

Determining the pK_a of 2-hydroxybenzoic acid

Teacher and technician sheet

Health and safety note

Make sure that students wear eye protection and that there are no naked flames. 0.1 mol dm^{-3} sodium hydroxide is an irritant. 95% ethanol is highly flammable. 2-hydroxybenzoic acid and 95% ethanol are both harmful.

Equipment and materials

Each student or pair of students will require:

- Access to a balance (2 or 3 d.p.)
- 50 cm^3 burette
- 250 cm^3 beaker
- Glass stirring rod
- 10 cm^3 and 100 cm^3 measuring cylinders
- Spatula
- pH probe and pH meter
- 2-hydroxybenzoic acid – Harmful
- 95% ethanol – Highly flammable, Harmful
- 0.10 mol dm^{-3} sodium hydroxide solution – Irritant

Calibration of pH probe

The pH probe (electrode) should be calibrated using two standard buffer solutions. Most pH probes and meters contain instructions for calibration and use.

Values

For 2-hydroxybenzoic acid:

$$pK_a = 2.97$$

$$K_a = 1.07 \times 10^{-3} \text{ mol dm}^{-3}$$