Procedure

A sample of oven-dried potassium dihydrogen phosphate was weighed and dissolved in distilled water in a 1 L volumetric flask to prepare a stock phosphate solution. The concentration of this stock solution was calculated. A series of six phosphate standard solutions that ranged from 7×10^{-4} M to 1×10^{-5} M was prepared by dilution of the stock phosphate solution into 50 mL volumetric flasks. The concentrations of the six stock solutions were calculated. A 5 mL portion of each standard solution was placed into an optical glass cuvette. To each cuvette, 1.6 mL of the color enhancing reagent ammonium molybdate/potassium antimonyl tartrate was added. An intense blue coloration was noted. The color was allowed to develop for 10 minutes, and the absorbance of the standard solutions was measured at 880 nm on a Spectrum SP-1105 spectrophotometer versus a blank composed of the ammonium molybdate/potassium antimonyl tartrate solution and water. The absorbance-concentration data were plotted using Microsoft Excel, and a line was fit to the data.

A sample of water obtained at the upper duck pond in Lithia Park, Ashland, OR on June 22, 2007 was prepared as follows. A 50 mL portion of the water sample was acidified to release phosphate ions, and evaporated to about 10 mL on a hot plate. The solution was then neutralized and diluted to 50 mL with distilled water in a volumetric flask. A 5 mL portion of this solution was placed into an optical cuvette and was treated with the ammonium molybdate/potassium antimonyl tartrate solution. The absorbance of the unknown solution was measured at 880 nm.

Detailed procedures may be found in the course lab manual.[2]

Results

Table 1 shows the mass of the KH_2PO_4 sample used to prepare the stock phosphate solution.

Table 1. Mass of potassium dihydrogen phosphate used for the stock standard solution.

Substance	Mass (g)
KH_2PO_4	0.1387

Figure 1 shows a plot of the absorbances measured for the phosphate standard solutions, along with the best-fit line to the data.