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. _____

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