

Chemistry 222
Chapter 18 - Acid-Base Equilibria
 Petrucci/8th Ed.

THINGS TO KNOW - THINGS TO DO

Like chapter 17 this is a very important chapter.

We will cover sections 18.1 through 18.4. Several handouts will accompany this chapter.

The SUMMARY of Chapter 18 on page 738 covers the important facts. You will be responsible for each term in the TERMS list on page 740.

You should know how to use the following equations: (from Chapter 17)

$$\text{pH} = -\log[\text{H}^+_{(\text{aq})}] \quad \text{pOH} = -\log[\text{OH}^-] \quad \text{pH} + \text{pOH} = 14.00 \text{ at } 25^\circ\text{C}$$

$$\text{pK}_a = -\log K_a \quad \text{pK}_b = -\log K_b \quad K_a \times K_b = K_w \text{ (for conjugate pairs)}$$

$$K_w = [\text{H}^+_{(\text{aq})}][\text{OH}^-] = 1.0 \times 10^{-14} \text{ M}^2 \text{ at } 25^\circ\text{C}$$

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For weak acid ionization¹: $\text{HA}_{(\text{aq})} \rightleftharpoons \text{H}^+_{(\text{aq})} + \text{A}^-_{(\text{aq})}$

$$K_a = \frac{[\text{H}^+][\text{A}^-]}{[\text{HA}]}$$

For weak base ionization (hydrolysis): $\text{B}_{(\text{aq})} + \text{H}_2\text{O}_{(\text{l})} \rightleftharpoons \text{HB}^+_{(\text{aq})} + \text{OH}^-_{(\text{aq})}$

$$K_b = \frac{[\text{HB}^+][\text{OH}^-]}{[\text{B}]}$$

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The Henderson-Hasselbalch Equation: (for buffers)

$$\text{pH} = \text{pK}_a + \log \frac{[\text{base}]}{[\text{acid}]}$$

these are conjugate acid-base pairs

At the equivalence point in a titration for monoprotic acids and monohydroxy bases:

$$M_{\text{acid}} \times V_{\text{acid}} = M_{\text{base}} \times V_{\text{base}}$$

There are several questions and problems posed through out the chapter, and you should answer *each one* of all the **Review Questions** on pages 740-741. Answers are given in the Appendix on page A-57.

The additional problems handed out in class will complete the chapter.

¹ Remember there are three types of hydrogen-containing weak acids (and two types of weak bases). The chemical equations given here are generic and apply to any weak acids or weak bases, respectively.