Shimadzu FT-IR Affinity Operating Procedure

Rochester Institute of Technology

Department of Chemistry and Material Science

SOP prepared by Robert Winter on March 14, 2019

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I. Purpose

To promote the effective use of the Shimadzu FT-IR Affinity in order to obtain an infrared spectrum of a sample.

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. Addition information

1. The FT-IR crystal can only be cleaned with a non-abrasive solvent like methanol or water.

VI. Procedures and information

1. Loosen black knob in middle of Pike ATR sample holder to raise the arm and swing to either side out of the way. Clean the ATR crystal and ATR crystal plate with an appropriate cleaner on a kimwipe (e.g. isopropyl alcohol, do NOT use acetone). Leave the arm out of the way.

2. Before operation, ensure that the orange light next to the power switch is illuminated (this indicates that the instrument is dry and eligible for operation).

3. Turn on power switch on front of the instrument (Green light will illuminate).

4. Open IRsolution program on computer desktop. Once the program opens, it will automatically begin its initialization procedure, let this run to completion (a popup may appear asking to perform an autoadjustment, if so hit “Cancel”).

5. Another popup will appear with the title, “QuickStart Accessories”, select “OK”. At this point, there should be four green lights along the right side of the program window. If so, the instrument is ready to use! (NOTE: if some or all of the lights are not green, please notify Tom Allston immediately!)

6. Select the option for “Measure”, then under the Data tab towards the bottom right side of program window, the parameters (i.e. scan range and number of scans) can be optimized by the user depending on the sample (a standard measurement is between 4000-400 1/cm and 10 to 20 scans).

7. Under the “Measure” button, you will see a line for Data file. Click the “…” button to select the folder needed and save your data by typing in your file name and click “Save.”

8. Under “Measure” press BKG (background). The “Please prepare sample compartment for background scan” window will pop up. Press “OK” to begin the scans. The measurement then takes place (as indicated by the bottom left hand corner “scanned x of # scans” or if the scans have been completed “FTIR measurement ready.”

9. For a solid sample place enough of the solid on the crystal surface to fully cover it. Move the arm back to the center, and twist the knob clockwise until it stops. If using a liquid sample put the liquid crystal plate on the instrument by screwing it on the crystal holder. Put a few drops of sample in the area over the crystal and leave the handle out of the way.

10. Under “Measure” press Sample. The scanning will automatically begin.

11. Once complete, the program automatically goes to “View.” The background is automatically subtracted out from the sample scan.

12. Under the Manipulation 1 drop down menu, select peak table (at bottom of selection). The parameters to the right can be changed to optimize peaks.

13. The peaks are displayed by selecting “Calc”. If you get too many peaks, reduce the parameters starting with changing just the minimum area to a larger number. The peak table is displayed by selecting OK.”

14. Selecting “OK” after performing any data manipulation will display the changes to the original data file. To save changes, go to file and either choose the option to save (which saves changes over the original spectra) or save as (which will save the changes as a new spectra).

15. Clean crystal plate and apparatus with cleaner and kimwipe and go on to next sample. If finished running samples, close out of the IRsolution software (if there is any unsaved data, a prompt will appear asking you to do so. Either select yes to save changes or no to get rid of them) and turn off the instrument using the power switch on front.