

Shimadzu UV-Vis 2600 w/Integration Sphere Operating Procedure

Rochester Institute of Technology

Department of Chemistry and Material Science

SOP prepared by Robert Winter on November 29, 2018

Revision Number: 2

Date of Implementation:

Last Reviewed Date: 11/29/18



I. Purpose

To promote the effective use of the Shimadzu UV-Vis 2600 spectrometer in order to obtain surface reflectance of film samples.

II. Scope

This SOP is intended for in-group use by trained and certified personnel in the Chemistry Department.

III. Prerequisites

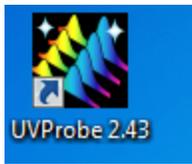
The experimenter must be trained in proper instrument techniques before using this SOP.

IV. Responsibilities

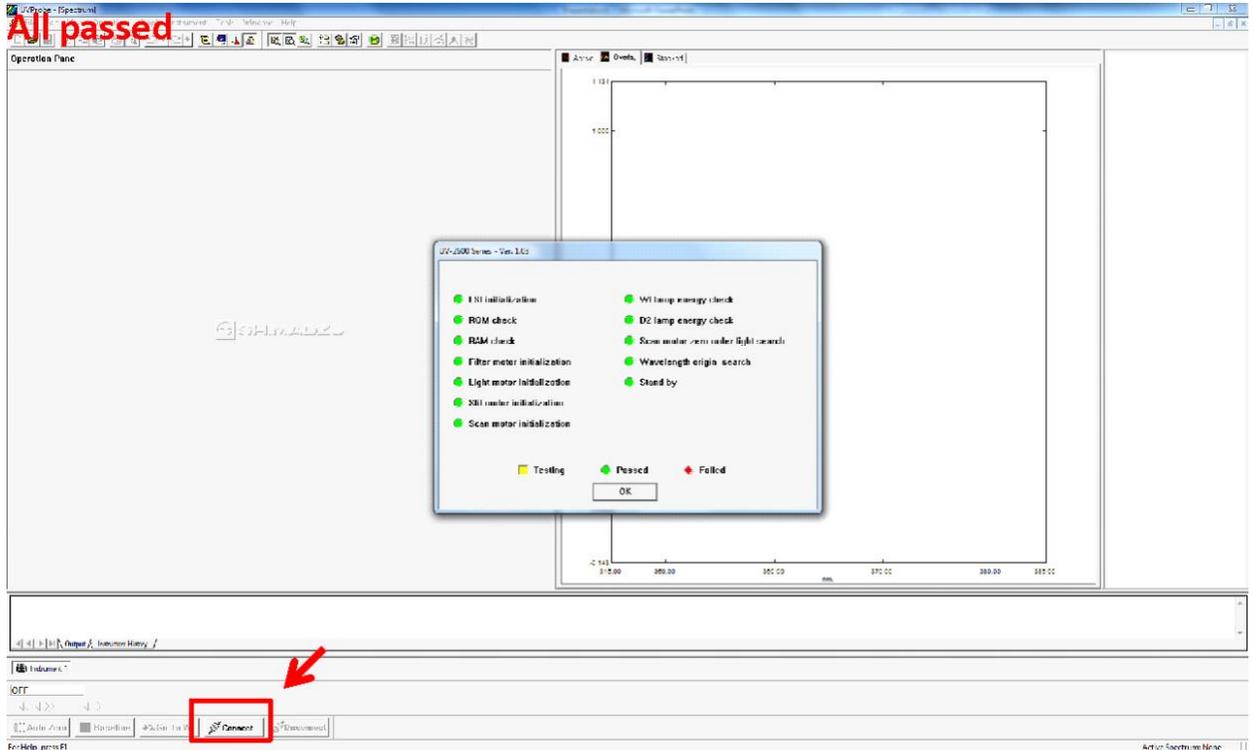
The responsibility for this instrument lies with Tom Allston
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V. Procedures and information

1. Turn on the UV-2600 UV-VIS spectrophotometer, using the power switch located on the right side of the instrument.
2. Open the UVProbe 2.61 software on the computer desktop



