

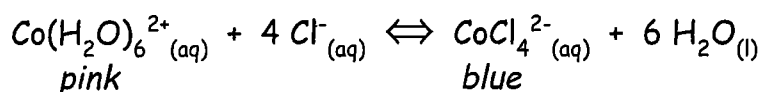
RSS Chemistry 12

Lab - Le Chatelier's Principle

NAME _____

DATE _____ BLOCK _____

Objectives: In this lab investigation, you will subject the following equilibrium system to various stresses and observe the effects on the equilibrium.



Procedure: A solution of the equilibrium system above has been prepared for you. The system is quite acidic so caution in handling is necessary. Wash any spills immediately with plenty of water and contact the teacher.

1. Obtain 5 medium sized test tubes and add approximately 5 mL of the equilibrium solution to each tube.
2. To the first tube, add approximately 2 mL of 12 M HCl. **Do this in the fume hood!! CAUTION:** This is the strongest HCl available. BE CAREFUL.
3. To the second tube, add 5 mL of distilled water
4. To the third tube, add 2 mL of 0.1 M AgNO₃. **CAUTION:** Silver nitrate will stain almost anything that it is spilled on, including your skin and clothes.
5. Place the fourth tube in a hot water bath and the fifth tube into an ice water bath.

Observations: Write a brief description of what you observe happening in each stressed tube. The system starts off as a combination of "pink" and "blue" which is a purple colour.

Procedure Step #2 (tube #1):

Procedure Step #3 (tube #2):

Procedure Step #4 (tube #3):

Procedure Step #5 (tube #4):

Procedure Step #5 (tube #5):

Analysis of Data: In each of the test tubes, identify
(a) the direction in which the equilibrium was shifted (right or left)
(b) your reasoning for the shift in equilibrium.

Procedure Step #2 (tube #1):

Procedure Step #3 (tube #2):

Procedure Step #4 (tube #3):

Procedure Step #5 (tube #4):

Procedure Step #5 (tube #5):

Questions:

1. From your analysis of tube #4 and #5, is the forward direction of this equilibrium system exothermic or endothermic? Explain your reasoning.
2. Predict how the addition of sodium chloride - NaCl - would affect the equilibrium. (What shift would result and what colour change would you expect?)
3. Complete the graph below based on your observations. At t_1 , additional Cl^- ion is added and at t_2 , the temperature of the system is increased.

