

Agri 201

Spectrophotometry of Soluble Iron.

Equipment:

Spectrophotometer (Hach DR2000)	(1) 200 ml plastic bottle
(1) 10 ml Pipettor and tips	(1) 1ml pipettor and tips
(10) 100 ml plastic cups	(1) 100 ml graduated cylinder
(8) 50 volumetric flasks	(1) Chemical waste container
(10) plastic cuvettes	(1) balance (+/- 0.1mg resolution)

Reagents:

1.2 M Sodium Acetate	10% Hydroxylamine Hydrochloride
0.1% 1,10 phenanthroline *	Unknown Iron solution
Infant iron supplement	De-ionized water

*Place 0.1g of 1,10 phenanthroline into labeled container and add 100 ml of DI water. Warm slightly if necessary. Each milliliter is sufficient for no more than 0.09 mg of Fe. Prepare no more than is needed, it darkens on standing and then must be discarded.

Procedure:

1. Blank

- a. Add 10 mls of DI water to a 50 ml volumetric flask.
- b. Add 5 ml of 1.2 M Sodium Acetate.
- c. Add 0.5 ml of 10% Hydroxylamine Hydrochloride.
- d. Add 5 ml of 0.1% 1,10 phenanthroline
- e. Let stand 5 minutes
- f. Dilute to 50ml mark with DI water, mix well and pour into plastic container.
- g. Place solution in plastic cuvette and use to zero spectrophotometer set at 508nm.

2. Standards** and Samples

- a. Add 1 to 10 mls*** of sample or standard to a 50 ml volumetric flask.
- a. Add 5 mls of 1.2 M Sodium Acetate.
- b. Add 0.5 ml of 10% Hydroxylamine Hydrochloride.
- c. Add 5 mls of 0.1% 1,10 phenanthroline
- d. Let stand 5 minutes.
- e. Dilute to 50ml mark with DI water, mix well and pour into plastic container.
- f. Place solution in plastic cuvette and read in spectrophotometer set at 508nm.

** You should have at least 4 standard that are with in the range of 0.1 and 1.0 absorbance units.

*** The amount of sample used depends on how much iron it contains. Readings above your standard curve can't be used.

Report the accuracy, precision, and limit of detection of this technique along with the concentration of iron in ppm (mg/L) of the unknown solution and infant solution.