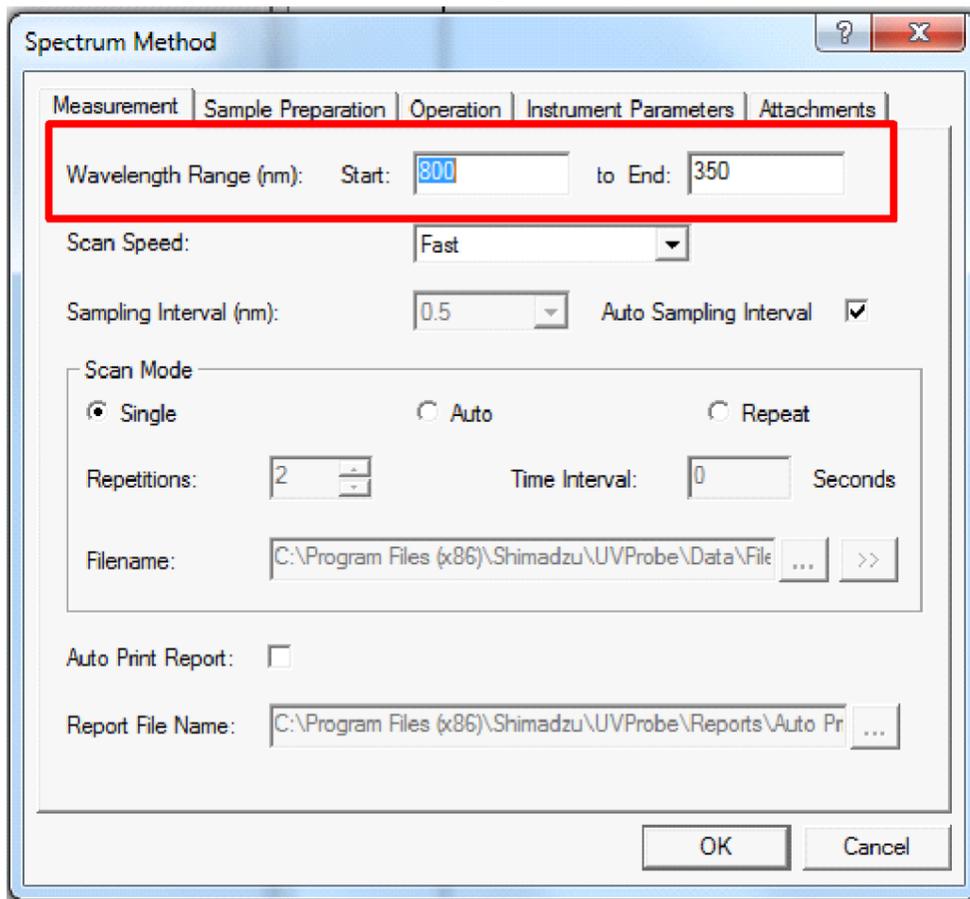
3. Click the Connect button on the bottom of the window and wait until it has performed all of its tests (they should all pass and have green dots next to them). Once the check is complete, click "OK".



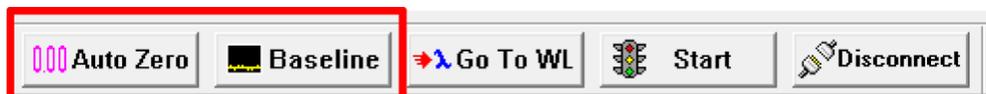
4. Click on the Edit method tab in the toolbar (the green M in a yellow circle).



- Under the “Measurement” tab, input the Wavelength Range (nm) you wish to scan between (Highest value goes in Start, Lower value goes in End).

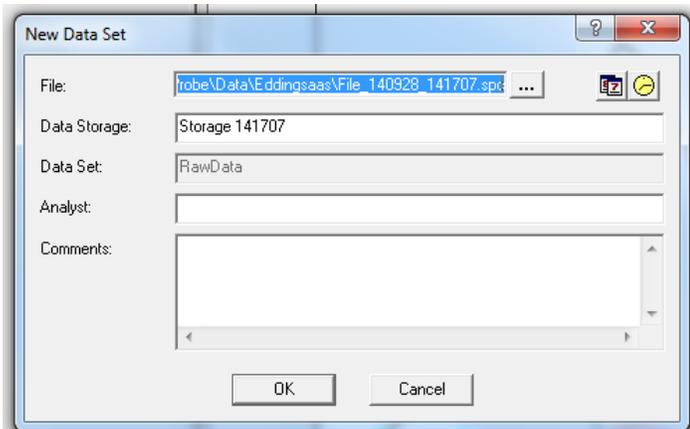


- Under the “Instrument Parameters” tab, the recommended “Slit Width” should be set to 1.0nm (or optimized to your experiment), “Measuring Mode” should be set to Absorbance, and “Detector Unit” should be set to External (2Detectors). Once parameters have been set, click “OK” at the bottom of the window.
- Be sure that both Barium Sulfate plates are in place on the integration sphere (this is necessary for both “Auto Zero” as well as to “Baseline”). Order is important, as the “Auto Zero” should be done first followed by the “Baseline”.

