

SYLLABUS  
for  
Analysis of Equilibrium Systems Laboratory  
Chem 2041  
Tuesday Afternoon and Wednesday Afternoon

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Office Hours: Mon 3:00-4:00pm and Thursday 12:00-1:00pm

The expectations for this lab are as follows:

1. **NO LATE LAB REPORTS.**
2. PRELAB Questions will be collected at the top of the hour no exceptions. Please nicely answer your questions on a separate sheet of paper to be handed in.
3. PRELAB Write-ups in lab notebooks will be checked at the top of the hour during the collection of prelab questions. This must be done to receive full points; I will take 10 points off that experiment lab report grade if this is not done. An example of how to write your lab report is given. This is just a guide and different formats can be used as long as everything is included. Please use a carbon copy lab notebook that can be purchased at the book store. You will turn in your carbon copies with your typed lab report.
4. LAB REPORTS will be typed and a complete description of format is given in your black binders. Be thorough with your discussions and be sure to answer all questions in the experiment. This includes questions within the experiment, not just the additional questions. Watch Blackboard for highlights and important things to include in your lab report. The LAB REPORTS will be due as follows.

LAB SECTION	REPORT DUE
Tuesday Afternoon	Thursday at 4 pm
Wednesday Afternoon	Friday at 4 pm

Turn the reports into my mail box, Cullen Jones, located in the Chemistry Department Office, Olin 204. I will empty the box at exactly 4 pm, so don't be late.

5. MOST OF ALL, I am here to help you so please ask me anything that will help you understand what is going on in the lab. There is no such thing as a "BAD QUESTION".

Sample Outline for Laboratory Notebook

Date: \_\_\_\_\_

GTA Initials \_\_\_\_\_

Page # \_\_\_\_\_

**Comment:** GTA will initial your lab notebook at the end of each lab. DON'T FORGET TO HAVE IT INITIALED

**Title of Experiment:** Determination of the Equilibrium Constant for Formation of  $\text{Fe}(\text{SCN})^{2+}$

**Procedure:**

Pre-Lab write-up (date: 1-2-3)

1. Rinse burets w/ distilled water
2. Rinse 1<sup>st</sup> buret w/ 5ml 0.3 HNO<sub>3</sub>, then fill with HNO<sub>3</sub>. (Label buret HNO<sub>3</sub>).
3. Rinse 2<sup>nd</sup> buret w/ 5ml Fe<sup>3+</sup> sol., then fill with Fe<sup>3+</sup>. (Label Fe<sup>3+</sup>).
4. Rinse 3<sup>rd</sup> buret w/ 5ml SCN<sup>-</sup>, fill with SCN<sup>-</sup>. (Label SCN<sup>-</sup>).
5. Label 10 test tubes
6. Prepare 10 solutions following table 1.

Table 1

Test Tube	ml of NaSCN	ml of Fe <sup>3+</sup>	ml of 0.3 M HNO <sub>3</sub>
1	0	15.00	5.00
2	5.00	0.00	15.00
3	5.00	0.50	14.50
4	5.00	1.00	14.00
5	5.00	1.50	13.50
6	5.00	2.00	13.00
7	5.00	2.50	12.50
8	5.00	10.00	5.00
9	5.00	12.50	2.50
10	5.00	15.00	0.00

Actual Measurements and Observations

Date: (day of lab)

**Comment:** Pre-lab is done before coming to lab. This includes everything **not in italics**.

LEAVE THIS AREA FOR COMMENTS AND OBSERVATIONAL NOTES.

eg. A SPILL OCCURRED AND HAD TO REDO

Test Tube	ml of NaSCN	Buret #3 ml	ml of Fe <sup>3+</sup>	Buret #4 ml	ml of 0.3 M HNO <sub>3</sub>	Buret #5 ml
1	0		14.99	50.00 - 35.01	5.00	50.00 - 45.00
2	5.03	50.00 - 44.97	0.00		15.21	etc
3	4.99	etc	0.50	etc	14.25	etc
4	5.00	etc	0.99	etc	13.99	etc
5	5.00	etc	1.54	etc	13.55	etc
6	4.99	etc	2.10	etc	13.00	etc
7	4.89	etc	2.50	etc	12.50	etc
8	5.00	etc	10.00	etc	4.99	etc
9	5.00	etc	12.56	etc	2.50	etc
10	5.00	etc	15.00	etc	0.00	

**Comment:** Record values that were actually measured to nearest significant figure. Also record buret readings for each dispensing of solution.

7. Stopper each test tube and Mix. Note color change.

RECORD OBSERVATIONS OF EACH TEST TUBE. IT CAN BE IN TABULAR FORM

8. Calculate initial concentrations enter values in table 2

SHOW AT LEAST ONE COMPLETE CALCULATION

9. Measure Visible Spectrum of each solution.

10. Compare tubes 8,9,and 10. Answer Questions ???????

RECORD YOUR COMPARISON and ANSWERS HERE

11. Choose a wavelength to analyze your data. Explain reasoning.

WAVELENGTH and REASONING

**Comment:** These questions will also be included in your typed lab report. It is good to answer them immediately to make it easier later. ANY SENTENCE ENDING WITH ?????? WILL BE INCLUDED IN LAB REPORT.

**Comment:** This will also be included in your lab report so the more you explain now the better your lab report will be.

Table 2

Test Tube	ml of NaSCN	ml of Fe <sup>3+</sup>	ml of 0.3 M HNO <sub>3</sub>	Initial [SCN <sup>-</sup> ] (M)	Initial [Fe <sup>3+</sup> ] (M)	abs
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

**Calculations and Balanced Equations:**

This section of the lab notebook will include all individual examples of calculations for each equation. For example this particular lab will include all equations described 1-5 in the Calculations section. This will be accepted as the sample calculations in the typed lab report if it is nice and legible. BE SURE TO USE SIGNIFICANT FIGURES AND UNITS ON ALL #s. It is highly recommended to complete this as soon as possible especially if the GTA and UTA are available for questions. The more detailed you are in the lab notebook the easier it will be to write the lab report and the better your grade will be.

**Comment:** Table would be made in the pre-lab and filled in during the lab day. BE AWARE OF SIGNIFICANT FIGURES AND PROPER UNITS.

WHEN FINISHED WITH LAB IN NOTEBOOK SIGN AND DATE IT FOR COMPLETENESS