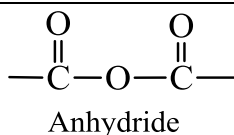


Experiment 5

Preparation of N-substitution Imides

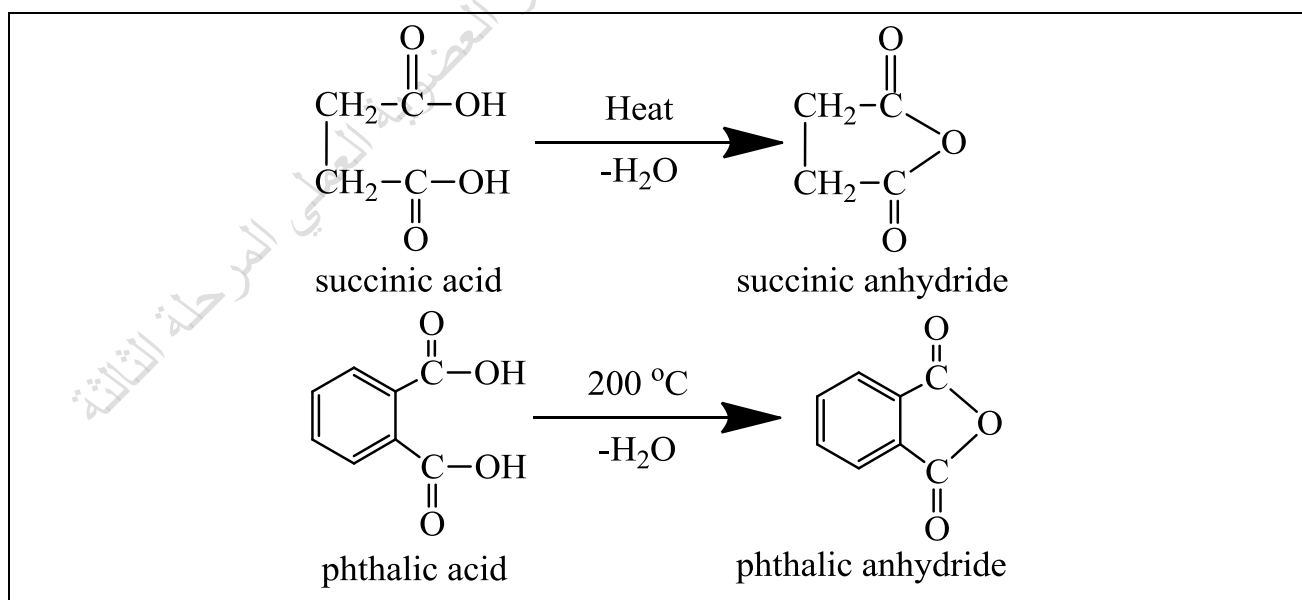
Theoretical part:

Anhydrides : are organic compounds , General formula is

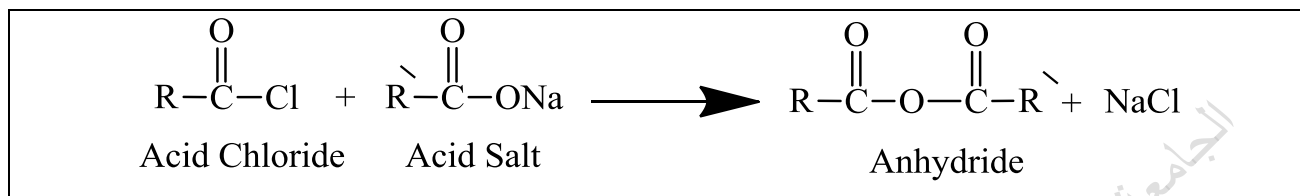


Preparation of anhydrides :

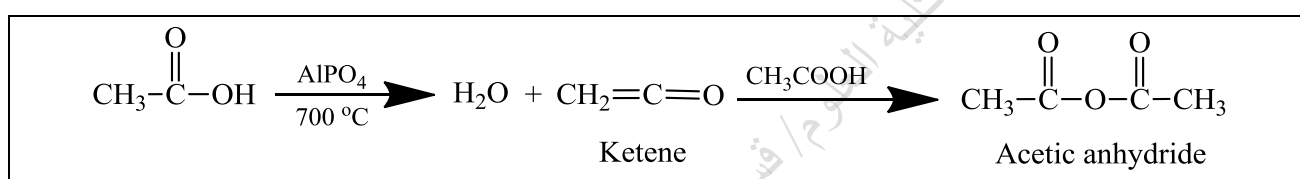
Anhydrides are a derivatives of carboxylic acids by removing the water molecule from carboxylic acids .



