



SYNTHESIS OF ESTER

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Outline

- ✓ Ester
- ✓ Structure and Mechanism
- ✓ Procedure



Objectives

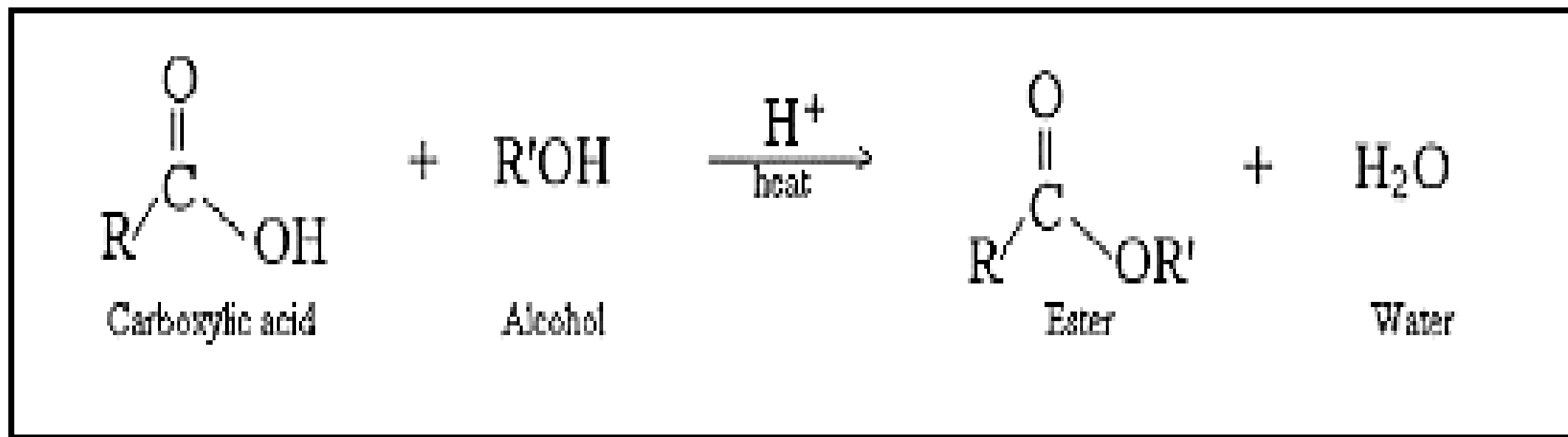
- Synthesis of Ester.

Ester



- The esters are a group of organic compounds best known for their interesting odors.
- Many perfumes and artificial flavorings are esters. Esters are formed when a carboxylic acid reacts with an alcohol in the presence of a strong acid.

A general equation for the formation of esters:





The R and R' represents alkyl groups such as methyl, ethyl, or propyl. The esters are named after the compounds from which they are formed. The first part of the name comes from the alcohol and the second part of the name comes from the carboxylic acid.

Thus when ethyl alcohol (ethanol) combines with acetic acid, the resulting ester is named ethyl acetate.

Catalytic Reaction



- The synthesis of an ester must be done in the presence of an acid in order to push the reaction closer to completion. The reaction can be reversed by adding a strong base, such as NaOH.
- The acid that you will be using as a catalyst in this experiment is sulfuric acid.



- Many of the aromas of natural fruits and flowers are due to simple esters.
- Octyl ethanoate has the odor of oranges, while apricots owe their characteristic aroma to pentyl butanoate.

Apparatus

- Beaker (250 ml)
- 2 test tubes
- Thermometer
- Test tube rack
- Safety goggles
- Dropper pipette
- Full face shield
- Centigram balance ix. Glazed paper
- Plastic gloves
- Graduated cylinder (10ml)
- Hotplate



Procedure



- Two test tubes were taken and labeled them as A and B.
- Following reagent in the following ratio:
 - 1 ml acetic acid 1 ml ethanol
 - 1g salicylic acid 1 ml methanol
- 3.4 drops of conc. sulfuric acid was carefully added to each test tube.
- About 150 ml of water was putted in a 250 ml beaker. The test tubes were placed into the water and heated the water on a hot plate to a temperature of 60°C. The test tubes were heated in the hot water bath for 15 minutes. It was ensured that, the water bath remained at approximately 60°C for that period of time.



- The test tubes were cooled for a few minutes and then immersed in an ice bath. This step was added to prevent any test tubes from cracking.
- 5 ml of distilled water was added to each of the test tubes. This step was included to dilute the ester and soften its odor.
- The odor of the contents of each of the test tubes was carefully noted. It was done by wafting the odors of the test tubes toward the nose. The observations were documented in the table.

Question & Homework



What is the reaction used to prepare the ester? What catalyst we use in our lab.

H.W. Write the equation of ester preparation and describe the relation between the yield and the reactant?

Is ester soluble in water? Give reason for your answer.