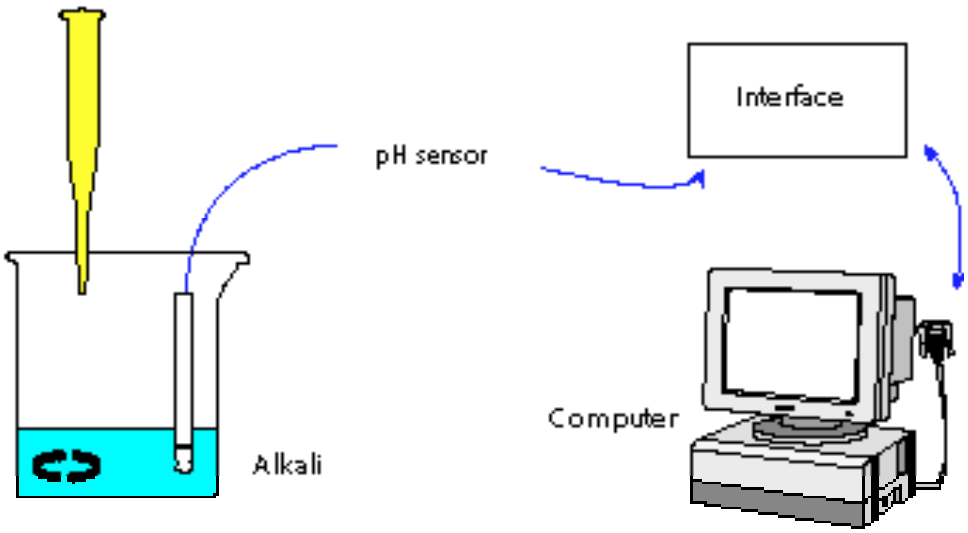
Acid-base titration



As acid drains into alkali the pH changes. This can be monitored using a pH sensor and instantly produce a graph of pH against volume. The volume of acid added is entered using the keyboard. The experiment can be repeated using different combinations of strong and weak acid.

Apparatus

Burette, stand, magnetic stirrer, indicator soln., pH electrode, pH buffer solution, 200cm^3 0.1 M sodium hydroxude NaOH, 50cm^3 0.5M hydrochloric acid HCl, 200cm^3 0.1M ethanoic acid CH_3COOH, 200cm^3 beakers, interface, pH sensor/ electrode.

Setting up

Set up a beaker with 20 cm^3 alkali & indicator, place on the stirrer. Fill the burette with acid.

Connect the pH electrode to the pH sensor. Connect the pH sensor to socket 1 on the interface.

Place the pH electrode in the beaker of alkali.

Sensor identification

The software needs to know that you have connected a pH sensor. Some systems do this automatically. You may be able to calibrate the pH sensor to read correctly in known pH buffer solution.

The software also needs to know that you will be entering volumes of between 0 and 10 cm^3 via the keyboard.

Recording the data

Start recording - you should be prompted to enter a volume at the keyboard. With no acid added, type 0.

Add 1 cm^3 acid from the burette. Type in 1 for the new volume. Continue adding 1 cm^3 acid and entering the total volume each time.

Using the results

When does the pH change most slowly? Is this at the beginning, the middle or the end of the titration?

When does the pH change most rapidly?

What does the graph tell you about the change in pH during a titration?

Save your data on disk. Print the graph.