

Shimadzu UV-1700 UV/Vis Spectrometer

Updated July 13, 2010

Instrument instructions can be found at:

<http://academic.bowdoin.edu/chemistry/resources/instructions.shtml>

If you have any problems with the instrument or would like to get trained, please contact Celeste

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Using UV with Computer

1. Protocol

- a. **Read instructions carefully before using instrument.** Reading the bold sentences in each category will tell you what you need to know to run the instrument.
 - i. Bullets are under the bold sentences when more detail is required.
 - ii. At the end of the instructions is a frequently asked questions/troubleshooting section.

2. Startup Procedure

- a. **Turn on instrument.**
 - i. Allow instrument to warm up for fifteen minutes.
- b. **Turn on computer and login** (use your Bowdoin account).
 - i. First time users only.
 1. Create folders to store your data, method, and sequence.
 - a. Open Windows Explorer.
 - i. (Start > All Programs > Accessories > Windows Explorers).
 - b. Go to Desktop > My Computer > Local Disk (C:) > Program Files > Shimadzu > UVProbe.
 - i. Create a data and methods folder.
 - ii. Click once on the data folder to highlight it.
 - iii. Go to (File > New > Folder).
 - iv. Type in your name or initials to name that folder.
 - v. Repeat for the methods folder.
 2. Configure a network printer and set it as default.
 - a. Make sure you are connected to the Bowdoin network.
 - b. Go to Start > Run.
 - c. Type in the location of the printer.
 - i. Second floor – “\\madison\dahlia”.
 - d. Click OK.
 - e. Set printer as default.
 - i. Start > Printers and Faxes.
 - ii. Right click on printer you just added.
 - iii. In the menu, select “Set as Default Printer”.

- c. **Open UV Probe 2.10.**
 - i. (Start > All Programs > Shimadzu > UVProbe).
- d. **Give control of instrument to computer.**
 - i. On the instrument
 - 1. After the UV has finished its checks, the Mode screen will be displayed. Press the F4 key (PC Ctrl) on the instrument keypad to give control to the computer.
 - i. On the computer
 - 1. Connect computer to instrument (Instrument > Commands > Connect).
- e. **Enter sample information into UV log sheet.**

3. Create/Edit Method

- a. **Load method** (Edit > Method).
- b. **Edit parameters.**
 - i. Measurement Tab.
 - 1. Set the wavelength range – starting and ending values.
 - 2. Set scan speed.
 - 3. Set sampling interval.
 - 4. Under Scan Mode click Single.
 - ii. Instrument Parameters Tab.
 - 1. Select absorbance as measurement mode.
 - 2. Click OK.
 - iii. Change Y-axis range.
 - 1. Go to the overlay graph (select tab at top of graph or Graph > Overlay) and click on the minimum and maximum absorbance values.
 - 2. Enter a new value.
 - 3. When finished, click anywhere on the screen to get out of this mode.
- c. **Save method** (File > Save As).
 - i. Enter file name.
 - ii. In the Save As Type list, click Method File (*.smd).
 - iii. Click Save.

4. Collect Spectrum

- a. **Perform baseline correction.**
 - i. Make sure sample and reference compartments are clear.
 - ii. Be sure to “Autozero” before collecting the baseline to get the ABS at 0.000 (Instrument>Commands>Autozero).
 - iii. Collect baseline (Instrument > Commands > Baseline).
 - iv. When the Baseline Parameter box appears, enter the starting and ending values.
 - v. Click OK.
- b. **Insert sample** (front cell holder) **and reference** (back cell holder). Clear sides of the cuvette face left and right.
- c. **Start scan** (Instrument > Commands > Start).
 - i. When scan is complete, a New Data Set box will appear.

