CARBOXYLIC ACID & DERIVATIVES

27/11/2020 , Revision notes

TOPIC - PREPARATION, PROPERTIES AND USES OF ACID ANHYDRIDES.....$

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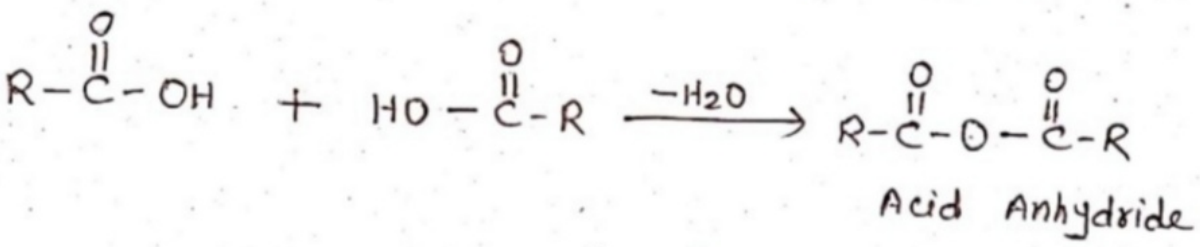
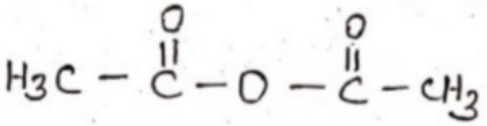
ACID ANHYDRIDES

The compounds derived by loss of a water molecule between two molecules of a carboxylic acid are called Acid anhydrides or simply Anhydrides.



Acid Anhydride

Functional Group — $-CO-O-CO-$



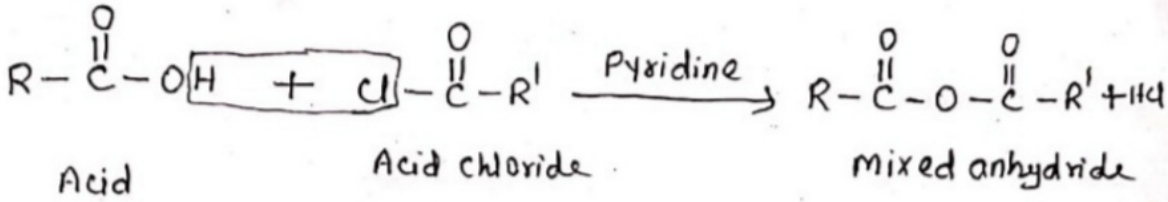
common name — Acetic anhydride

IUPAC name — Ethanoic anhydride.

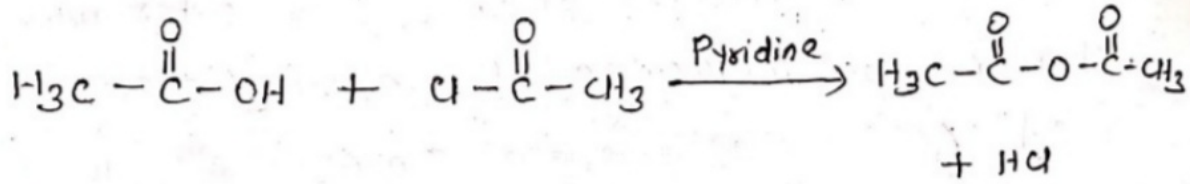
* Anhydrides derived from two molecules of different acids are called Mixed Anhydrides.

METHODS OF PREPARATION

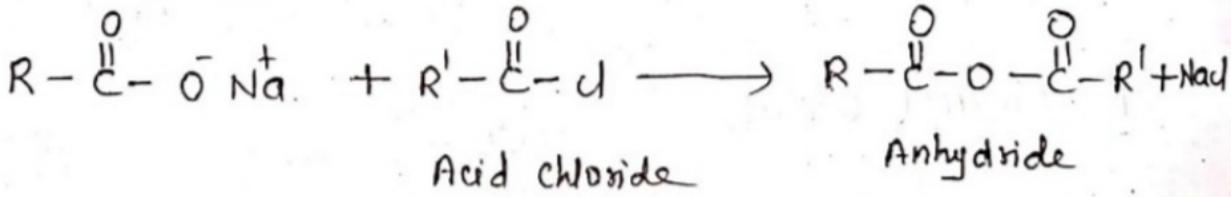
By Reaction of acid halides with a Carboxylic Acid :



