



Name: \_\_\_\_\_

ID: A

- \_\_\_\_\_ 11. In a neutral solution, the  $[H^+]$  is \_\_\_\_.
- a.  $10^{-14} M$
  - b. zero
  - c.  $1 \times 10^7 M$
  - d. equal to  $[OH^-]$
- \_\_\_\_\_ 12. What is the best description for a solution with a hydroxide-ion concentration of  $1 \times 10^{-4} M$ ?
- a. acidic
  - b. basic
  - c. neutral
  - d. The answer cannot be determined.
- \_\_\_\_\_ 13. What is pH?
- a. the negative logarithm of the hydrogen ion concentration
  - b. the positive logarithm of the hydrogen ion concentration
  - c. the negative logarithm of the hydroxide ion concentration
  - d. the positive logarithm of the hydroxide ion concentration
- \_\_\_\_\_ 14. Which type of solution is one with a pH of 8?
- a. acidic
  - b. basic
  - c. neutral
  - d. The type varies, depending on the solution.
- \_\_\_\_\_ 15. Which of these solutions is the most basic?
- a.  $[H^+] = 1 \times 10^{-2} M$
  - b.  $[OH^-] = 1 \times 10^{-4} M$
  - c.  $[H^+] = 1 \times 10^{-11} M$
  - d.  $[OH^-] = 1 \times 10^{-13} M$
- \_\_\_\_\_ 16. What characterizes a strong acid or base?
- a. polar covalent bonding
  - b. complete ionization in water
  - c. ionic bonding
  - d. presence of a hydroxide or hydrogen ion
- \_\_\_\_\_ 17. With solutions of strong acids and strong bases, the word *strong* refers to \_\_\_\_.
- a. normality
  - b. molarity
  - c. solubility
  - d. degree of ionization
- \_\_\_\_\_ 18. Which of the following pairs consists of a weak acid and a strong base?
- a. sulfuric acid, sodium hydroxide
  - b. acetic acid, ammonia
  - c. acetic acid, sodium hydroxide
  - d. nitric acid, calcium hydroxide
- \_\_\_\_\_ 19. A base has a  $K_b$  of  $2.5 \times 10^{-11}$ . Which of the following statements is true?
- a. This is a concentrated base.
  - b. This base ionizes slightly in aqueous solution.
  - c. This is a strong base.
  - d. An aqueous solution of this base would be acidic.
- \_\_\_\_\_ 20. The process of adding a known amount of solution of known concentration to determine the concentration of another solution is called \_\_\_\_.
- a. neutralization
  - b. hydrolysis
  - c. titration
  - d. buffer capacity

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- \_\_\_\_\_ 21. In a titration, when the number of moles of hydrogen ions equals the number of moles of hydroxide ions, what is said to have happened?
- The equivalence point has been reached.
  - The end point has been reached.
  - The point of neutralization has been reached.
  - The titration has failed.
- \_\_\_\_\_ 22. What kind of ion is contained in salts that produce an acidic solution?
- a positive ion that releases a proton to water
  - a negative ion that releases a proton to water
  - a positive ion that attracts a proton from water
  - a negative ion that attracts a proton from water

### Short Answer

23. If the  $[H^+]$  in a solution is  $1 \times 10^{-1}$  mol/L, what is the  $[OH^-]$ ?
24. If the pH is 9, what is the concentration of hydroxide ion?

### Numeric Response

25. If the hydrogen ion concentration is  $10^{-7} M$ , what is the pH of the solution?
26. If the hydroxide ion concentration is  $10^{-10} M$ , what is the pH of the solution?
27. If  $[OH^-] = 1 \times 10^{-4} M$ , what is the pH of the solution?
28. What is the pH of a solution with a concentration of  $0.01 M$  hydrochloric acid?