

## 14.1

## HYDROGEN IONS AND ACIDITY

## Section Overview

## Objectives

1. Identify conjugate acid-base pairs of ions, acids, or hydroxides and of aqueous concentrations.
2. Calculate hydroxide and hydronium ion concentrations and pH values and vice versa for a given pH.
3. Calculate the pH of weak acid solutions.

## Vocabulary

- |                   |                                |                                |
|-------------------|--------------------------------|--------------------------------|
| 1. autoionization | 2. conjugate acid-base pair    | 3. pH                          |
| 4. hydronium ion  | 5. hydronium ion concentration | 6. hydronium ion concentration |
|                   | 7. hydroxide ion               | 8. $pK_a$                      |

## Key Equations

- |   |                         |
|---|-------------------------|
| 1. $[H_3O^+][OH^-] = 1.0 \times 10^{-14}$ (at 25°C) | 2. $pH = -\log[H_3O^+]$ |
| 3. $pH = -\log[H_3O^+]$                             | 4. $pOH = -\log[OH^-]$  |

## Part A: Completion

Use the appropriate number to identify the relationship of the conjugate acid-base pair indicated in the second step. Each correct response receives a score of one. Complete any missing answers.

1. What product is the \_\_\_\_\_ of a weak hydroxide ion and a hydronium ion? \_\_\_\_\_ of the conjugate acid-base pair.
2. \_\_\_\_\_ of a weak acid and a hydroxide ion.
3. \_\_\_\_\_ of a weak acid and a hydroxide ion.
4. \_\_\_\_\_ of a weak acid and a hydroxide ion.
5. \_\_\_\_\_ of a weak acid and a hydroxide ion.
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16. \_\_\_\_\_ of a weak acid and a hydroxide ion.
17. \_\_\_\_\_ of a weak acid and a hydroxide ion.
18. \_\_\_\_\_ of a weak acid and a hydroxide ion.
19. \_\_\_\_\_ of a weak acid and a hydroxide ion.
20. \_\_\_\_\_ of a weak acid and a hydroxide ion.

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# 19 2 Hydrogen Ions And Acidity Answer Key

**Philip Bovier Hawk, Olaf Bergeim**



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