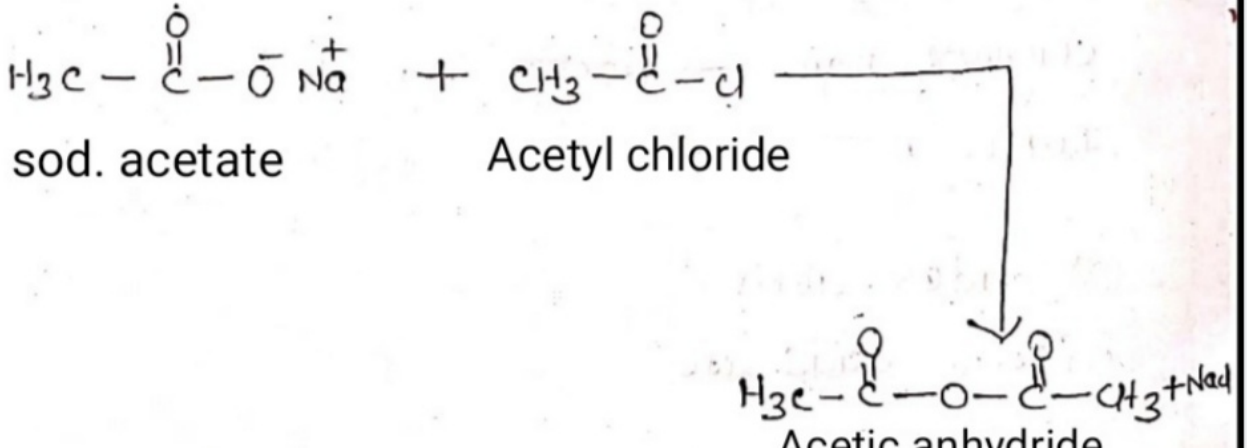
example ;



By Reaction of acid halides with salt of a Carboxylic Acid :



example ;



PHYSICAL PROPERTIES

1. The lower simple anhydrides are colourless liquids with a sharp pungent smell.

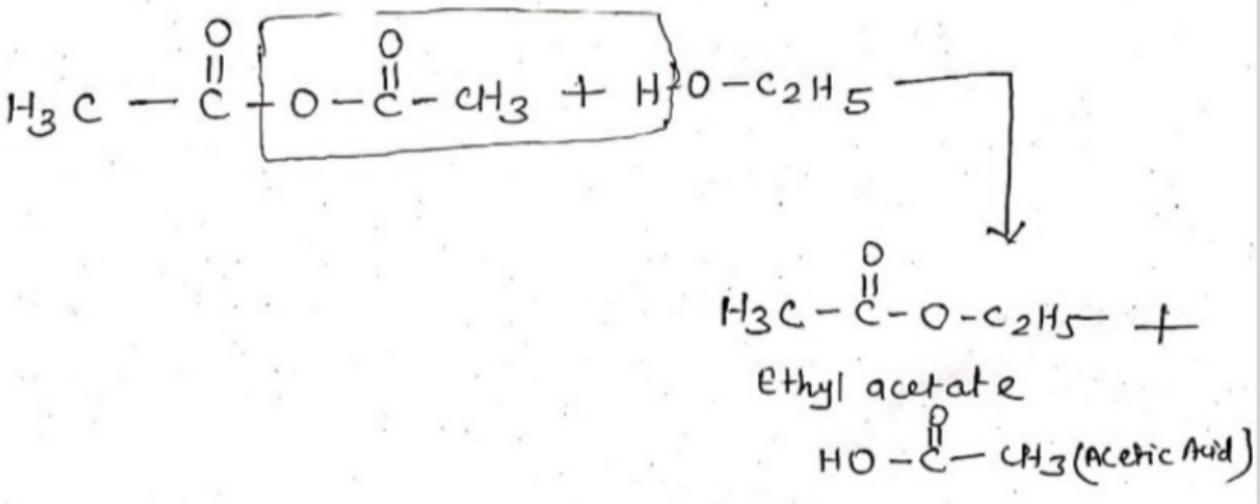
2. They are insoluble in water for lack of hydrogen bonding.
   But they dissolve after a while due to conversion to the soluble acid by hydrolysis.

