

Cary 50/60 UV-VIs Use Guidelines

General Instrument Information:

- The UV-VIS is capable of spectroscopic measurements from 200-800 nm, assuming the proper cell type is used.
 - For absorbance readings below 280 nm, QS labeled Optical Quartz cuvettes must be used.
- All cuvettes should be cleaned before and after use with water, and dried with ethanol. Samples should **never** be left in the cuvette after measurements, as they can permanently adsorb to the walls.

Instrument Startup:

- The instrument is generally left on, but you will need to log on to the computer either as yourself or using the login information attached to the computer monitor.
- Once logged in, you will need to start one of the instrument programs to collect data. Rather than having one program with multiple settings, each type of measurement for the Cary instrument uses a different program. All of the programs can be accessed through the “Cary WinUV” folder on the desktop.
 - The “Scan” program is what you will primarily use to collect data. It will collect a spectrum of absorbance data between two specified wavelengths.

Running a Sample:

- Before any sample or blank is run, ensure that you have a data folder under your name in the “documents” section of the PC. If one does not exist, create it- all of your files will be saved to this location.
- Configure the instrument settings for your work using the “Setup...” button- wavelength range, resolution, etc.
 - Once set, any changes to the method will require a new blank to be run, so make sure all of your settings are correct.
- Insert your cuvette, containing your solvent blank, into the cuvette holder.
- Click “Baseline” on the instrument control window.
 - If the “Baseline” button is greyed out, it is because the baseline function has been deactivated in the Setup window. Open Setup, select the “Baseline” tab at the top of the setup window and select “Baseline Correction” to activate it.
 - This baseline value will be automatically subtracted from all subsequent runs. **Caution:** if you run a sample with a lower absorbance value than the blank, it will record as a negative value.
 - To minimize any instrument drift, measurements should be taken out to 800 nm. Generally, the absorbance in the 500-700 nm region contains a portion with zero absorbance, which can be used to correct between samples.
 - “Zero” is not the same as collecting a baseline. Zero sets the absorbance at the current wavelength to a reading of 0 Abs, but does not scan the entire wavelength range.
- Remove your solvent blank, clean and dry the cuvette, and add your sample.
- Click “Start” on the instrument control window.
- Before the instrument will collect data, you will be asked to specify a file name (which should be in the directory you set up above), and name the sample you are running. Successive runs will be saved to the same file, with each sample named separately.
 - To export your data to Excel, chose File -> Save Data As -> CSV, which will generate a comma-separated values file that you can open in Excel.
 - **Important:** Save both the raw data and the excel file for any data you collect.
- Clean the cuvette, and dry with ethanol.

Shutting Down the instrument:

- The instrument itself does not need to be shut down.
- If you logged into the computer under your own username and password, you should log out once you are finished.
- If you logged in to the shared instrument account, you can leave the computer logged in when you are done.

Using the Peltier for Temperature Control:

While the peltier device can be controlled via the instrument setup prompt, the connection is tenuous and frequently creates more problems than it solves. Accordingly, all temperature control should be done manually by the controls on the peltier control box.

- Before turning on the temperature control, ensure that the cooling lines are properly set up and a **low** flow rate of water is running through them.
 - The peltier temperature control depends on a cool water flow to function. It uses an electrical heating element that will burn out without a way to regulate heat (for instance, by dumping excess heat into cool water).
 - For measurements below 15 °C, it is recommended to pass the cool water through an ice bath- the greater temperature differential will allow faster changes in temperature.
- Turn on the temperature control box. An error will sound if the control box is not connected to the cuvette holder.
- Target temperatures can be set, but it takes a little time for the peltier to equilibrate to a given temperature. Once equilibrated, it will take another few minutes for any solution inside a cuvette to equilibrate to the temperature set at the holder.
- At high temperatures, evaporation/condensation of liquid in the cuvette (even sealed) is a problem, and samples should be run as close to full of sample as possible.
- Before removing the cuvette, the temperature should be reset to room temperature (25 °C) to equilibrate it slowly. Temperature shock due to washing a hot cuvette with cool water can easily cause them to break, and hot cuvettes can burn you!
- Similarly, the peltier device should be allowed to return to room temperature before being turned off, and the water flow should be left on for approximately 15 minutes after the control box has been shut down.