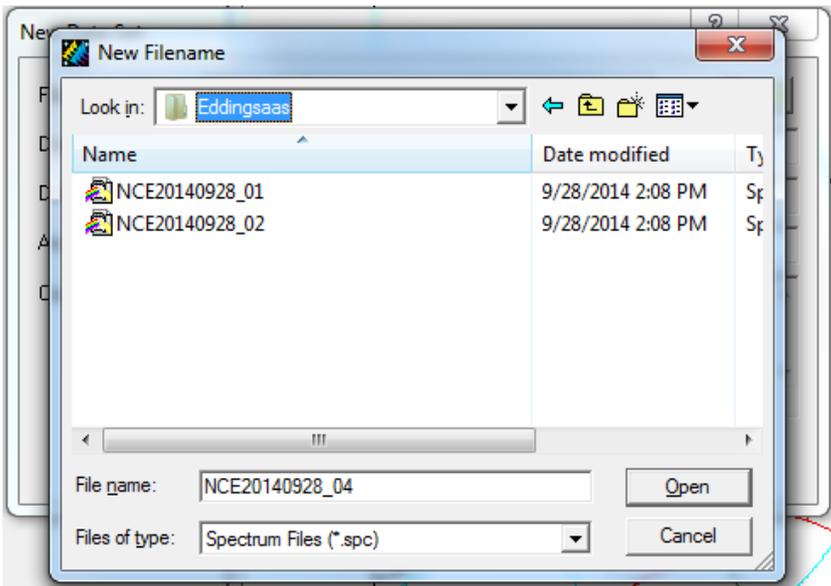


- Once the baseline scan is done you will hear the instrument beep. Open the lid to carefully remove the Barium Sulfate plate that is across from side marked “S” for sample and place in your sample you wish to be analyzed, then again close the lid.

- To begin analysis, click the “Start” button two over from the Baseline button at the bottom of the window.
- Before the spectrum has been collected, you will see a new window pop up:



This is where you will give the sample a file name. To the right of the File blank is three dots, click this to direct where to store the data, making sure to store it in the proper folder. It should be stored in the UVProbe-Data, then the Data folder directory, but be sure to create an individual or lab group folder to keep the data in.



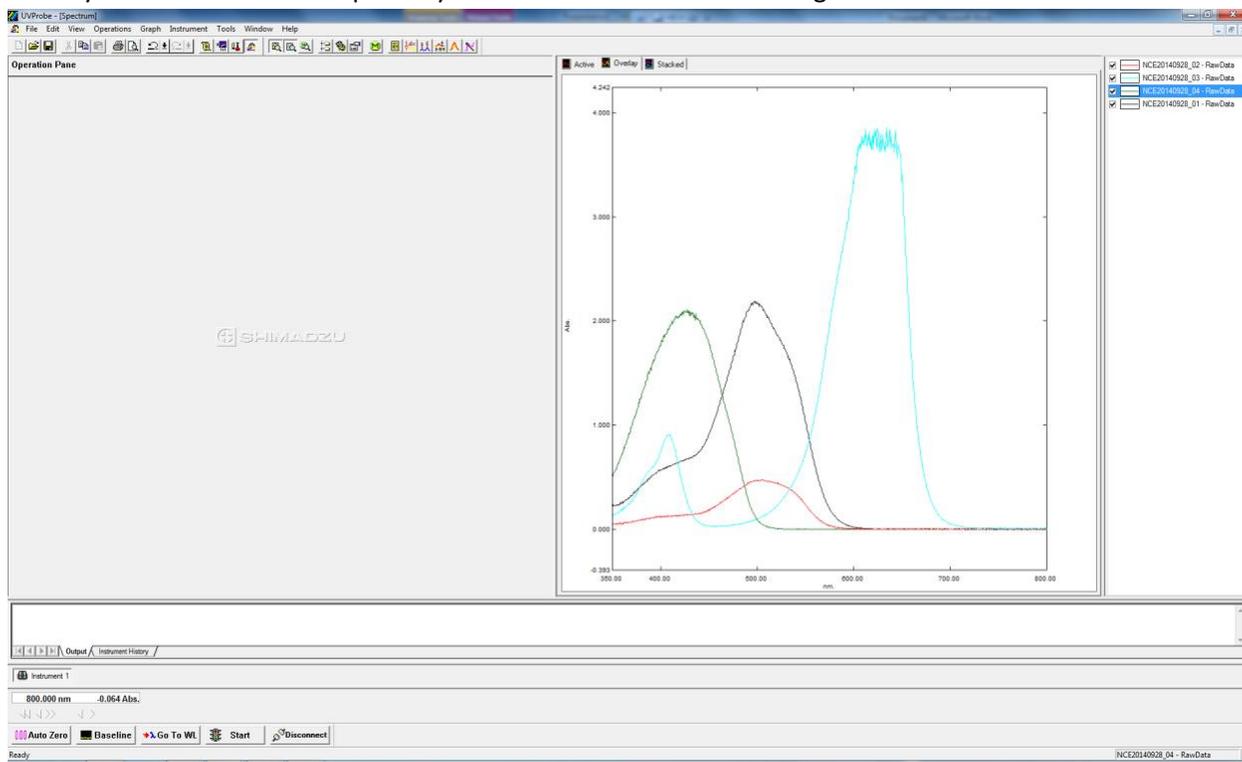
Once satisfied with the file location and name, select “Open” to confirm the input. After all the information is set, click “OK”. After this, the experiment will begin automatically.

