Experiment 7b
The Final Analysis of
those Stupid Green Crystals We Made
Like a Million Years Ago in Lab
Part 3: Spectrophotometric Determination of Iron Content
CH 204 Spring 2009
Dr. Brian Anderson



Last Week

Made standard solutions from a stock solution Fun with dilutions!

Spectrophotometry — Beer's Law

'Tis the season...

Throw a pair of sweat pants in your lab drawer if you're going to be wearing shorts around campus in warmer weather.

	This week
Convert	our green crystals into an orange solution, Fe(phen)3 ²⁺ ,
then	use a spectrophotometer to measure how much light this
	solution absorbs at 510 nm.
	nolar absorptivity determined from the calibration curve to te how much Fe(phen)3 ²⁺ is in our final sample solution.
Back-calc	ulate through the sample dilutions to determine how much
	Fe was in the original sample.



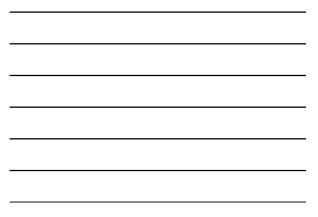
	Lab Procedure, Part 1
	Weigh out 0.15 g of green crystals and dissolve in deionized water. (Do this right there in the weighing boat.) Transfer the dissolved sample to a 25 mL volumetric flask.
2	. Add 8 mL of 6 M H_2SO_4 , and fill to the line with deionized water using a disposable pipette.
	Your sample is now dissolved in 25 mL of solution.



Part 1, continued...

Pipette 5 mL into a 30 mL beaker, add about 10 mL deionized water, heat and stir. Start the reaction right away!
 Add KMnO₄ dropwise until the solution turns pink. (Around 30-50 drops.) Yellow → colorless → pink.
 Transfer the pink solution to a 25 mL volumetric flask and let it cool on the dark part of the lab bench.
 There is no step eight.
 Fill the volumetric flask to the mark using deionized water. The sample has now been diluted 1 to 5 from the original concentration.

	On to Part 4
1.	Pipette <mark>5 mL</mark> of your sample from part 1.9 into a <mark>25 mL</mark> volumetric flask.
	The sample has now been diluted 1 to 5 TWICE, or 1 to 25.
	Add 1 mL of hydroxylamine, NH ₂ OH
	2 mL sodium acetate, and
	8 mL 1,10 phenanthroline
	Fill to the mark with PHENANTHROLINE!
	Let it sit for 20 minutes.



	-		ween your lowest
d highest stand	lard from la	ist week.	
t's too high, d	o another d	ilution and	l test it again.
RECO)rd <u>All</u> d	ILUTION	S!
ord <u>All</u> Me	ASURED A	BSORBA	NCE VALUES!
Make all of y	your dilutior	ns <mark>5 ml</mark> to	25 ml.
i	it's too high, d RECC CORD <u>ALL</u> ME	it's too high, do another d RECORD <u>ALL</u> D CORD <u>ALL</u> MEASURED A	nd highest standard from last week. it's too high, do another dilution and RECORD <u>ALL</u> DILUTIONS CORD <u>ALL</u> MEASURED ABSORBA Make all of your dilutions 5 ml to



"Triplicate" analysis

Once you've got an absorbance reading within the range of your standards, dump the cuvette, rinse it twice with your solution, and make a second absorbance measurement. Then do this again and make a third absorbance measurement. Record all three absorbances in the table on page 59.

Don't forget about those dilutions

When you determine the concentration of your sample from the graph, remember that this is the final concentration after all those dilutions. You have to back-calculate through all the dilutions you made in order to figure out the original concentration you started with.

If all your dilutions are 5 to 25 ml, your total dilution factor will be 5^x, where x is the number of dilutions you made.

	Report buried in the procedure
In I	Part 4 of the experimental procedure, steps 4 $-$ 9
4	are actually part of the REPORT, not part of the
e	experiment.
The	ese calculations are covered on the cheat sheet from
	Dr. Leytner. Don't forget to do them!
Un	known Summary Sheet includes oxalate data from
	Experiment 6 and iron data from Experiment 7.

Busy week for Dr. Anderson
• I will be tied up off-campus most of this week
 No office hours on Friday — rescheduled for Monday morning
• Office hours Monday, April 6, 9:30 — 11 a.m.

