1- Acid-base titrations using a pH meter

The change in pH during an acid-base titration may be followed with a pH meter, which is essentially a potentiometer for measuring the e.m.f of the cell:

Calomel electrode / solution / Glass electrode

The calomel electrode retains constant potential, while the glass electrode varies its potential with the hydrogen-ion concentration of the solution.

Requirements

pH meter, 0.1 M NaOH, weak acid(acetic acid) , and buffer solutions.

Method

(a) Check the pH meter after rinsing the electrode assembly in distilled water by dipping the electrodes into a standard buffer solution. Adjust the pH meter so that its pH reading agrees with the stated pH of the buffer solution (use pH 4 and 7).

(b) Place 25 ml of the weak acid in a 250 ml beaker and dip in the electrodes, adding 50 ml of distilled water stir well and take a pH reading.

(c) Run in 1 ml of 0.1 M sodium hydroxide from a burette and, after stirring well, take another pH reading.

(d) Take pH reading after each 1 ml addition of sodium hydroxide until about 5 ml from the approximate end-point, when 0.2 ml should be made, and finally 0.1 ml additions when close to the end-point. Make further additions until about 10 ml beyond the end-point.

Calculations

Plot graphs of ***pH*** against ***volume of sodium hydroxide*** added, note the pH at each end-point. Comment on the shape of the curves.

When the experiment is complete, the electrode must be left immersed in distilled water.