Aspirin synthesis for AS/A2 Level chemistry.

Aspirin is one of the most commonly used drugs in the world, so why not bring chemistry out of the text books, and synthesise aspirin in the undergraduate chemistry laboratory at Reading University. Using familiar A' level chemistry, you will produce aspirin using an esterification reaction with ethanoic anhydride. The starting material, for this synthesis, is 2-Hydroxybenzoic acid (salicylic acid). Salicylic acid is the naturally occurring analgesic, that can be extracted from willow bark, but is very bitter and less effective than aspirin.

The reaction

The aspirin is formed when you reflux ethanoic anhydride, phosphoric acid, and 2-hydroxybenzoic acid together for 15 minutes. Quenching the reaction mixture with cold water forces the crude aspirin out of solution. This crude aspirin can then be isolated by filtration.

Re-crystallisation

The crude aspirin obtained, is purified by re-crystallisation from a minimum volume of hot aqueous ethanol. The pure aspirin crystals formed are separated and dried by vacuum filtration.

Testing the product

The purity of your aspirin sample can then be assessed by using both: thin layer chromatography (TLC), with visualisation by U.V. and determination of its melting point.

What the students thought about the aspirin synthesis:

“Very interesting and fun to do”

“We used different types of equipment not available at school”

“It showed the usefulness of chemistry in real-life situations”