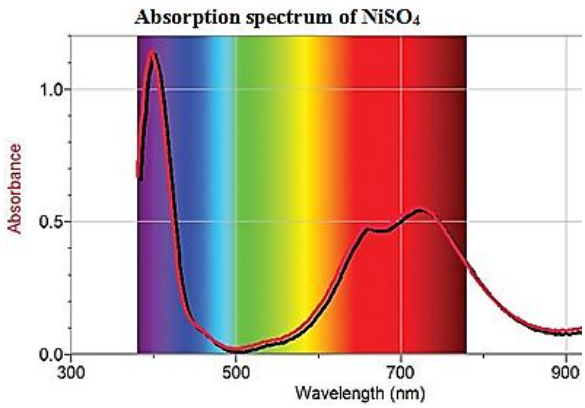
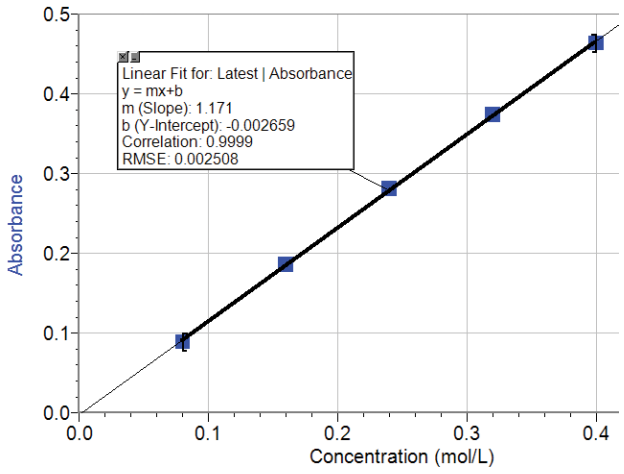
Vernier Spectrophotometer User's Guide

1. Use a USB cable to connect a spectrometer *to the computer* (not to the USB hub)
2. Open Logger *Pro*
3. **Calibrate the spectrometer**.
   a. Prepare a *blank* by filling an empty cuvette ¾ full with DI water. Place the blank cuvette in the spectrometer with the *clear sides of the cuvette in the path of the light source*.
   b. Select ***Calibrate Spectrometer*** from the Experiment menu. The calibration dialog box will display the message: "Waiting ….. seconds for lamp to warm up." The *minimum* warm up time is one minute, but best to wait ~3 minutes. Follow the instructions in the dialog box to complete the calibration. Click OK .
4. **Absorption Spectrum and the Determination of the λ_{max} of a colored solution**
   a. Empty the blank cuvette and rinse it twice with small amounts of the colored solution. Fill the cuvette ¾ full with the solution and place it in the spectrometer.
   b. Click Collect. A graph of the colored solution's absorption spectrum will be displayed. Note that one area of the graph contains a peak absorbance. Click Stop to complete the analysis.
   c. *To save your graph of absorbance vs. wavelength*: Select *Store Latest Run* from the *Experiment menu*. If required by your instructor you may print the graph (absorption spectrum)—Print *two* copies of the graph—one for the white pages and one for the yellow pages of your lab report.



5. **Configure the Spectrometer for Data Collection:**
   a. Click the data collection icon, , on the toolbar. A dialog box will appear:
      - Select **Abs *vs.* Concentration** under *Set Collection Mode*. The wavelength of peak absorbance (λ_{max}) will be automatically selected. If you wish to select a new wavelength, click on the graph or check the box next to the desired wavelength. Click OK to proceed.
6. **Collection of absorbance-concentration data and the making a Calibration Curve (Beer's Law Plot)**
   a. Place a cuvette containing the first standard solution in the spectrometer. Click Collect. When the absorbance reading stabilizes, click Keep (***Do not click Stop!!***). Enter the concentration of the standard solution and click OK (***Do not click Stop!!***). Record the absorbance of the solution.
   b. Discard the cuvette contents. Using the next standard solution, rinse and fill the cuvette ¾ full. Wipe the cuvette and place it in the spectrometer. When the absorbance reading stabilizes, click Keep (***Do not click Stop!!***). Enter the concentration of Solution 3 (in moles/L) and click OK (***Do not click Stop!!***). Record the absorbance of solution 3 in your lab notebook.
   c. Repeat Step 5b for the remaining standard solutions.
   d. When you have finished testing the last of the standard solutions, click Stop .



7. To determine the best-fit line equation for the standard solutions, click the linear fit button, , on the toolbar. *Write the equation of the standard curve in your lab notebook*.
   a. ***Print*** two copies of your absorbance vs. concentration graph, one copy for the white pages and the other for the yellow pages of your lab report.
   b. Select ***Save As*** from the File menu and save your experiment file.

Updated Spring 2013