Can be prepared in the laboratory from the interaction between acetyl chloride with sodium acetate:



Industrially the preparation is by of the dehydration reaction of acetic acid at temperature up to 800 °C :

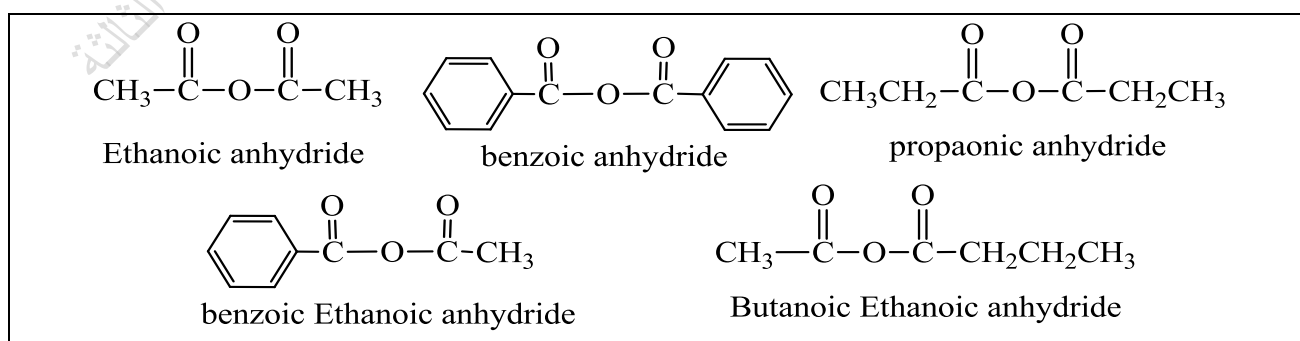


Nomenclature :

Symmetrical acid anhydrides are named by replacing the word acid in the name of the parent carboxylic acid by the word anhydride.

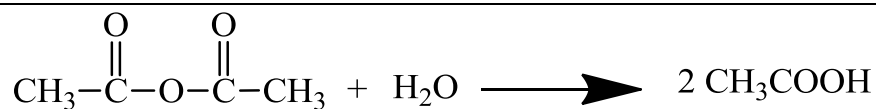
Unsymmetrical acid anhydrides are named by first naming each component of carboxylic acid alphabetically arranged (without the word acid) followed by the word anhydride.

Examples:

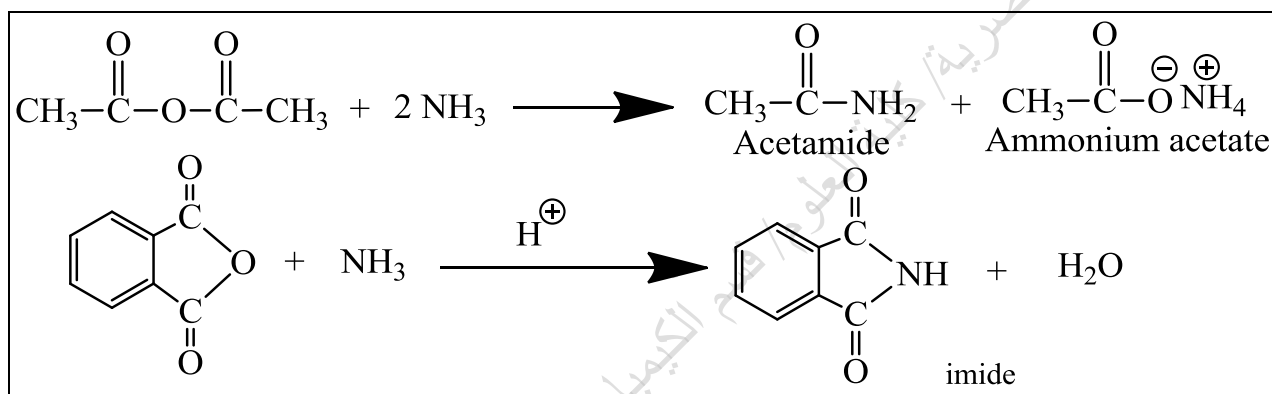


Reaction of anhydrides :

