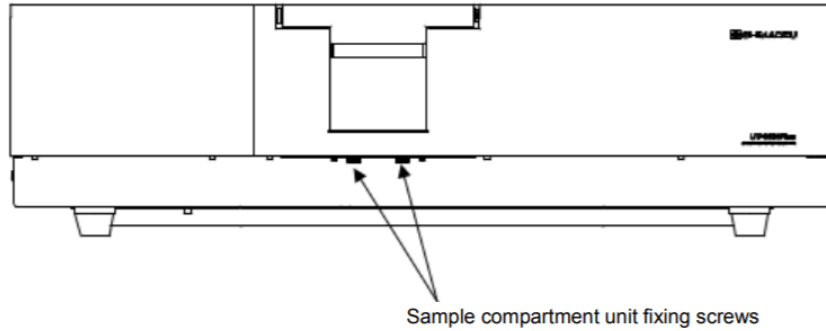
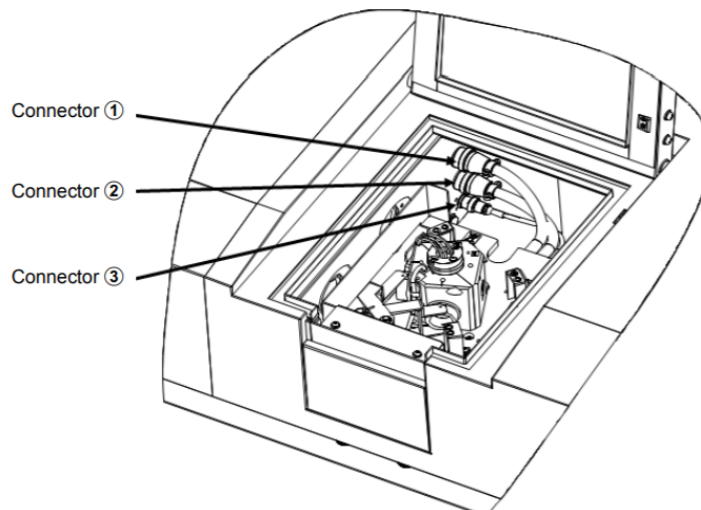


OPT4 Operating Procedure for Integrating Sphere Shimadzu UV-3600 UV-Vis-NIR Spectrophotometer

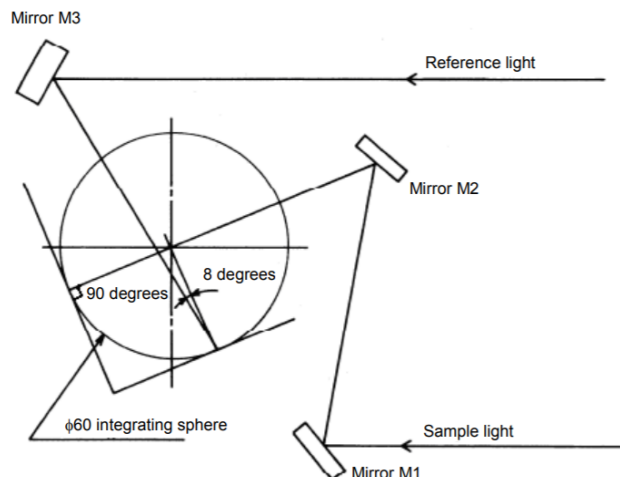
1. Create or Start a Reservation for OPT4 in CoreResearch
2. Load the integrating sphere into the instrument.
 - a. Remove the standard sample accessory inside the instrument:
 - i. Unscrew the front two screws until the screws drop.



