

Grade 12 Organic Chemistry Practical - ESTERS

Aim: To prepare a number of common esters.

Safety

 sulphuric acid ethanoic acid other acids	 methanol	 methanol ethanol pentan-1-ol other alcohols	 ethanol	 Wear goggles and lab coats at all times.
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Apparatus:

- boiling tubes x 3 and rack
- 100 ml beaker
- 250ml beaker
- water bath or access to hot water
- dropping funnels

Chemicals:

- carboxylic acids & alcohols as per table below (2-3 cm³ each)
- concentrated sulphuric acid

Method:

1. In a Pyrex test tube, place about 2-3 ml of methanol and approximately ~1 gram of salicylic acid.
2. Add a few boiling chips to the bottom of the tube.
3. To this mixture add about 0.5 ml (about 15 drops from a dropping bottle) of concentrated sulphuric acid.
4. Warm this mixture in a water bath for 5 or 6 minutes.

Caution: DO NOT point the test tube toward yourself or anyone else. Organic compounds such as the one being produced in this experiment may vaporise and spurt out the mouth of the test tube.

5. Pour the contents of the test tube into a beaker containing 50 ml of cold water.
6. Cover the beaker, let stand for a minute or two and then note the odour. Compare this odour with that of methanol. Do you recognise the odour? Have you used something that smells the same?
7. The Ester and water can be flushed down the sink with running water. Rinse out your beaker.
8. Now repeat this process but using a different combination of acid and alcohol from the table below.
9. For each reaction:
 - a. try and identify the smell of the ester.
 - b. write the name of the ester in the table.
 - c. Write a reaction equation for the formation of the ester using full structural formulae.

Some common Esters and their odours.

ACID	ALCOHOL	ESTER	SMELL
Methanoic	methanol		"duco"/paint thinners
Ethanoic	ethanol		Pear drops / nail varnish remover
Propanoic	Ethanol		pineapple
Ethanoic	Pentanol		banana
Salicylic	methanol	Methyl salicylate	oil of wintergreen

Grade 12 Physical Science Practical Esters

S Ben Porath



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