NAME — Jimoh [illegible] [illegible] Registration number — 19 [illegible]

COURSE — CHM 102
DEPARTMENT — PHARMACY

ASSIGNMENT

1) Give the IUPAC names of the following organic compounds

a) CH_3OCH_3 — Methoxymethane

b) $CH_3CH_2OCH_2CH_3$ — Ethoxyethane

c) $(CH_3CH_2CH_2)_2O$ — Butoxymethane.

d) $CH_3CH_2OCH_3$ — methoxyethane

e) $CH_3CH_2CH_2CH_3$ — Ethoxy propane.

2) Discuss the properties of ethers

There are physical and chemical properties of ethers

a) Physical properties

* An ether molecule has a net dipole moment due to the polarity of C–O bonds

* 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 those of alcohol.

* 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 [illegible] molecule.

b) Chemical properties

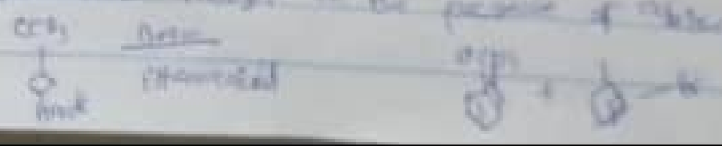
i) Cleavage of C–O bond

Ethers are generally very unreactive in nature. When an excess of hydrogen halide is added to the ether, cleavage of C–O bond takes place leading to the formation of alkyl halide. The order of reactivity is given as [illegible]

HX, R — O — R + HX → RX + R — OH

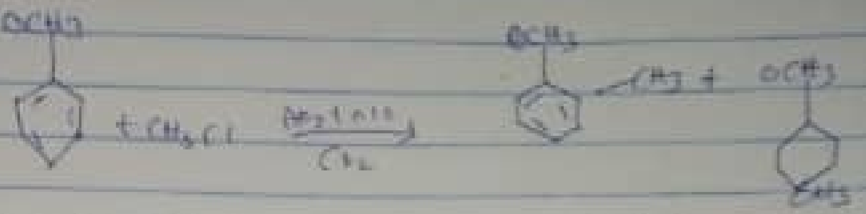
* Halogenation of ethers: Aromatic ethers undergo halogenation for example bromination, [illegible] [illegible] halogen in the presence of [illegible]

Example



* Friedel Craft Reaction of ethers

Aromatic ethers undergo friedel crafts reaction for example addition of alkyl or acyl group upon the reaction with alkyl or acyl halide in the presence of a Lewis acid as catalyst.



7) Discuss explaining the methods of preparing ethers and show equations of reaction.

a) 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 monitored temperature of 140°C. This process is known as continuous etherification. If excess alcohols is not used the temperature is as high as 160 – 180°C. Further dehydration of yield alkene occurs $2ROH \longrightarrow R-O-R + H_2O$

Examples

$2CH_3CH_2OH \rightleftharpoons CH_3CH_2-O-CH_2CH_3 + H_2O$

b) Continued catalytic hydration of ethers

$2CH_3CH = CH_2 + H_2O \longrightarrow (CH_3)_2CH-O-CH(CH_3)_2$

2 – isopropoxypropane

a) State three uses of ethylene oxide

a) Ethylene oxide is used as an intermediate in the industrial manufacture of ethylene glycol.

b) Ethylene oxide is used in the preparation of ceramic emulsifying agents, plastics, plasticizers and several synthetic textiles.

c) Ethylene oxide is used as a gaseous sterilizing agent.