

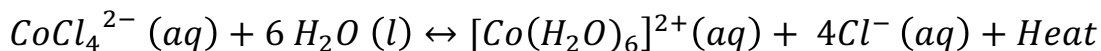
Name: \_\_\_\_\_ Per \_\_\_\_\_

## Chemical Equilibrium

### Honors Lab

#### Introduction:

In this lab you will be observing reactions according to the following equation. In the following equation  $CoCl_4^{2-}$  is observed to be blue, and  $[Co(H_2O)_6]^{2+}$  is observed to be pink.



Blue

Pink

#### Goal:

In this lab you will design a way to determine three ways to change the color of the solution back and forth. When you are designing each experiment you may only test one variable at a time. **You must get each experiment approved by your instructor before you can begin using any of the chemicals!** After your procedure is approved you will need to record all of your findings and then come up with a conclusion about each way to manipulate the color of the solution.

#### Safety:

$AgNO_3$  (Silver Nitrate) can burn your skin and also it will stain your skin a brownish-black color. Please be careful when handling the silver nitrate and your goggles must be worn at all times.

#### Test 1:

Changing variable: \_\_\_\_\_ Teacher Approval \_\_\_\_\_

Procedure:

Results:

#### Conclusion:

We can conclude \_\_\_\_\_ changes the color of the reaction to \_\_\_\_\_ because \_\_\_\_\_.  
(data/observations)

Explanation/Analysis of Experiment: (Explain your conclusion, why did the color shift?)

Name: \_\_\_\_\_ Per \_\_\_\_\_

**Test 2:**

Changing variable: \_\_\_\_\_ Teacher Approval \_\_\_\_\_

Procedure:

Results:

**Conclusion:**

We can conclude \_\_\_\_\_ changes the color of the reaction to \_\_\_\_\_ because \_\_\_\_\_.

Changing variable

Color

Results  
(data/observations)

Explanation/Analysis of Experiment: (Explain your conclusion, why did the color shift?)



Name: \_\_\_\_\_ Per \_\_\_\_\_

**Additional Assessment (Demo to be done by your instructor)**

*Predict:* What do you think will happen to the solution when your instructor adds concentrated 6M HCl?

*Observations:*

*Explain the the color change:*

**Additional Questions:**

1. What is an equilibrium?
  
2. How can an equilibrium be altered?
  
3. When you added  $\text{AgNO}_3$  to your solution you observed a shift in equilibrium and the formation of a precipitate. What was the precipitate that formed?
  
3. What problems did you encounter in your experiments? List at least two possible sources of error, and explain each source.

**Discussion**

Write 1 paragraph about your experiment on a separate sheet of paper. Identify the three factors that you learned disturbed equilibrium. Explain how each of these factors disturbed the equilibrium and support your claim with evidence from your experiments.