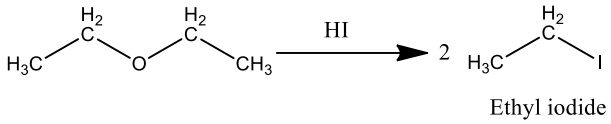
Answer on Question #53169 – Chemistry – Organic Chemistry

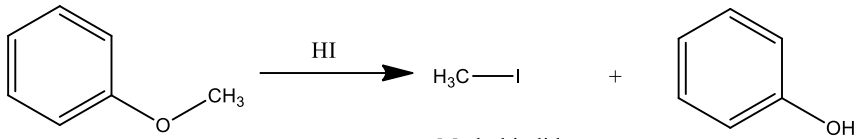
What would be the final product of the reaction of HI with diethyl ether and anisole? Explain. Write the application of Zeisel method along with its brief experimental details.

Answer:

The final products of the reactions of HI with diethyl ether and anisole are:



Ethyl iodide



Methyl iodide Phenol

Upon heating with HI the compound containing R-O group undergoes hydrolytic cleavage of C-O bond resulted in the formation of Alkyl iodides. If one of the R group has aromatic nature it is only transformed into R-OH derivative (phenols).

The aim of Zeisel method is a quantitative determination of the number of alkyl groups bound with the oxygen atom in the organic substances. It consists of two steps:

The first one is the mixing sample with a hot HI in acetic acid:

$R'\text{-}O\text{-}R + HI \rightarrow R'I + RI + H_2O$

The second step is the distillation of formed alkyl iodide into the solution containing $AgNO_3$. The compounds react with $AgNO_3$ resulting in a precipitate of AgI. Since its mass is associated with the amount of formed RI its value gives the number of alkyl groups.

$RI + AgNO_3 + H_2O \rightarrow AgI\downarrow + ROH + HNO_3$