AMINES AND UREA

08-05-2020 (Lecture-4)

Deg-I (Sub.)
Ch-4 (Last)

TOPIC - SEPARATION OF AMINE Mixture

(1° , 2° & 3°)

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When the mixture contains salts of 1°, 2° and 3° amines along with the quaternary salt, it is first distilled with KOH. solution.

The mixture of the three amines (1°, 2°&3°) distils over.

* The quaternary salt does not react with KOH and being non-volatile is left behind.

$$R-\overset{+}{N}H_3\,Cl^- + KOH \xrightarrow{\Delta} R\text{-}NH_2 + KCl + H_2O$$

1° amine salt — 1° amine

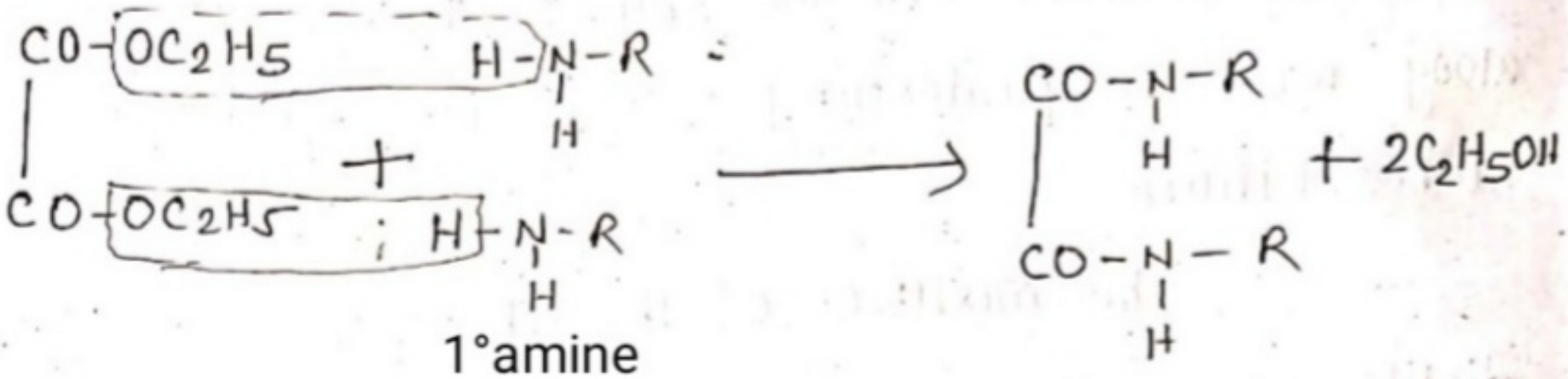
* 2° and 3° amine salts also react in this way.
* The distillate contains the mixture of 1°, 2° & 3° amines
* It may be separated by the following methods:—

1. **Fractional distillation :-** The mixture of 1°,2°&3° amines may be separated by Fractional distillation because their boiling are quite different. This method is extensively used in industry.

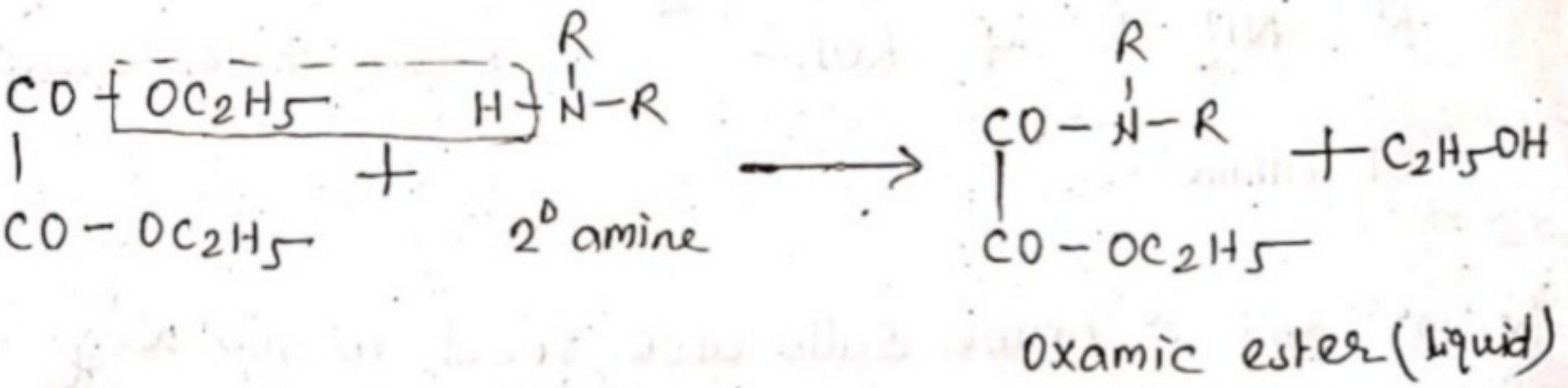
2. Hofmann Method

This involves the treatment of the mixture with diethyl oxalate.

A. 1° amine forms a dialkyl oxamide which is a solid.



B. The 2° amines forms a dialkyl oxamic ester , which is an oily liquid.



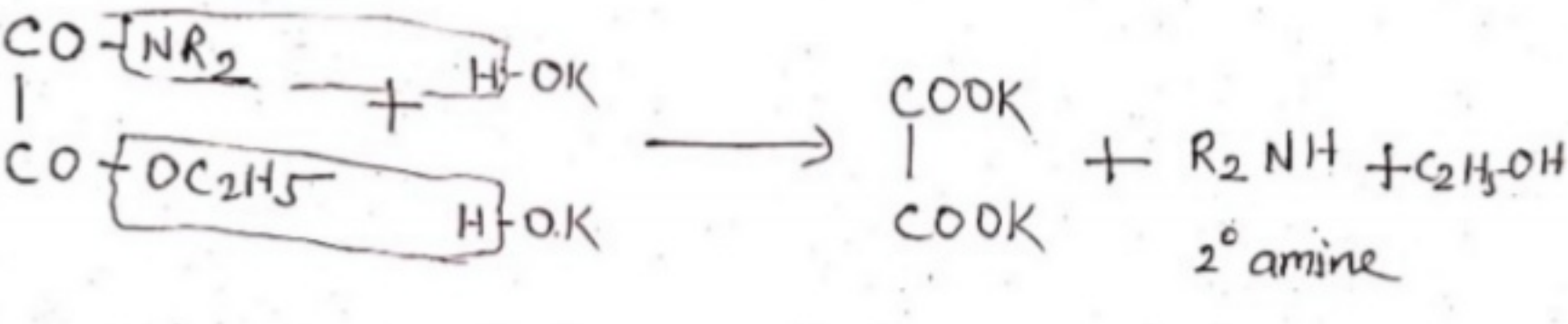
C. The tertiary amine does not react at all.

* The reaction mixture is now fractionally distilled.
The 3° amine distils over and forms the first fraction.
* This is followed by the oxamic ester which forms the second fraction.

The oxamide remains behind in the distillation flask.

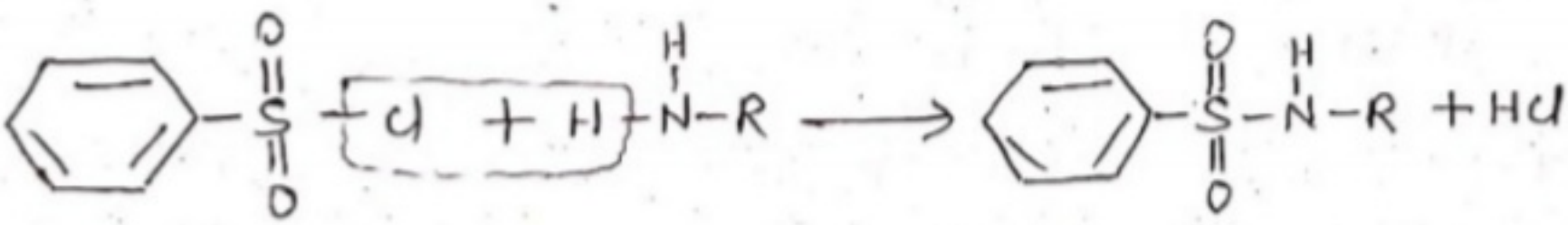
The oxamide & the oxamic ester separated as above are hydrolysed with KOH to give back the amines which are distilled off.

Oxamide



3. Hinsberg's Method

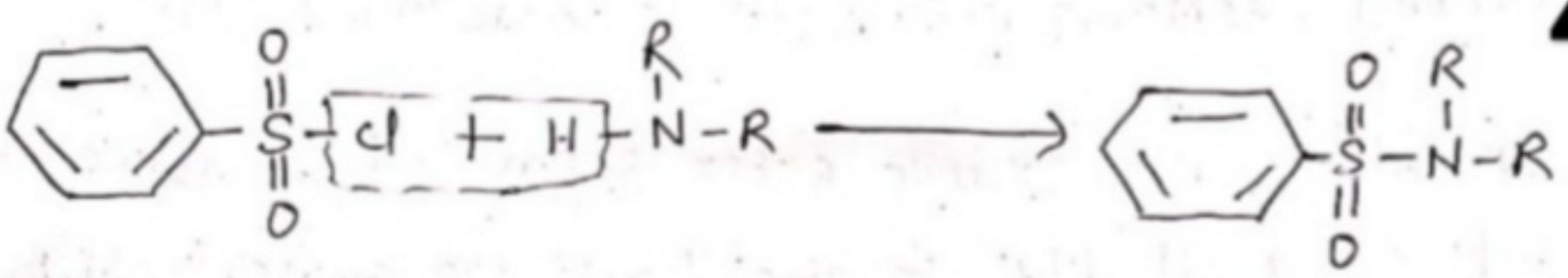
A. 1° amines react with benzene sulphonyl chloride to form N- alkylbenzenesulphonamide.



N-alkylbenzene sulphonamide

B. 2° amines react with benzenesulphonyl chloride to form N,N-dialkyl benzene sulphonamide.

4.



N,N-dialkyl benzene sulphonamide .

C. Tertiary amines do not react with benzene sulphonyl chloride.Since they do not possess a replaceable hydrogen.

These reactions are used as the basis of a test to distinguish between 1°, 2° & 3° amines

*** This test is known as Hinsberg's Test.**

USES OF ALIPHATIC AMINES

1. As Chemical Reagents.
2. In manufacturer of drugs etc.

ALIPHATIC AMINES COMPLETED .

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