**Chem 12: Lab 2A – Effect of Concentration on Equilibrium Systems**

*You will create a formal lab report for this experiment*

**Background info / Pre-Lab Thinking**

In this experiment, we will examine the following reaction

Fe+3(aq) + SCN- (aq)  FeSCN+2 (aq)

*Yellow colourless red*

The reaction acts like a synthesis, where two smaller ions combine to create a complex ion [thiocyanatoiron(III)]. Since it is an equilibrium system, some reactants and some products will be present at any given time.

**Question:**

How will changes in the concentrations of each species above affect the equilibrium   
 position? (i.e. Will a shift occur? If so, which way?)

**Considerations:**

-Which substances above can we manipulate (“stress”)?

-What can we do to increase the concentrations of these substances?

-What can we do to decrease the concentrations of these substances?

-How can we control this experiment? (manipulate only one substance at a time?)

-What can we observe that will tell us how the equilibrium has shifted?

**Starting Procedure:**

1. Obtain a graduated cylinder. Measure 1.0 mL of 0.2M FeCl3 and observe it.
2. Pour the FeCl3 into a 250mL beaker.
3. Rinse the graduated cylinder thoroughly, then use it to measure 1.0 mL of 0.2M KSCN. Observe the KSCN, then add it to the FeCl3 in the beaker. Observe the changes.
4. This mixture is very dark, and it will be difficult to see subtle changes in its colour. To make things easier, add water until the solution is light orange. This will be your starting solution for all further manipulations.
5. We will brainstorm a procedure together in class to address the lab question above.  
   You will add this piece, in your own words, and put it into your lab report.

**Data & Analysis:**

You will need to create a data table that summarizes observations of:

-the control substance  
-each stress you introduced, and the effects of that stress (shift 🡪, 🡨, or none).

**Conclusion:** Answer the lab question, using Claim/Evidence/Reasoning.   
 You may find it easier to make several claims (ex: when we increase [reactants], we see…)  
 Evidence should connect what you saw to the direction of the shift. How do you know?

Reasoning should connect to collision theory and fwd/reverse reaction rates.   
 WHY are these shifts taking place? If no shifts occur, explain why not.