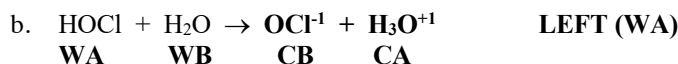
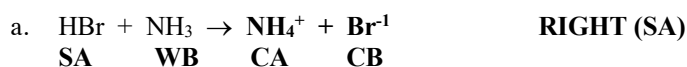


Answers

1. For the equilibrium $2 \text{CO}_{(g)} + \text{O}_{2(g)} \rightleftharpoons 2 \text{CO}_{2(g)}$ where $\Delta H < 0$, how will each of the following affect the equilibrium? Circle the correct answer. (4 points)

- a. Oxygen is added to the system. right left no change
- b. The reaction mixture is heated. right left no change
- c. The pressure of the reaction mixture is increased. right left no change
- d. CO_2 is removed from the system. right left no change

2. Complete and balance the following acid-base reactions. Identify the acid, base, conjugate acid and conjugate base in each reaction. Predict whether the equilibrium lies predominantly to the left or the right. (6 points)



3. What is the pH of a 0.116 M $\text{Mg}(\text{OH})_2$ solution? Assume $\text{Mg}(\text{OH})_2$ is a strong base. (3 points)

pH = 13.365

4. My soft drink has a pH of 6.22. Is the soft drink acidic, alkaline or neutral? Calculate the hydronium and hydroxide ion concentration in the soft drink. (3 points)

Acidic!

$[\text{H}_3\text{O}^+] = 6.0 \times 10^{-7} \text{ M}$

$[\text{OH}^-] = 1.7 \times 10^{-8} \text{ M}$

5. Benzoic acid, $\text{C}_6\text{H}_5\text{COOH}$, is a weak acid ($K_a = 6.28 \times 10^{-5}$). If I dissolve 1.22 g of $\text{C}_6\text{H}_5\text{COOH}$ in enough water to make 500. mL of solution, what is the resulting pH of the solution? (4 points)

pH = 2.951