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CH 204
6/23/15

Experiment 5: Determination of Phosphate in Water (*Example of proper lab report*)

Introduction

Phosphates in surface water have been implicated in accelerating eutrophication of bodies of water.[1] Eutrophication is the natural aging process which a body of water, such as a bay or lake, undergoes. Phosphates enter waterways from human and animal wastes, phosphate-rich bedrock, and laundry, cleaning, and fertilizer runoff.   If too much phosphate is present in water, algae and weeds may grow rapidly, choke the waterway, and consume large amounts of oxygen resulting in the death of fish and other aquatic species. The purpose of this experiment was to determine the phosphate content in a water sample collected from Lithia Park in Ashland, OR. A series of phosphate standard solutions was prepared and subsequently mixed with ammonium vanadomolybdate reagent to form a colored complex. The absorbance of the phosphate standard solutions was measured using a spectrophotometer. According to Beer's Law, shown in eq 1, the spectrophotometric absorbance of a species is directly proportional to the concentration of the species in solution:

$$A = abC \qquad\qquad (1)$$

In eq 1, A is the absorbance of the species in solution, b is the pathlength (cm) of the cuvette, C is the concentration (mol/L) of the substance, and a is the molar absorptivity (L/cm-mol) of the substance.

A line was fit to the absorbance-concentration data for the phosphate standard solutions. A sample of water from a municipal pond was prepared in the same way as the standard solutions and its absorbance determined. From the equation of the best-fit line to the standard solution data, the concentration of phosphate in the water sample was calculated.