

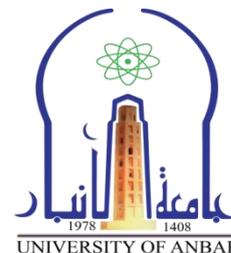


Ministry of Higher Education and Scientific Research

University of Anbar

Science College

Department of Chemistry



ORGANIC DIAGNOSIS PRACTICAL

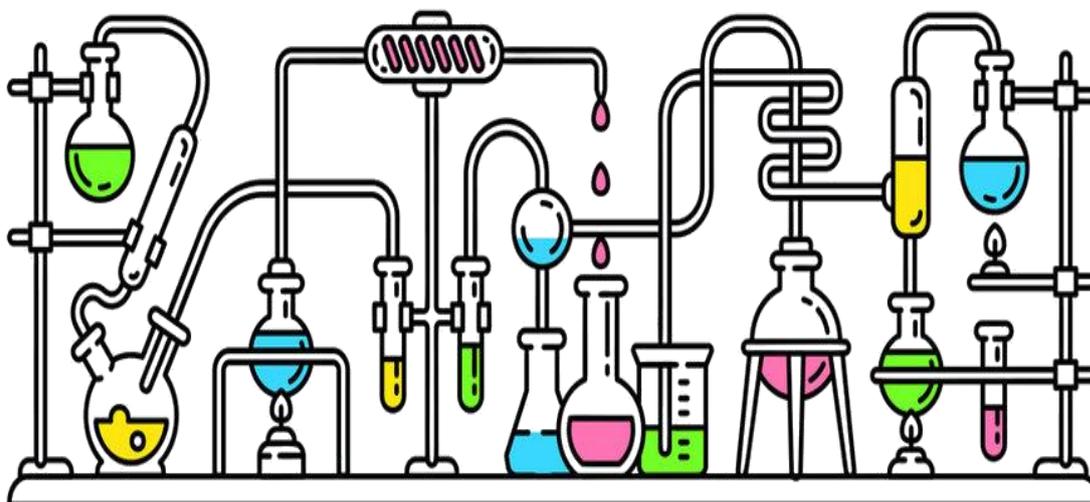
Fourth stage

EXPERIMENT 8

By

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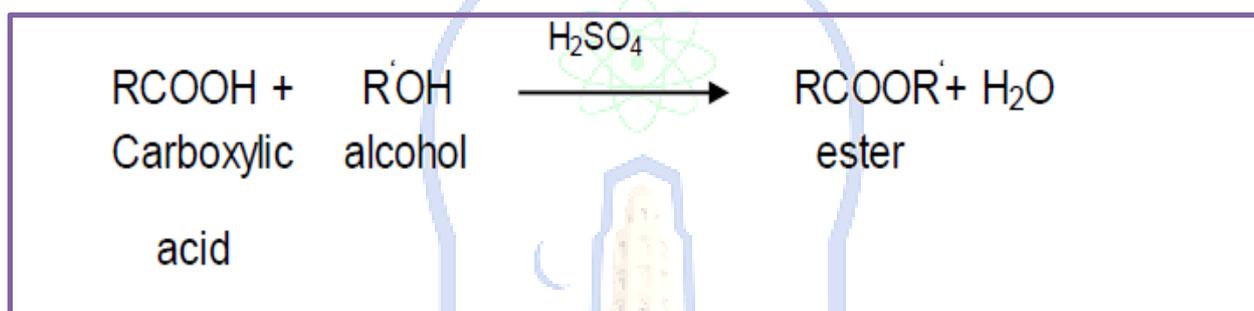
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EXP8 :-THE PROPERTIES AND PREPARATION OF ESTERS AND SOAP

In this experiment we are going to prepare several esters and not their characteristic aromas. we will also prepare soap an carboxylic acid salt

✓ Esters:

The general formula for an ester is RCOOR'. An ester can be prepared by reacting an alcohol with carboxylic acid. The R group in the general formula was part of the acid. The other group, symbolized R' was part of the alcohol. Sulfuric acid catalyzes the reaction.



The names of esters are similar in form to those of the salt of carboxylic acids.



