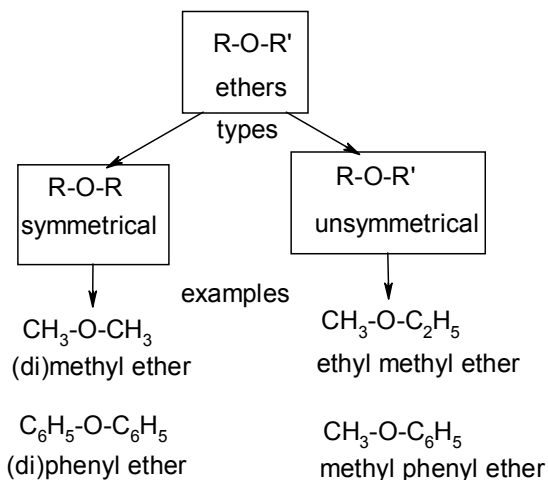


ETHERS AND EPOXIDES



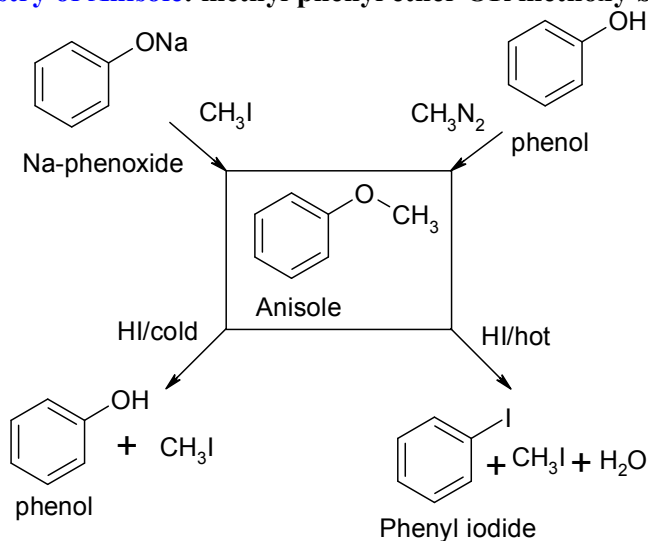
Nomenclature:

Common names: ether is named as alkyl ether or alkyl alkyl ether

IUPAC names: ether is named as alkoxy alkane (where small alkane is alkoxy)

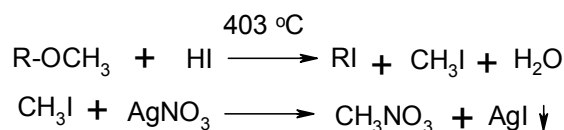
compound	Common name	IUPAC name
CH ₃ -O-CH ₃	Methyl ether	Methoxy methane
CH ₃ -O-C ₂ H ₅	Methyl ethyl ether	Methoxy ethane
C ₆ H ₅ -O-C ₆ H ₅	Phenyl ether	Phenoxy benzene
C ₆ H ₅ -O-C ₃ H ₇	Propyl phenyl ether	Propoxy benzene

Chemistry of Anisole: methyl phenyl ether OR methoxy benzene



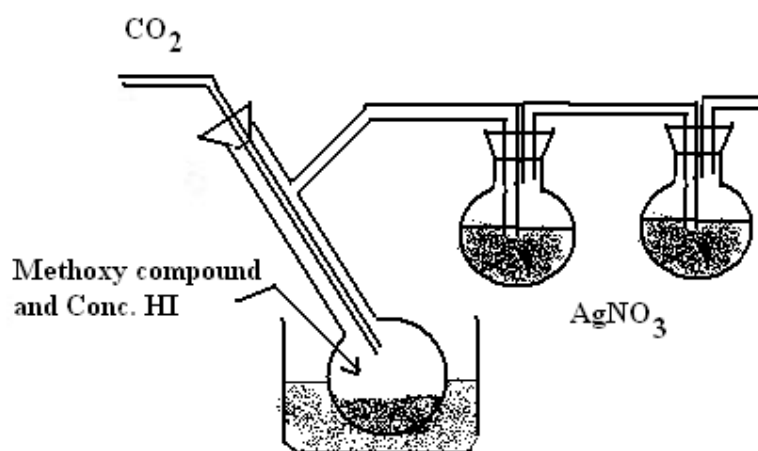
Gravimetric estimation of methoxy group (Ziesel's method)

Principle:



Methoxy ether converted to methyl iodide which on reaction with AgNO_3 precipitates equivalent AgI , from the weight of which, wt and number of methoxy group is calculated.

Procedure: A known weight of methoxy compound is taken in a long neck distillation flask and 15 CC of Conc. HI is added. To avoid bumping, few pieces of porcelain added. The flask is heated to get the vapours of CH_3I which are swept by CO_2 gas to get absorbed in the alcoholic AgNO_3 solution kept in absorption flasks. The precipitate of AgI formed in the flasks is filtered, dried and weighed.



Relation:

one mole of $\text{AgI} \equiv$ one mole of $\text{CH}_3\text{I} \equiv$ one mole of methoxy group
235 gm of $\text{AgI} \equiv$ 31 gm of methoxy group

Problem: 0.070×10^{-3} kg of methoxy compound on Ziesel's estimation, gave 0.154×10^{-3} kg of AgI , if molecular wt of the methoxy compound is 108, calculate % and number of methoxy group in it.

Solution:

one mole of $\text{AgI} \equiv$ one mole of $\text{CH}_3\text{I} \equiv$ one mole of methoxy group
235 gm of $\text{AgI} \equiv$ 31 gm of methoxy group

$\therefore 0.154 \times 10^{-3}$ kg of $\text{AgI} \equiv 0.154 \times 10^{-3} \times 31 \div 235 = 0.02031 \times 10^{-3}$ kg of methoxy gr.

As 0.070×10^{-3} kg of methoxy compound $\equiv 0.02031 \times 10^{-3}$ kg of methoxy gr.

1 mole i.e. 108 gm of methoxy compound $\equiv 108 \times 0.02031 \times 10^{-3} \div 0.070 \times 10^{-3}$ gm of methoxy gr.
 $= 31.3354$ gm of methoxy gr.

Number of methoxy groups: weight of methoxy groups \div mol. Wt of methoxy group

Number of methoxy group $= 31.3354 \div 31$

$$= 1.011 \approx 1$$

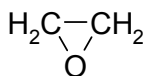
(As weight of 1 methoxy group is 31, number of methoxy groups is approximately 1.)

Epoxydes:

Epoxydes are cyclic ethers containing three membered epoxy ring which is called oxirane ring. Examples: ethylene oxide, propylene oxide.



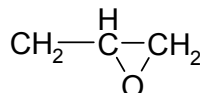
epoxyde/oxirane



ethylene oxide

or

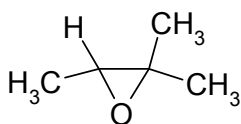
epoxy ethane



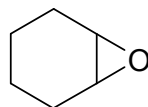
propylene oxide

or

epoxy propane



3-methyl-2,3 epoxy butane



1,2-epoxy cyclohexane

Nomenclature:

Common names: Epoxydes are named as **alkylene oxides** as above.

IUPAC: Epoxydes are named as **epoxy alkane**.

Chemistry of epoxy ethane:

