

17 • Acid-Base Equilibrium

QUIZ YOURSELF WORKSHEET

Work out these problems. Form groups at the lab tables and go over the answers. Make certain everyone understands each problem.

1. You place 2.0 mol of hydrogen iodide in a 1.0-L container at a certain temperature. The compound partially dissociates according to the equation $2 \text{HI}(\text{g}) \rightleftharpoons \text{H}_2(\text{g}) + \text{I}_2(\text{g})$. If 22% of the HI has dissociated at equilibrium, calculate K_c .

2. A saturated solution of milk of magnesia, $\text{Mg}(\text{OH})_2$, has a pH of 10.5. What is the hydronium ion concentration of the solution? What is the hydroxide ion concentration? Is the solution acidic or basic?

3. Calculate the pH of the following solutions:
 - a) $2.8 \times 10^{-3} \text{ M HCl}$
 - b) $2.8 \times 10^{-5} \text{ M HCl}$
 - c) $2.8 \times 10^{-8} \text{ M HCl}$

4. Dissolving ammonium bromide in water gives an acidic solution. Write a balanced equation showing how this can occur.

5. What are the equilibrium concentrations of hydronium ion, acetate ion, and acetic acid in a 0.20 M aqueous solution of acetic acid? What is the pH of the solution? $K_a = 1.8 \times 10^{-5}$
6. Calculate the hydroxide ion concentration, hydronium ion concentration, and pH for a 0.015 M solution of the salt sodium acetate, $\text{NaC}_2\text{H}_3\text{O}_2$.