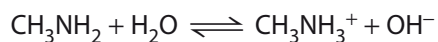


Chapter 11

Acids, bases and buffers

Print out and complete this worksheet to generate a summary for Chapter 11.

- 1** Consider the equation:



Use the equation to explain what you understand by the Brønsted–Lowry theory of acids and bases. Identify the acid–base conjugate pairs.

.....

.....

.....

.....

- 2** Using HNO_3 and HCOOH as examples, explain the difference between a strong acid and a weak acid.

.....

.....

.....

.....

- 3** For the weak acid, HCOOH , define each of the following:

a K_a

.....

b $\text{p}K_a$

.....

c pH

.....

- 4** Calculate the pH of the following acid solutions:

a $0.035 \text{ mol dm}^{-3}$ HCl

b $0.035 \text{ mol dm}^{-3}$ CH_3COOH ($K_a = 1.7 \times 10^{-5} \text{ mol dm}^{-3}$)

Chapter 11 Acids, bases and buffers

5 Calculate the pH of a $0.080 \text{ mol dm}^{-3}$ solution of potassium hydroxide.

6 a Explain what is meant by a *buffer solution*.

.....

.....

.....

b Explain how a mixture of sodium butanoate and butanoic acid acts as a buffer solution.

.....

.....

.....

.....

.....

.....

7 Calculate the pH of a buffer solution made by dissolving 0.20 mol of benzoic acid and 0.010 mol of sodium benzoate to make 1.0 dm^3 of solution.
(K_a for benzoic acid = $6.4 \times 10^{-5} \text{ mol dm}^{-3}$)

8 Explain how the HCO_3^- ion acts as a buffer.

.....

.....

.....

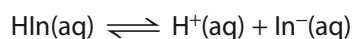
.....

.....

Chapter 11 Acids, bases and buffers

9 Sketch a pH titration curve for the addition of a weak alkali to a strong acid.

10a Explain how the following indicator would work:



Yellow

Blue

.....

.....

.....

.....

.....

b If the indicator has a $\text{p}K_{\text{In}}$ value of 4.9, for which type of titration could it be used?

.....

11 Define enthalpy of neutralisation.

.....

.....

.....

12 Explain why the value of the enthalpy of neutralisation of a weak acid and a strong base is less than the enthalpy of neutralisation of a strong acid and a strong base.

.....

.....

.....

.....

.....