3. They are characterised by the C=O stretching band in IR spectrum at frequency range 1800 – 1850 and 1740 – 1790 cm^{-1}.

CHEMICAL PROPERTIES

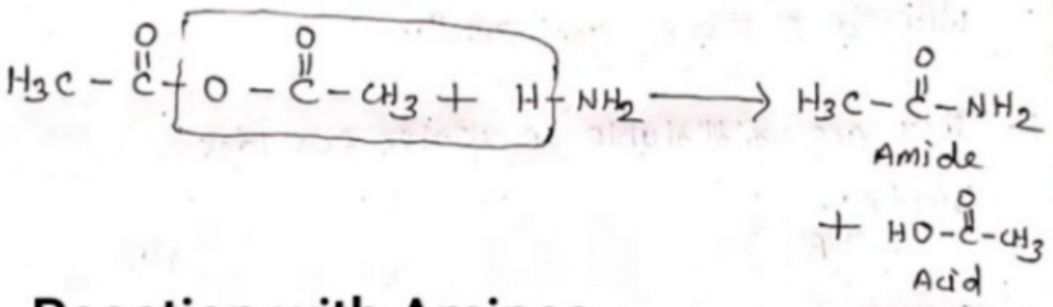
1. Reaction with Alcohol : –

Ester are formed.

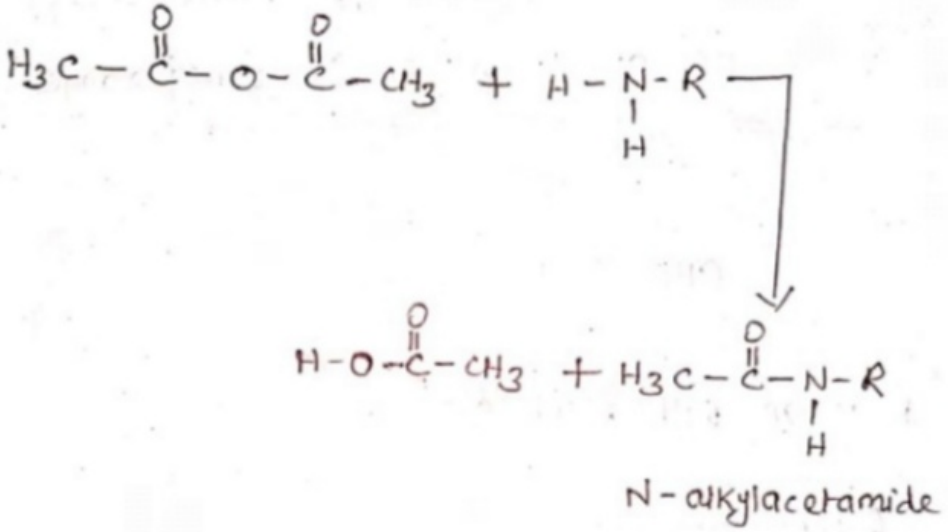


2. Reaction with Ammonia

Amide are formed.

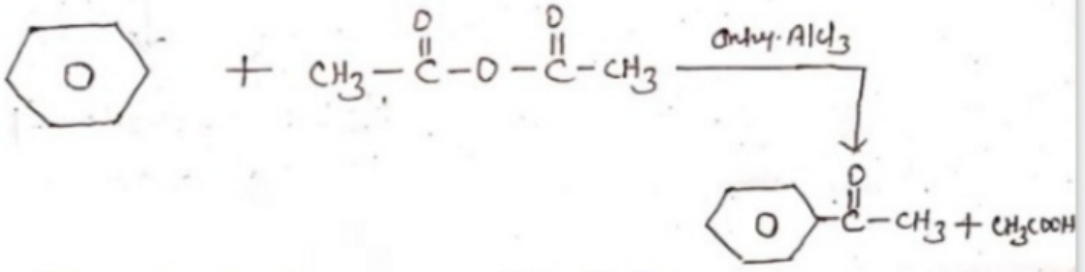


3. Reaction with Amines



4. Reaction with benzene in the presence of AlCl3.

Ketones are formed. This is called Friedel craft's reaction



Acid anhydrides completed..

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