

## AQA Chemistry A-level

### Required Practical 9

Investigate how pH changes when a weak acid reacts with a strong base and when a strong acid reacts with weak base



## pH probe calibration:

| Method   | Accuracy   | Explanation   |
|--|--|---|
| 1. Rinse the pH probe thoroughly with deionised (distilled) water and shake gently to remove excess water. |  |   |
| 2. Place the probe in the standard pH 7.00 buffer solution provided. Record the pH reading.                | <ul style="list-style-type: none"> <li>• Ensure the bulb is fully immersed.</li> </ul>   |   |
| 3. Repeat this process using the standard pH 4.00 and pH 9.20 buffer solutions. Record the pH readings.    | <ul style="list-style-type: none"> <li>• Rinse the pH probe thoroughly with deionised water before taking each reading.</li> </ul> |   |
| 4. Plot a graph of your recorded pH reading (x-axis) against the pH of the buffer solution (y-axis).       |  | This calibration graph can be used to convert pH readings into more accurate pH values. |

## Measuring pH: acid-alkali mixture

| Method   | Accuracy   | Explanation |
|--|--|-------------|
| 1. Rinse a burette with 0.100 mol dm <sup>-3</sup> solution of ethanoic acid and then fill the burette with this solution. Label this burette. | Ensure the jet of the burette is filled without any air bubbles. |             |



|   |  |   |
|---|--|---|
| 2. Use the burette to transfer exactly 20.0 cm <sup>3</sup> of ethanoic acid to a clean 100 cm <sup>3</sup> beaker.   |  |   |
| 3. Rinse a second burette with 0.100 mol dm <sup>-3</sup> NaOH solution and then fill this second burette with this solution. Label this burette.           | Ensure the jet of the burette is filled without any air bubbles. |   |
| 4. Rinse the pH probe with distilled (deionised) water and clamp it so that its bulb is fully immersed in the ethanoic acid solution in the beaker.         |  |   |
| 5. Use a rod to stir the solution gently and record the pH reading in a suitable table  |  |   |
| 6. Add 2.0 cm <sup>3</sup> of NaOH solution from the burette at a time. Stir the solution and record the pH alongside the volume of NaOH added.             |  |   |
| 7. When the end-point is being reached, add 0.20 cm <sup>3</sup> of NaOH each time. Stir the solution and record the pH alongside the volume of NaOH added. |  |   |
| 8. After this, continue adding 2.0 cm <sup>3</sup> NaOH until it is in excess. Stir the solution and record the pH alongside the volume of NaOH added.      |  | These results allow a pH curve to be plotted. |

### Analysing the data:

- Use the pH probe calibration graph to adjust the pH readings obtained in the experiment. These corrected pH values should be entered into a new column in the table of results.
- Plot a graph of the corrected pH values (y-axis) against volume of sodium hydroxide solution added.
- Join the points in the most appropriate way (should be a curve).



Diagram:

