# Microscale synthesis of aspirin – teacher notes

In this experiment students prepare 2-ethanoyloxybenzenecarboxylic acid (aspirin) from the reaction between 2-hydroxybenzoic acid (salicylic acid) and ethanoic anhydride, using phosphoric acid as a catalyst.

The use of chemical splash goggles is recommended.

The reaction is:



## Topic

Medicines and organic synthesis

## Timing

20 minutes

## Equipment

### Apparatus

* Eye protection
* Beaker, 10 cm3
* Hot plate
* Measuring cylinder, 5 cm3
* Beaker, 50 cm3
* Test tube
* Small filter funnel

### Chemicals

* 2-hydroxybenzoic acid (salicylic acid)
* Ethanoic anhydride
* Phosphoric acid (85%)

## Observations

This esterification reaction, which uses reactive ethanoic anhydride and phosphoric acid catalyst, is quite fast at microscale. A good yield of white crystals should be formed.

## Reference

*J.Chem.Ed*., 1987, **64**, 440.

## Health, safety and technical notes

* Read our standard health and safety guidance (<https://rsc.li/33PrOhX>).
* Wear eye protection throughout (splash-resistant goggles to BS EN166 3).
* This experiment should be done in a fume cupboard.
* 2-hydroxybenzoic acid – see CLEAPSS Hazcard HC052. 2-hydroxybenzoic acid (salicylic acid) is HARMFUL if swallowed or in contact with the skin and can cause eye damage.
* Ethanoic anhydride – see CLEAPSS Hazcard HC039. Ethanoic anhydride is CORROSIVE, HARMFUL if swallowed or inhaled and FLAMMABLE.
* Phosphoric acid – see CLEAPSS Hazcard HC072. Phosphoric acid (85%) is CORROSIVE.