

## The Titrimetric Analysis of Vitamin C

Pre-lab report must be written inside your lab notebook.

IMPORTANT: Make sure that you always follow the proper laboratory safety protocol (refer to the course syllabus) BEFORE going to the lab.

**Note: The experimental procedures for this assignment are provided as a handout.**

### Online Resources and Tutorials

[Online Resource about Vitamins](#)

[REDOX Chemistry Tutorials](#)

### Pre-lab Report Guidelines

**(There is ONLY ONE pre-lab report for this experiment. Turn in your pre-lab report at the BEGINNING of the FIRST DAY of lab for this experiment)**

- (I) Introduction: In this section outline the goal(s) of the experiment as well as the experimental techniques that you will be using in the experiment.
- (II) Flowchart of the Procedures for the entire experiment and cite the reference for the Procedure.
- (III) MSDS Information (*Refer to the MSDS handout for more information*)

The following chemicals will require you to use the MSDS database on the Web:

**KIO<sub>3</sub>; Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> and L-ascorbic acid**

You should record the following MSDS information in your notebook for the chemicals listed above.  
**(Printouts directly from the Web pages will NOT be accepted!!)**

- (a) Product Name
- (b) Chemical Formula
- (c) Formula Weight
- (d) Melting Point; Boiling Point and Density
- (e) Health Hazard Data (**summarize in your own words**)
- (f) Spill and Disposal procedures (**summarize in your own words**)

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(IV) Study Questions (You MUST show ALL your work in order to receive FULL credit)

1. A 0.4283 g sample of  $\text{KIO}_3$  is transferred to a 250-mL volumetric flask, dissolved and diluted to the mark with distilled water. What is the molar concentration of the  $\text{KIO}_3$  solution?
2. A 25-mL aliquot of a 0.0104 M  $\text{KIO}_3$  solution is titrated to the stoichiometric point with 17.27 mL of a sodium thiosulfate,  $\text{Na}_2\text{S}_2\text{O}_3$ , solution. What is the molar concentration of the  $\text{Na}_2\text{S}_2\text{O}_3$  solution?
3. Describe how the starch solution is used to detect the stoichiometric point in titration.
4. What is the color change at the stoichiometric point in vitamin C analysis? What is the cause of such a color change?
5. Explain why cooked fruits and vegetables have a lower vitamin C content than fresh fruits and vegetables.
6. Identify the oxidizing agent and reducing agent in reaction 3 (refer to your handout).
7. Six ounces (1 fl. Oz. = 29.57 mL) of a well-known vegetable juice contains 35% of the recommended daily allowance of vitamin C (equal to 60 mg). How many milliliters of the vegetable juice will provide 100% of the recommended daily allowance?

(V) Data & Observations (Use a NEW page for this part)

Set up BLANK DATA TABLES for the entire experiment. You will need to go through the procedure in order to see what types of data you will need to collect during the experiment.