br + Ag2O---------> CH3CH2OCH2CH3 + 2AgBr

4]. USES OF ETHYLENE OXIDE

A) Ethylene oxide is used as a sterilizing agent for medical supplies.

B) It’s used in making anti-freeze, adhesives, e.t.c.

C) It is also used in the preparation of nonionic emulsifying agents, plastics, plasticizers and several synthetic textiles.

D) Other derivatives made from ethylene oxide are used as ingredients for household and industrial cleaners, cosmetics, e.t.c.