

**5 Point Bonus for all Quizzes Submitted by 4:00 PM Friday, December 2**

Complete the following individually. You may use your textbook and notes, but may not receive assistance from your classmates or anyone other than Dr. Lamp. *This signed statement must accompany the completed assignment.* By signing below, you certify that you completed the problems in accordance with these rules. No credit will be given to unsigned papers. Staple any additional sheets prior to turning the assignment in.

Signature \_\_\_\_\_ Date \_\_\_\_\_

Complete the following problems on separate paper and **staple the pages** to this sheet **write your final answers on this page**. **You must show your work to receive full credit.** Show your answers to the correct number of significant figures with the correct units.

1. A 0.431 g sample of  $\text{HCl(g)}$  was placed in a 625 mL reaction vessel at a 862K and allowed to dissociate to  $\text{H}_2$  and  $\text{Cl}_2$ . When equilibrium is reached between  $\text{HCl(g)}$ ,  $\text{H}_2(\text{g})$  and  $\text{Cl}_2(\text{g})$ , 0.0414 g  $\text{Cl}_2$  is present. What is the  $K_c$  for the reaction at this temperature?

**Answer:  $K_c =$**

2. Carbonyl bromide,  $\text{COBr}_2(\text{g})$ , decomposes to  $\text{CO(g)}$  and  $\text{Br}_2(\text{g})$  with an equilibrium constant,  $K_c$ , of 0.190 at  $73^\circ\text{C}$ . If a 0.0150 mol sample of  $\text{COBr}_2$  is heated in a 2.50 L flask until equilibrium is attained, what will be the concentrations of all  $\text{COBr}_2$ ,  $\text{CO}$ , and  $\text{Br}_2$  at equilibrium?

**Answer:  $[\text{COBr}_2] =$**

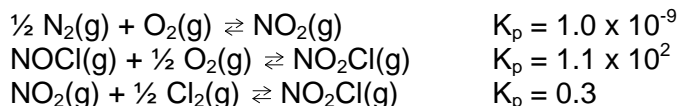
**$[\text{CO}] =$**

**$[\text{Br}_2] =$**

3. In the reaction  $\text{CO(g)} + \text{H}_2\text{O(g)} \rightleftharpoons \text{CO}_2(\text{g}) + \text{H}_2(\text{g})$ ,  $K_c = 31.4$  at 588 K. If 10.1 g of each reactant and product are brought together in a 1.00 L reaction vessel at 588 K, how many grams of  $\text{H}_2\text{O}$  will be present at equilibrium?

**Answer: mass  $\text{H}_2\text{O} =$**

4. Determine  $K_c$  for the reaction:  $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightleftharpoons 2\text{NOCl(g)}$  from the following data at 298K:



**Answer:  $K_c =$**