Note: This does not save your data, it just sets up the raw data to be manipulated and later saved as the file when you so choose.

- Once the spectrum has been collected, go to “File” along the top toolbar and select the option for “Save”. This step will actually save the data to where it was specified previously.

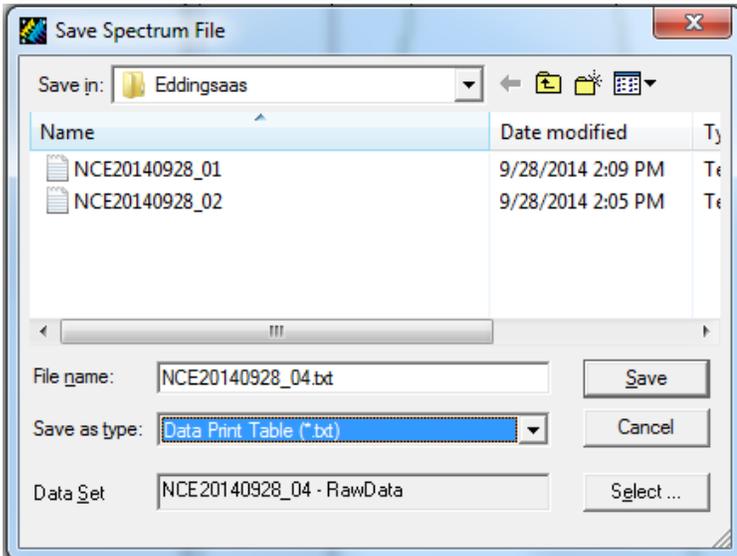
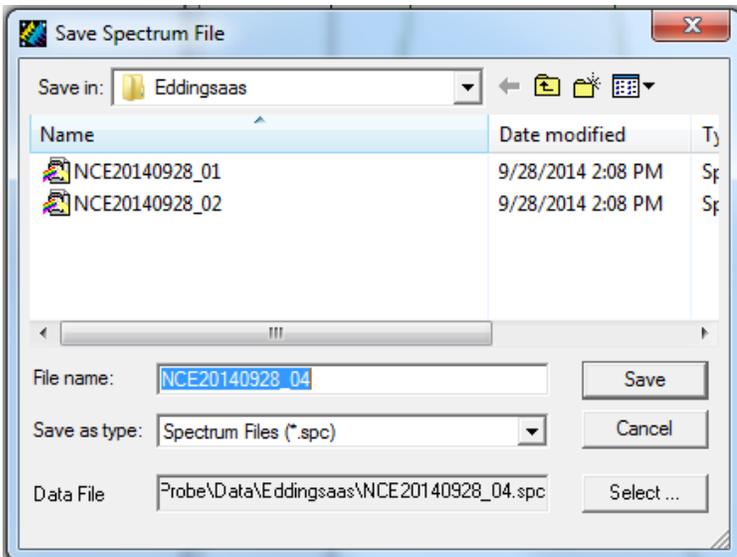
NOTE: Be sure to save the individual spectra immediately after the run has completed, this will ensure data is saved properly.

- Now your raw data will be displayed on the graph on the right hand side of the window. As long as you do not change any parameters or use a different solvent for your sample you can use the background you have already generated and run more samples by putting in your new sample and hitting the Start button. This will place all of your raw data onto one graph. Remember to save each spectrum as with its own file name and comment.
- Once you have taken some spectra your window will look something like this:



Notice that many of the solutions were too concentrated, if you have an absorbance that is greater than 2 you are much too concentrated. An absorbance of 2 is telling you that 99% of the light was attenuated, or another way of putting it, only 1% of the light made it through. Notice that all spectra are displayed. If you want to look at only one you can either uncheck all of the spectra but the one you want or better way is to click on the graph menu at the top and click the active button which will only display the spectrum that is active. While in the active graph setup, to observe another spectrum simply double click on its name in the list to the right of the active spectrum.

- An additional format may wish to be saved, called Data Print. This format provides the wavelength and corresponding absorbance in an easily transferable format. While in the active spectrum mode and having only one spectrum displayed, click on file and save as, make sure you are in the folder that you want your data saved in then save the file (already named) as "Save as type: Data Print Table (*.txt).



Do both of these saves to all of your data.

15. Be sure to also save or move your data to another device that is accessible to you, such as a flash drive or upload it to a cloud storage system such as google drive.
16. When done taking data click on the Disconnect button at the bottom of the window.
17. After disconnecting you can exit the program then turn off the instrument.