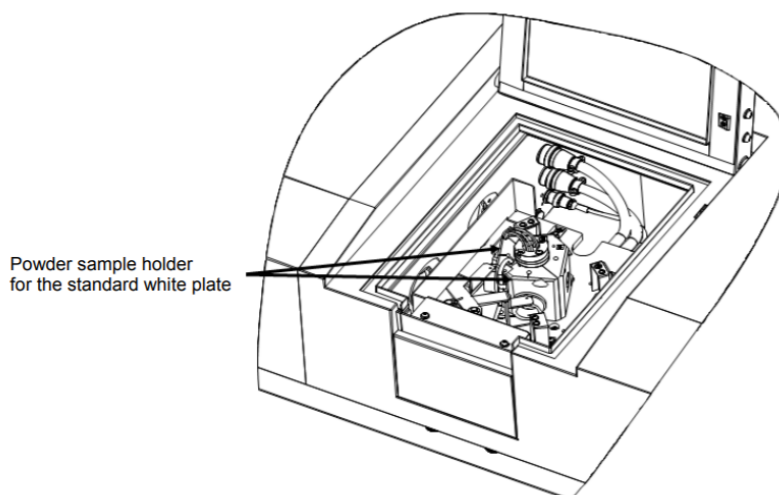
- b. Remove standard sample accessory.
 3. Install the ISR. **Note: The ISR should never be installed or removed when the instrument is on.**
 - a. Make sure the slot at the back of the integrating sphere goes under the screw at the back of the holder.
 - b. Connect the cables.
 - i. The bottom outlet is for the small cable, “3”.
 1. Note the direction of this cable.
 - ii. The middle outlet is for the cable labeled “2”.
 - iii. The top outlet is for the cable labeled “1”.



- c. Tighten the two screws at the front of the instrument.
 - d. Note the optical diagram of the ISR:



4. If you feel any kind of tension, this means that the integrating sphere is not aligned.
5. Insert the white plates at the sample and reference position in the integrating sphere.



6. Turn on the green power switch located on the side of the UV instrument. Wait 20 minutes for instrument to warm up.
7. Open the “Lab Solutions UV-vis” on the computer.
8. Click “spectrum”.
 - a. Environment settings is where the number of sig figs can be changed. Click number of digits and set values to change this.
9. Click “instrument control”.
 - a. Load your previously saved method file. If you do not have a saved method file, load the “integrating sphere (ISR) default method”.
10. To create or edit a method file, click “edit”.
 - a. Enter starting and ending wavelength.
 - b. Set desired data interval (typical value is 1 nm).
 - c. Set desired scan speed (typical is medium).
 - d. Set the value type and measurement type to reflectance.
11. Click on “Advanced”.
 - a. Set the desired slit width to 5 nm.
 - b. Slit program should be “standard”.

- c. Light source should be “automatic”.
 - d. Detector unit, sample side should be “external (3 detectors)”.
 - e. S/R switch should be “standard”.
 - f. Ensure that “perform stair correction” is checked.
 - g. Click “OK”.
12. Click on “close after creating new parameter file”.
- a. Enter filename of new parameter file and save in parameter folder.
 - b. Click “close”.
13. Set file and sample name.
14. Click on the “Connect” button. The system will go through several initialization checks that will take 10 minutes. When completed, click the OK button.
15. Perform a baseline correction
- a. A baseline correction should be performed at start-up, and anytime you change the parameter settings.
 - b. Make sure the white plates are installed at the sample and reference position.
 - c. Click “baseline”. Confirm wavelength range. Click “OK”.
16. Load the sample into the sample position and keep the standard white plate in the reference position.
17. Click the “Start” button to initiate the measurement.
18. Adjust the overlay graph Y axis values as desired (the X axis will scale automatically)
19. When the scan is complete ***the data is only stored in temporary memory, but not to the computer disk.***
20. To save the data to the computer disk:
- a. On “data print table”, there is an excel button. Open a blank excel book and then click the “excel” button. Your data should populate the open excel book. Save this file to your folder in the user data folder.
 - b. Click “text out” to save data as a .txt file.
21. To workup your data, click the “active tab” in the top left corner of graph.
- a. “Peak” will peak pick for you. Click “execute” on the right side.
 - b. “Peak area” will give a peak area for you when you select a desired wavelength range.
 - c. “Peak pick” will let you select a peak and it will read its absorbance.
22. Shut down the system
- a. Unload your sample and the plate at the reference position.
 - b. Click “disconnect” in the top right of the software.
 - c. Close the “Lab Solutions UV vis” software.
 - d. Turn off the green power switch on the side of the UV-3600 instrument
 - e. Unscrew the two screws at the front of the instrument.
 - f. Remove samples and standard white plates from the ISR.
 - g. Unplug the cables of the ISR. Be sure to rotate cable 3 to remove. Remove ISR and place back into plastic bag and then into box.
 - h. Install the standard sample accessory.
23. Stop or Update Actual Usage for your OPT4 reservation in CoreResearch