

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 this unknown 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.

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.

Make 4 100-mL standard iron solutions in the range of 0-10 ppm. Also prepare 100 mL of blank from a couple drops of sulfuric acid in deionized water.

Dilute 5.00 mL of vitamin solution to 100 mL.

Dilute 10.00 mL of unknown 2 solution to 100 mL.

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 calibration curve. Use the calibration curve to determine the concentration of iron in each of your unknowns. Use this information and your solution prep information to calculate the iron in the ORIGINAL solid (Tablet/powder).