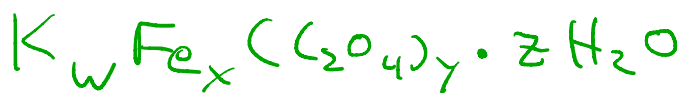


5/11/20

11

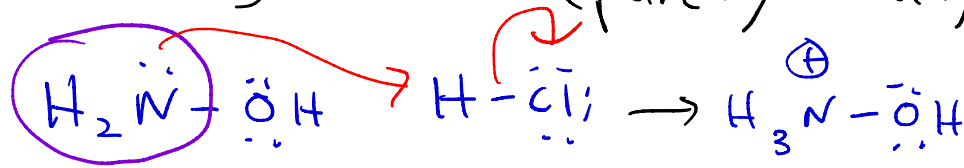
Experiment #2 (ΔH_{vap})

- Data
- Calculations (including a graph)
- % error
- No purpose, conclusion, discussion
- Report cannot be a spreadsheet alone



Part 4: Analysis of Fe(III)

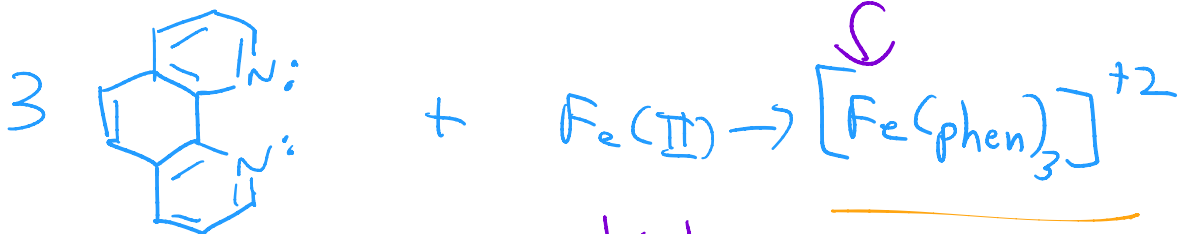
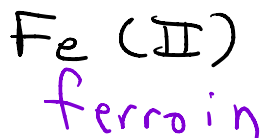
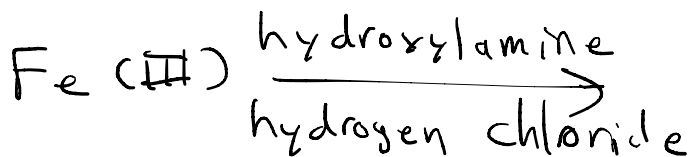
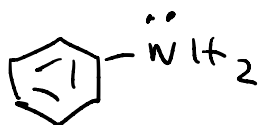
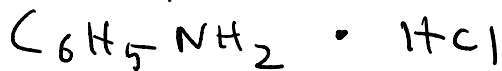
The iron (III) from the green salt is going to be captured in a new, separate complex, so that the iron (III) can be separately analyzed.



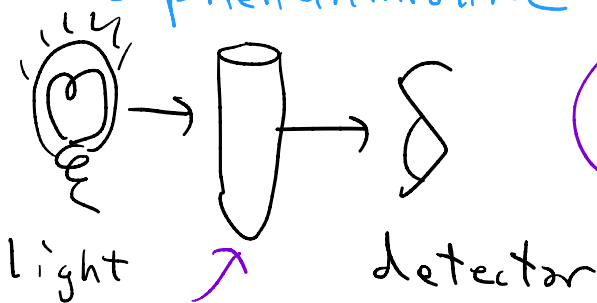
hydroxylamine

hydrochloride

Aniline hydrogen chloride



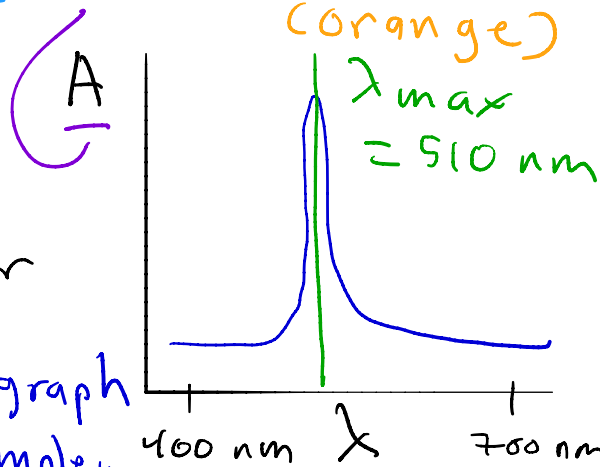
ortho-phenanthroline



cuvette

This absorbance graph shows that the complex between Fe(II) and phenanthroline is most sensitive at $\lambda = 510 \text{ nm}$. This is therefore the wavelength to use to analyze the compound,

absorbance complex ion (orange)



Beer's law

13

$$A = l \cdot c \cdot \epsilon$$

absorbance

path length

concentration

extinction coefficient

— how sensitive a substance is to a particular wavelength of light,

Since the ferroin complex is well-studied, meaning ϵ is known, and since a cuvette with a fixed pathlength (l) is used, the concentration of ferroin can be determined by measuring the absorbance. From this concentration, the amount of iron in the green salt can be determined.

Part 5 - Hydrate analysis

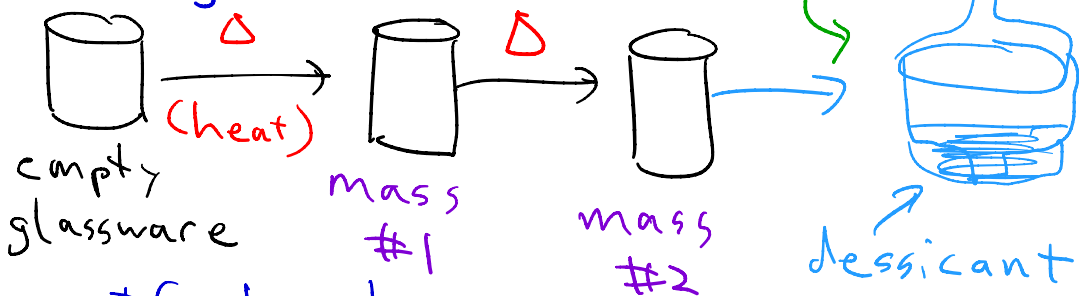
hygroscopic — a substance that

spontaneously absorbs water

— Glassware is hygroscopic, so the glassware must be heated to drive off any water before it is used so it does not interfere with measuring the hydrate.

Heating to constant mass

dessicator 14



If the glassware is heated appropriately, all of the water should have been driven away after the first heating, so mass measurements #1 and #2 should be the same, within a reasonable degree. If the measurements are not the same, the process is repeated until they are.

dessicant - "drying agent" - a substance that is so hygroscopic it is used to remove water from other substances,

dessicator - a chamber containing dessicant used to keep glassware or reagents free of water,

To analyze the green salt, the glassware would first be heated to constant mass, then a sample of the green salt would be measured, then the salt would be heated to constant mass, (5

The difference in mass before and after heating the green salt is the mass of water in the green salt hydrate.