

## 19.2

## HYDROGEN IONS AND ACIDITY

## Section Review

## Objectives

1. Calculate  $K_a$  and  $K_b$  for weak acids and bases, and vice versa for weak acids and bases.
2. Calculate  $K_a$  and  $K_b$  for weak acids and bases, and vice versa for weak acids and bases.
3. Calculate the pH of weak acids and bases.

## Vocabulary

- |                 |                                      |                 |
|-----------------|--------------------------------------|-----------------|
| acid            | acid dissociation constant ( $K_a$ ) | acid ionization |
| acidic solution | acidic solution                      | acidic solution |
| acidic solution | acidic solution                      | acidic solution |

## Key Equations

- |   |  |
|---|--|
| $K_a = \frac{[H^+][A^-]}{[HA]}$ (Equation 19.1) | $K_b = \frac{[OH^-][HB^+]}{[B]}$ (Equation 19.2) |
|---|--|

## Part A Completion

Write the appropriate formula for each of the following acids, bases, and salts, showing dissociation reactions, and calculate the pH of each solution.

1. Acetic acid,  $CH_3COOH$ ,  $K_a = 1.8 \times 10^{-5}$
2. Hydrofluoric acid,  $HF$ ,  $K_a = 6.6 \times 10^{-4}$
3. Hydrocyanic acid,  $HCN$ ,  $K_a = 4.9 \times 10^{-10}$
4. Hydrobromic acid,  $HBr$ ,  $K_a = 1.0 \times 10^3$
5. Hydrochloric acid,  $HCl$ ,  $K_a = 1.0 \times 10^7$
6. Hydroiodic acid,  $HI$ ,  $K_a = 1.0 \times 10^9$
7. Hydroperchloric acid,  $HClO_4$ ,  $K_a = 1.0 \times 10^{10}$
8. Hydroperbromic acid,  $HBrO_4$ ,  $K_a = 1.0 \times 10^{10}$
9. Hydroperchloric acid,  $HClO_4$ ,  $K_a = 1.0 \times 10^{10}$
10. Hydroperbromic acid,  $HBrO_4$ ,  $K_a = 1.0 \times 10^{10}$
11. Hydroperchloric acid,  $HClO_4$ ,  $K_a = 1.0 \times 10^{10}$
12. Hydroperbromic acid,  $HBrO_4$ ,  $K_a = 1.0 \times 10^{10}$
13. Hydroperchloric acid,  $HClO_4$ ,  $K_a = 1.0 \times 10^{10}$
14. Hydroperbromic acid,  $HBrO_4$ ,  $K_a = 1.0 \times 10^{10}$
15. Hydroperchloric acid,  $HClO_4$ ,  $K_a = 1.0 \times 10^{10}$
16. Hydroperbromic acid,  $HBrO_4$ ,  $K_a = 1.0 \times 10^{10}$
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19. Hydroperchloric acid,  $HClO_4$ ,  $K_a = 1.0 \times 10^{10}$
20. Hydroperbromic acid,  $HBrO_4$ ,  $K_a = 1.0 \times 10^{10}$

1. Acetic acid,  $CH_3COOH$
2. Hydrofluoric acid,  $HF$
3. Hydrocyanic acid,  $HCN$
4. Hydrobromic acid,  $HBr$
5. Hydrochloric acid,  $HCl$
6. Hydroiodic acid,  $HI$
7. Hydroperchloric acid,  $HClO_4$
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9. Hydroperchloric acid,  $HClO_4$
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17. Hydroperchloric acid,  $HClO_4$
18. Hydroperbromic acid,  $HBrO_4$
19. Hydroperchloric acid,  $HClO_4$
20. Hydroperbromic acid,  $HBrO_4$

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**Advances in Inorganic Chemistry and Radiochemistry**, 1961-01-01 Advances in Inorganic Chemistry and Radiochemistry

Textbook of Pulmonary and Critical Care Medicine Vols 1 and 2 SK Jindal, PS Shankar, Suhail Raoof, Dheeraj Gupta, 2011-01-31 This book published in two volumes Both volume divided in twenty three sections all sections and chapters are most important The Textbook of Pulmonary and Critical Care Medicine also offers a unique exposure to the problems in many parts of the world Tuberculosis the number one treatable condition has been extensively covered and special topics such as multi drug resistance directly observed therapy TB prevention nonpharmacologic approaches and extrapulmonary tuberculosis are particularly relevant Many countries are facing a growing burden of noncommunicable respiratory diseases They have become the second leading cause of death after injuries and their impact on indirect costs such as loss of work and home productivity is enormous These problems are addressed and measures of prevention such as smoking cessation are included Other special challenges including topics such as indoor and outdoor air pollution climate change poisoning with pesticides snakebite toxicity pulmonary manifestations of tropical infections and industrial accidents such as the tragedy seen in Bhopal Madhya Pradesh with methyl isocyanate have been well covered However as globalization flattens the playing field and countries leap to industrialization cultural beliefs natural resources climate and geography have slowed the pace of development in many parts of the world Poverty leads to malnutrition homelessness lack of education and poor access to health care Overcrowded cities and rural underdevelopment are other challenges that impact health in the various parts of the world Moreover epidemics of HIV drug abuse and smoking

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