Edexcel International Chemistry A-level

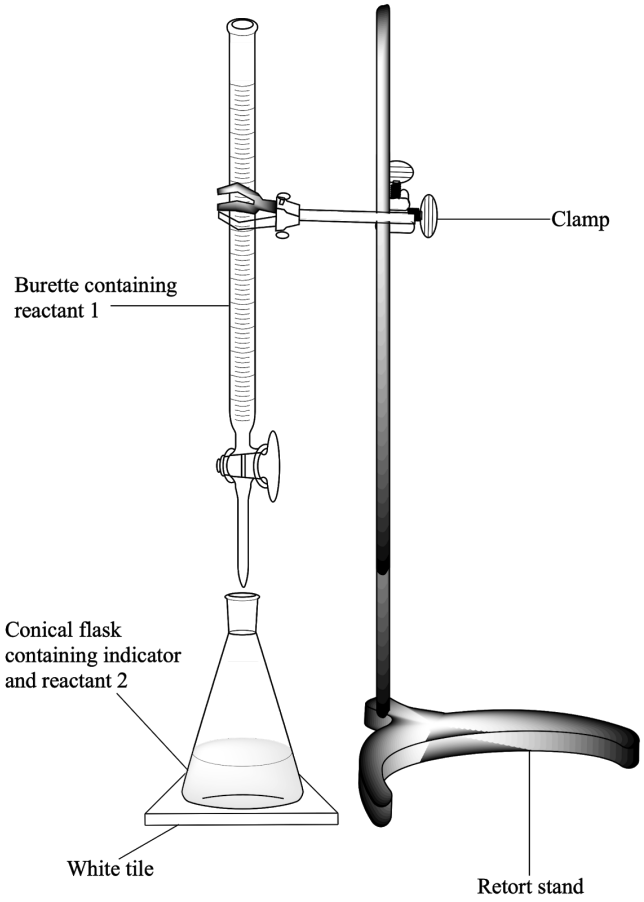
Practical 11

Finding the Ka Value for a Weak Acid

Method

1. Calibrate a pH meter or set up a data logger to record the pH
2. Fill a burette with sodium hydroxide solution and add 25 cm^3 of the acid being tested to a conical flask placed on a white tile.
3. Add a few drops of phenolphthalein indicator to the conical flask - it will be colourless.
4. Carry out a titration until the solution in the conical flask only just turns pink.
5. Add another 25 cm^3 of the weak acid to the same flask.
6. Use the pH meter to find pH. pH will equal pKa because exactly half of the acid has been neutralised so this is the half-equivalence point.
    - $[A^-] = [HA]$, therefore $Ka = [H^+]$, and so pKa = pH.]
7. To convert from pKa to Ka, calculate 10^{-pKa}

Titration apparatus



Using pH Meter

- Test the pH meter on a buffer solution of known pH or **calibrate** with deionised water and **buffer** solutions of known pH.
- Wash with deionised water between readings to remove ions attached to the bulb.
- pH meter is better than indicators because no ions are added or removed when used, it reads to 2.d.p which is far more accurate than interpreting the colours of indicators and is not subjective.

Errors

- Burette readings
- **Subjective** end point of titration.