

# Spectroscopic Determination of Fe in Vitamin Tablets and an Unknown Powder

## Procedure

For the most part, use procedure described by Harris.

IN ADDITION, prepare and analyze the other unknown given by the instructor. For the other unknown, replace step one with the following.

## Preparation of unknown 2

Replace step 1 of Harris's procedure with this: Accurately weigh about 0.1 g of your unknown to make 250 mL of solution. Add a drop or so of sulfuric acid before dilution to aid dissolution.

Note, you will need to perform step 5 on unknown 2 as well as on the vitamin unknown.

The same calibration curve may be used for both unknowns. So you do not have to repeat any of the steps involving iron standards.

The calibration curve will tell you the concentration of iron in the solution you measured. You need to use your solution prep information to determine the amount of iron in your original solid (tablet/powder) and report that!

Therefore, keeping track of your solutions is key to making this experiment work. Give each solution a name and write specifically (with numbers) how you make each solution, as you make it. Label the volumetric flask or storage bottle with this name. Do not depend on your directions to keep track of solutions: it does not work.

Keep your original iron standard and original unknown solutions for the atomic absorption experiment below.

## **Atomic Absorption Spectrophotometry of Fe**

Use your standard iron solution, the vitamin solution resulting from the END of step 1 of Harris's procedure and the "unknown 2" solution described above.

### Analysis of vitamin solution:

Obtain 4 – 100 mL volumetric flasks. Label them A, B, C and D.

To each volumetric flask add 5 mL of vitamin solution.

To flask B add 1 mL of iron standard.

To Flask C add 2 mL of iron standard.

To Flask D add 3 mL of iron standard.

Dilute all Flasks to the mark.

You will be shown how to use the atomic absorption spectrometer by the instructor. Measure the absorbance of all 7 solutions. If one of the solutions has an absorbance above your standards, dilute it again (using a smaller aliquot or a serial dilution) and remeasure all your standards and the unknowns.

Use the standards to construct a standard addition curve. Use the curve to determine the concentration of iron in each of your in your vitamin solution. Use this information and your solution prep information to calculate the mg of iron in the ORIGINAL solid (Tablet).

### Analysis of powder unknown:

Repeat the experiment above using your unknown 2 solution instead of the vitamin solution. Using the standard curve to determine the concentration of iron in the solution. Use this to calculate the percent of iron in the powder. Report iron in powder NOT iron in solution.