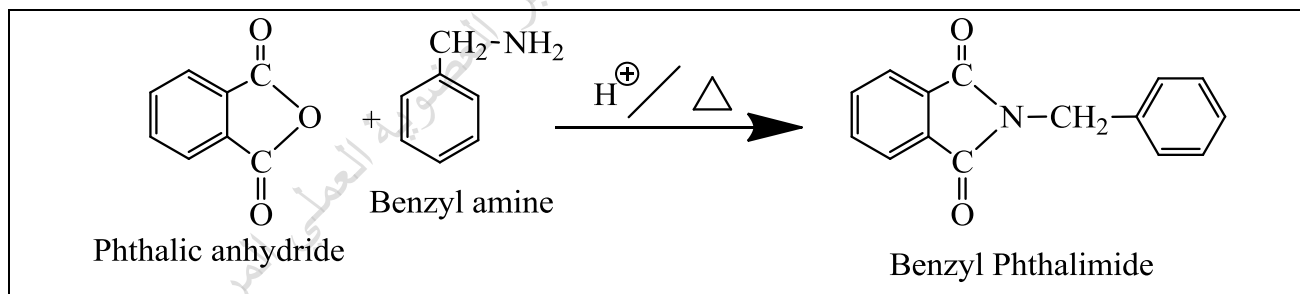
1- The reaction with water



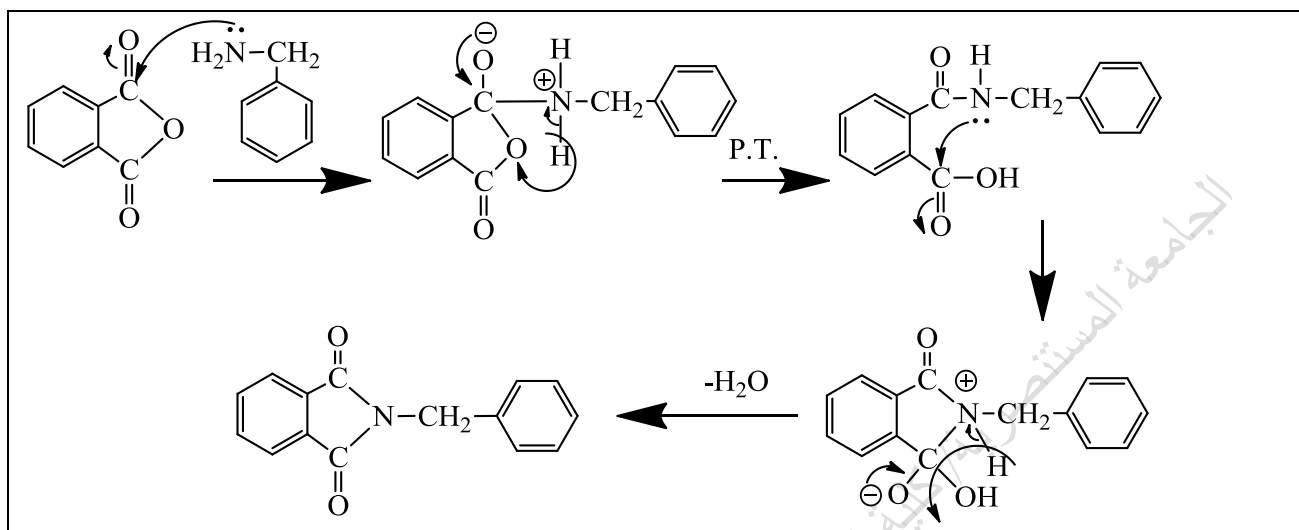
2- The reaction with ammonia or amines formed amide, while imides are formed by reaction of cyclic anhydride and amines :



Interaction equation:



The mechanism for the reaction:



Experimental part:

- 1- In (100ml) round bottomed flask, dissolve phthalic anhydride (0.5g) and benzyl amine (0.5ml) in (5ml) of glacial acetic acid and stirred the mixture .
- 2- The mixture reflux for (30mins) while stirring continually.
- 3- The mixture is Cooled after reflux finish and added on ice-cold water with shacking for (5 mins) until a white precipitate is formed .
- 4- The solid product is filtered and dried .
- 5- The N-benzyl phthalimide is Recrystallized from ethanol.
- 6- The product is Weighted and The percentage of yield is calculated .