1. Files – Click browse and enter a new file name. This is the only thing you will open to retrieve your file.
 2. Storage – Enter a name here. Storage is used for multiple spectra stored in one file.
 3. Data Set – If you manipulate the spectrum, they will be stored as a data set. The original spectrum you collected will be called “RawData”.
- ii. Save (File > Save All).
- d. **Remove sample and reference from compartment.**

5. Analyze Spectrum

- a. **Perform peak pick** (Operations > Peak Pick).
 - i. The Operations screen will open to display results.
 - ii. Right click on the Peak Pick table and make sure Mark Peaks and Show Peaks are selected.
 - iii. Adjust peak threshold (if necessary).
 1. Right click on Peak Pick table and select properties.
 2. Enter new threshold value.
 - iv. Close Operations screen (View > Operations).
 - v. Print peak pick results (File > Print > Current View).

6. Print Spectrum

- a. **Print spectrum** (File > Print).

7. Shutdown Procedure

- a. **Disconnect computer from instrument** (Instrument > Commands > Disconnect).
- b. **Turn off instrument.**
- c. **Log off computer.**

Using UV without Computer

1. Protocol

- a. **Read instructions carefully before using instrument.** Reading the bold sentences in each category will tell you what you need to know to run the instrument.
 - i. Bullets are under the bold sentences when more detail is required.
 - ii. At the end of the instructions is a frequently asked questions/troubleshooting section.

2. Startup Procedure

- a. **Turn on instrument.**
 - i. Wait for instrument to go through its initial checks.
 - ii. Allow instrument to warm up for fifteen minutes.
- b. **Enter sample information into UV log sheet.**

3. Edit Method

- a. **Edit parameters.**
 - i. Select Spectrum (2 on keypad).
 - ii. Change parameters – press numeric key on keypad that corresponds to the parameter you want to change, change the value, and press enter.
 1. Select measurement mode.
 2. Set scan and y-axis range.
 3. Set scan speed.

4. Collect Spectrum

- a. **Perform baseline correction.**
 - i. Make sure the sample and reference compartments are empty.
 - ii. Perform baseline correction (F1 on keypad).
- b. **Insert sample** (front cell holder) **and reference** (back cell holder).
- c. **Start scan** (Start/Stop button on keypad).
- d. **Remove sample and reference from compartment.**

5. Analyze Spectrum

- a. **Perform peak pick.**
 - i. Select data processing (F2 on keypad).
 - ii. Select peak operation (3 on keypad).
 - iii. Print peak pick results (F2 on keypad).

6. Print Spectrum

- a. **Print spectrum** (Print on keypad).
 - i. From the peak pick results, return to spectrum (F1 on keypad).

7. Shutdown Procedure

- a. **Return to main screen** (Mode on keypad).
 - i. Do not save spectrum (F3 on keypad)
- b. **Turn off instrument.**

Shimadzu UV-1700 Frequently Asked Questions

1. How do I setup the screen to display only what I need?

View > Graph will already be selected (this option cannot be deselected).

- a. **View > Photometer Status.**
- b. **Graph > Overlay.**
- c. **Window > Spectrum.**

2. What are print layouts and how do I use them?

Print layouts are templates used when printing reports.

- a. **Open Report Generator** (Window > Report Generator).
- b. **Open a graph and edit it to display the information you want.**
- c. **Save graph as a new name.**
- d. **Return to spectrum screen** (Window > Spectrum).
- e. **Open Quick Print** (View > Setting) and select **Quick Print tab.**
- f. **Select the Overlay Spectrum Graph.**
 - i. Click the Brower button and find the graph you created.
- g. **Click Print Preview to make sure everything is correct** (File > Print Preview).
- h. **Print graph** (File > Print).
- i. **Return Overlay Spectrum Graph to its default.**
 - i. Quick Print tab (View > Setting), hit the Reset button.

3. How do I display/delete graphs?

- a. **Display legend** (Graph > Legend).
 - i. Open spectra you would like to view.
 - ii. Overlay view will show all the spectra open.
 - iii. The Active view will only show the spectrum that was most recently opened.
- b. **To delete graphs from the legend box, open** (File > Properties).
 - i. Expand the folders until you see the RawData files.
 - ii. Select and hit the Delete button to remove. This will remove the spectrum from memory, not from the disk.