

Standard Operating Procedure

Ultraviolet–Visible (UV-Vis) Spectroscopy in POWER Laboratory

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Description of Process

The ultraviolet–visible spectroscopy (UV-Vis) utilizes light to determine the absorbance or transmission of a chemical species in either solid or aqueous state.

Personal Protective Equipment

EYE PROTECTION: Safety glasses

PROTECTIVE CLOTHING: Laboratory coat and nitrile gloves

Sample Preparation Procedure

If the sample is in the solid state, the sample should be coated on to a desired, transparent substrate. A blank sample of the transparent substrate should be brought to do the experiments.

If the sample is in solution, it should be premixed to the desired concentration and a blank sample of the solvent should be brought to do the experiment. Note that quartz solution cells are located above the UV-Vis. If these cells are used, they should be cleaned before and after use with the solvent that is to be used during the experiment.

UV-Vis Procedure

1. Check inside the UV-Vis chamber to assure that the appropriate sample holder (*i.e.*, the liquid or solid sample holder) is in place. If it is not switch it out, the correct sample holder will be in the cabinet above the equipment.
2. Turn the UV-Vis on by pressing the ☺ button in the front of the unit. The unit is not operational until the blinking light on the button goes to a solid green color.
3. Log onto the computer connected to the UV-Vis.
4. Open Cary WinUV from the desktop. Click on Scan to start the program.
5. Click on Setup... to set the experimental parameters.
 - a. Carry Tab
 - i. Change the Wavelength range settings, if applicable.
 - ii. Set Scan controls to an appropriate speed. The “Slow” setting is a good choice if data is for publication.
 - b. Baseline Tab
 - i. Select Zero/baseline correction
 - c. Click OK. A pop up will come up that will tell you that the baseline is not valid, click OK.
6. Click on the Baseline Button on the left-hand side of the screen. A pop up will prompt you to place the blank substrate in the holder. Once this is in place click OK.
7. The equipment will baseline and second pop up will come up that will instruct you to block the sample beam, do so by placing the cardboard to block the beam. Once this is done click OK.

8. Once the Baseline procedure is done remove the cardboard from the sample chamber. Click on Zero on the right hand panel.
9. Once zero is finished take out the blank sample and put in your sample.
10. Go to Start at the top center of the screen and click on it. Save your data to the correct file folder. Click Ok. The scan will begin at this time.
11. Once the scan is finished, a pop up will come up that will allow you to scan another sample of finish. If you are running multiple samples change your sample, change the sample name on the pop up box, and click OK otherwise click Finish.
12. Turn the UV-Vis ***OFF*** by pressing the ☹ button.
13. Logoff of the computer.
14. **Enter your sample and user information into the red logbook.**

Data Transfer Procedure

To access your data you can do it with directly from the program or open User Data from the desktop by selecting the appropriate file. Once your data is open go to File, Save As, and save it as .csv file. This will allow you to open the data in Excel.