

Ethers

Chemistry 102 Assignment 15/04/20

Name: Victor-Ohi Chigwe Noble
 Department: Medicine & Surgery
 Level: 100
 Matric no: 19111601432

1 Give the IUPAC names of the following compound

Compound	IUPAC Name
CH_3OCH_3	Methoxymethane
$\text{H}_3\text{CCH}_2\text{OCH}_2\text{CH}_3$	ethoxyethane
$(\text{C}_2\text{H}_5)_2\text{O}$	Dioxymethane
$\text{CH}_3\text{CH}_2\text{OCH}_3$	Methoxy ethane
$\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$	ethoxy propane

2 Discuss the properties of ethers

- i) Reactivity: They are inert at moderate temperature and it leads to their wide use as reaction media
- ii) Physical States: They are colourless, neutral liquids with pleasant odour at room temperature. Lower aliphatic ethers are highly flammable gases of volatile liquids
- iii) Density: Most are less dense than water, although density increases with increasing relative molecular mass and some aromatic ethers are denser than water

3 Discuss explicitly two methods of preparing ethers and show equations of reactions

Solution

i) Controlled catalytic hydration of alkenes

$$2\text{C}_3\text{H}_7\text{CH}=\text{CH}_2 + \text{H}_2\text{O} \rightarrow (\text{C}_3\text{H}_7)_2\text{CH}-\text{O}-\text{CH}(\text{C}_3\text{H}_7)_2$$

2-Isopropoxypropane

ii) From haloalkanes and dry silver oxide

$$2\text{RX} + \text{Ag}_2\text{O} \xrightarrow{\text{warm}} \text{R}-\text{O}-\text{R} + 2\text{AgX}$$

E.g. $2\text{C}_3\text{H}_7\text{CH}_2\text{CH}_2\text{Cl} + \text{Ag}_2\text{O} \xrightarrow{\text{warm}} \text{C}_3\text{H}_7\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{C}_3\text{H}_7 + 2\text{AgCl}$

Propoxypropane

4 State 3 uses of ethylene oxide

- i) It is used as a gaseous sterilising agent
- ii) In preparation of non-ionic emulsifying agents, plastics etc
- iii) Used as an intermediate in hydrolytic manufacture of ethylene glycol