

## LeChatlier's Principle Virtual Lab

Here is the [link](#):

<http://www.harpercollege.edu/tm-ps/chm/100/dgodambe/thedisk/equil/equil.htm>

Here are the instructions:

### LeChatelier's Principle Virtual Lab

Set up paper like this:

**Equation**

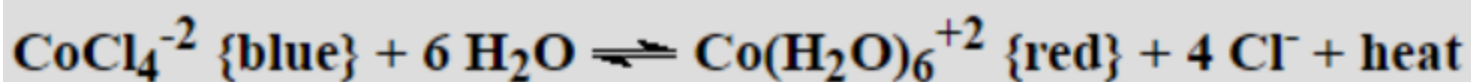
- (a) Imposed change:
  - (b) Observations:
  - (c) Chemical explanation:
- 

Complete a section for each change associated with the cobalt system and the iron thiocyanate system.

Complete one section for your choice of one change each associated with the ammonium system, the chromate system, the nitrogen dioxide system, and the copper sulfate system.

Answer the post lab questions.

Here is an example:



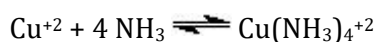
**(a) Add AgNO<sub>3</sub>**

**(b) Turned from purple to pink**

**(c) Equilibrium shifted to the right because [Cl<sup>-1</sup>] (which is on the right side) was decreased by adding Ag<sup>+1</sup>**

**Here are the post-lab questions:**

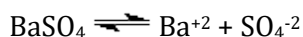
1. Predict what would happen if the ammonium system described in the experiment was heated.
2. Consider the following equilibrium.



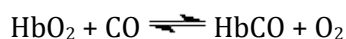
The copper ion in solution is light blue. The Cu(NH<sub>3</sub>)<sub>4</sub><sup>+2</sup> ion is a deep blue. The tube on the left contains only copper ions. Identify what chemical was added to produce the results shown in the center tube. Identify what chemical may have been added to the center tube to produce the results shown in the right tube.



3. The barium ion is toxic to humans. However, barium sulfate is commonly used as an image enhancer for gastrointestinal x-rays. What does this imply about the position of the equilibrium shown below.



4. Hemoglobin (Hb) and oxygen gas form a complex (HbO<sub>2</sub>) that carries oxygen throughout the human body. Unfortunately, carbon monoxide also binds to hemoglobin so that an equilibrium is established. Carbon monoxide poisoning occurs when the concentration of HbO<sub>2</sub> in the blood is reduced.



The first aid for a person suffering from carbon monoxide poisoning is to (1) remove them to an area of fresh air, and (2) administer oxygen. Using the principles of equilibrium, explain how each of these helps to restore the HbO<sub>2</sub> concentration.