

## Colorimetric analysis of aspirin

### Teacher and technician sheet

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#### Health and safety note:

Make sure that students wear appropriate eye protection. 1 mol dm<sup>-3</sup> sodium hydroxide solution is corrosive. Consider whether students should wear disposable chemical resistant gloves when preparing the aspirin solutions.

#### Equipment and materials

Each student or pair of students will require:

- Colorimeter and suitable filter (green/yellow).  
A solution of the complex displays maximum absorption at about 530 nm
- Cuvette
- 100 cm<sup>3</sup> conical flask
- Bunsen burner, tripod and gauze (or an electric hotplate)
- Aspirin – Harmful
- 500 cm<sup>3</sup> volumetric flask (x2)
- 50 cm<sup>3</sup> burette
- 100 cm<sup>3</sup> volumetric flask (x5)
- 1 cm<sup>3</sup> pipette and pipette filler
- 1 mol dm<sup>-3</sup> sodium hydroxide solution – Corrosive
- 0.02 mol dm<sup>-3</sup> iron(III) chloride solution

If there are insufficient numbers of volumetric flasks, one may be used for each solution preparation provided it is washed thoroughly between solution preparations. Describe or demonstrate to students how the volumetric flasks need to be cleaned before being used to measure new solutions.

If volumetric flasks are not available, measuring cylinders may be used. While there is loss of accuracy, the principle of the method is still illustrated.

#### Preparation of solutions

To make up the iron(III) chloride solution you will need:

- 1 dm<sup>3</sup> volumetric flask
- Concentrated hydrochloric acid – Corrosive
- Potassium chloride
- Iron(III) chloride-6-water – Harmful
- Deionised/distilled water

**0.02 mol dm<sup>-3</sup> iron(III) chloride solution** Weigh out 5.44 g iron(III) chloride-6-water and transfer quantitatively to a 1 dm<sup>3</sup> volumetric flask. Add about 100 cm<sup>3</sup> deionised water and swirl the flask to dissolve the solid. Now add 3 cm<sup>3</sup> of concentrated hydrochloric acid and 10 g of potassium chloride. Again swirl the contents of the flask to dissolve the potassium chloride before making up to the mark with deionised water.

For a colour matching microscale method see:

<http://media.rsc.org/Microscale%20chemistry/Microscale%2054.pdf>