CH 223
Sample Quiz #2 Name: _____ Lab Section: _____
Answers

---

1. For the equilibrium $\mathbf{2\ CO_{(g)} + O_{2(g)} \rightleftharpoons 2\ CO_{2(g)}}$ where $\mathbf{\Delta H < 0}$, 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)

   a. $HBr + NH_3 \rightarrow \mathbf{NH_4^+ + Br^{-1}}$ **RIGHT (SA)**
   SA WB CA CB

   b. $HOCl + H_2O \rightarrow \mathbf{OCl^{-1} + H_3O^{+1}}$ **LEFT (WA)**
   WA WB CB CA

3. What is the pH of a 0.116 M $Mg(OH)_2$ solution? Assume $Mg(OH)_2$ 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!
   $[H_3O^+] = 6.0 \times 10^{-7}$ M
   $[OH^{-1}] = 1.7 \times 10^{-8}$ M

5. Benzoic acid, C_6H_5COOH, is a weak acid ($K_a = 6.28*10^{-5}$). If I dissolve 1.22 g of C_6H_5COOH in enough water to make 500. mL of solution, what is the resulting pH of the solution? (4 points)

   pH = 2.951