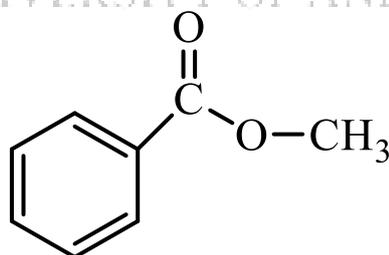
Methyl formate



methyl acetate



ethyl acetate

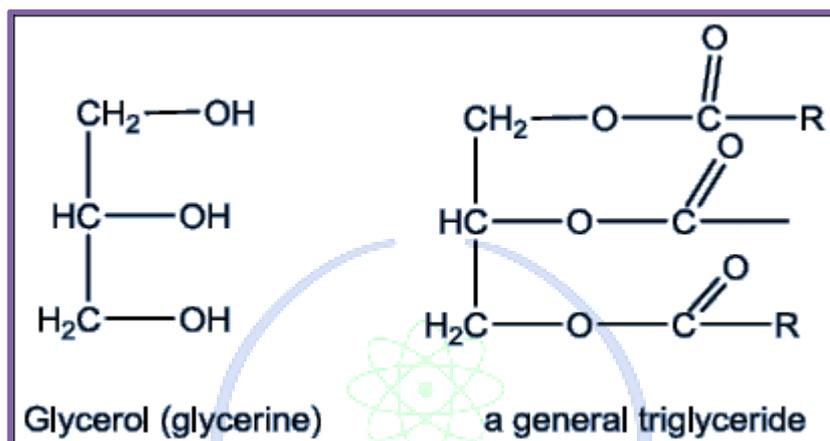


Methyl benzoate

Many esters are colorless liquids with pleasant, fruity aromas. The aroma and flavor of many foods are due to the presence of esters.

✓ Triglycerides:

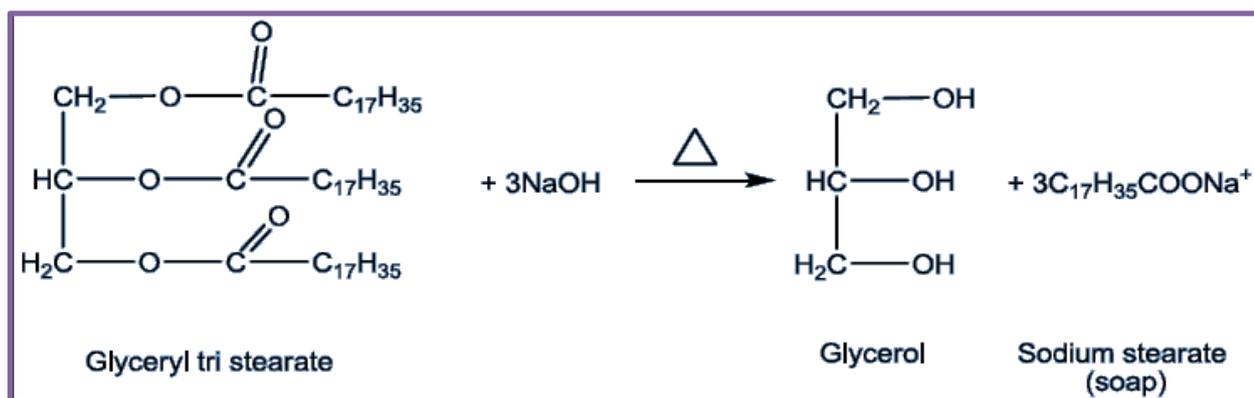
Triglycerides are triesters, containing three ester functional groups per molecule. They are large molecules that can be considered the products of the reaction of glycerol (an alcohol containing three –OH groups that is also called glycerine) with three fatty acids. Fats and oils are triglycerides.



✓ The preparation of soap - Saponification

Soap is prepared by the hydrolysis of triglycerides in the presence of strong base like NaOH or KOH. Instead of obtaining a fatty acids as products of the hydrolysis. The Na or K salt of the fatty acids is obtained. If a fatty acid did form in the hydrolysis, it would quickly be neutralized by the NaOH or KOH to form the soap.

The soluble salt of a fatty acid is soap. The reaction that produces soap is called Saponification and it is of great industrial importance. Sodium stearate is produce when glyceryl tri stearate, from animal fat, is heated in the presence of aqueous NaOH. Sodium stearate is the primary component of Ivory soap.



Procedure:

A. Preparation of some esters

1. Place the following reagents in the labeled test tubes:

- + Test tube A: 20 drops of ethanol + 20 drops of glacial acetic acid + 10 drops of concentrated H₂SO₄.
- + Test tube B: 20 drops of pentanol + 20 drops of glacial acetic acid + 10 drops of concentrated H₂SO₄.
- + Test tube C: 20 drops of benzoic acid + 20 drops of ethanol + 10 drops of concentrated H₂SO₄.

2. Stir the contents of each test tube. When the water bath has reached 85o C, turn off the burner and place stoppered test tube in the hot water.

3. After 10 min. removes the stopper from each tube and notes the odor should product. You be able to detect the aroma of banana, butter rum, 26

finger nail and minty scent of wintergreen. Record the aroma of each mixture on the report sheet, then complete the equation and name the ester.

B. Preparation of soap

1. In an evaporating dish, mix 2 ml of vegetable oil and 3 ml of ethanol, this is a good solvent for both triglyceride (the vegetable oil) and NaOH. Add 20 drops of 50 % NaOH.

2. Heat the mixture, while stirring, with a moderate, almost luminous flame until it becomes a thick paste. Allow the evaporating dish to cool. Note the appearance of the

product on the report sheet, then complete the equation and name the products of the saponification reaction.