Name _____ Date _____ Class _____

19.3 STRENGTHS OF ACIDS AND BASES

Section Review

Objectives

- Define strong acids and weak acids
- Calculate an acid dissociation constant (K_a) from concentration and pH measurements
- Order acids by strength according to their acid dissociation constants (K_a)
- Order bases by strength according to their base dissociation constants (K_b)

Vocabulary

- strong acids
- weak acids
- acid dissociation constant (K_a)
- strong bases
- weak bases
- base dissociation constant (K_b)

Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

The strength of an acid or a base is determined by the ___1___ of the substance in solution. The acid dissociation constant, ___2___, is a quantitative measure of acid strength. A strong acid has a much ___3___ K_a than a weak acid. The K_a of an acid is determined from measured ___4___ values.

Hydrochloric acid and sulfuric acid are ___5___ ionized in solution and are ___6___ acids. Ethanoic acid, which is only about 1 percent ionized, is a ___7___ acid. Magnesium hydroxide and calcium hydroxide are strong ___8___.

Weak bases react with ___9___ to form the hydroxide ion and the conjugate ___10___ of the base. Concentration in solution does not affect whether an acid or a base is ___11___ or weak.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

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Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

_____ **12.** Acids are completely dissociated in aqueous solution.

_____ **13.** Diprotic acids lose both hydrogens at the same time.

_____ **14.** Acid dissociation constants for weak acids can be calculated from experimental data.

_____ **15.** Bases react with water to form hydroxide ions.

Part C Matching

Match each description in Column B to the correct term in Column A.

Column A	Column B
_____ **16.** strong acids	**a.** ratio of the concentration of the dissociated (or ionized) form of an acid to the concentration of the undissociated acid
_____ **17.** weak acids	**b.** bases that dissociate completely into metal ions and hydroxide ions in aqueous solution
_____ **18.** acid dissociation constant (K_a)	**c.** acids that ionize completely in aqueous solution
_____ **19.** strong bases	**d.** bases that do not dissociate completely in aqueous solution
_____ **20.** weak bases	**e.** acids that are only partially ionized in aqueous solution
_____ **21.** base dissociation constant (K_b)	**f.** ratio of concentration of conjugate acid times concentration of hydroxide ion to the concentration of conjugate base

Part D Problem

Answer the following in the space provided.

22. A 0.35*M* solution of a strong acid, HX, has a $[H^+]$ of 4.1×10^{-2}. What is the value of K_a for this acid?