

I. Instrument name

Perkin Elmer Fourier Transform Infrared Spectrometer 1700 Series
SpectraTech IR-Plan Microscope

II. Suggested Uses

The FT-IR spectrometer combined with a microscope is used to identify and compare polymeric materials such as paints, fibers, plastics, explosives, etc.

III. Operating Procedure

A. Start-up

2. Place funnel in dewar and fill funnel with liquid nitrogen 2 - 3 times. Wait for "burp." Fill funnel until a slight overflow of nitrogen occurs. *Note: Be careful to avoid overflowing liquid nitrogen onto the microscope and the detector.* Replace the cap on the dewar.
2. Turn on the computer and open Spectrum For Windows. (Spectrum For Windows User's Reference manual can be used as a guide).
3. Login as a user or guest. Click on SETUP and pull down INSTRUMENT and click. (*Note: This instrument automatically initializes and will give a communications error message until the initialization is complete (about 30 seconds).*) The INSTRUMENT SETUP window will appear. Click on the BEAM icon and make sure the internal beam TGS detector is selected. Click on UPDATE. Make sure the SCAN MODE GAIN is set on "1" and then click on UPDATE.
4. Click on INSTRUMENT and pull down to MONITOR and click. Select ENERGY and click on OK. Record the maximum value in the user log under internal energy. Click on HALT.
5. Click on SETUP and pull down INSTRUMENT and click. When the INSTRUMENT SETUP window appears, click on the BEAM icon and select INTERNAL MCT detector and click on UPDATE. Click on UPDATE again in the INSTRUMENT SETUP window.
6. Turn on microscope (switch is on lower part of front) and maximize light (lever on lower right side). Switch upper and lower levers on microscope to VIEW. Remove the upper and lower adjustable apertures in the microscope and replace them with

the fixed apertures (*these are marked “upper” and “lower”*). Place a KBr disk into the sample holder on the microscope stage and focus on the top surface of the disk. Make sure the round holes in the apertures are perfectly aligned and focus the condenser if needed.

7. Switch both levers on the microscope to IR. Repeat step 4 and record the maximum value in the user log under external energy.
8. Replace the fixed apertures with the adjustable apertures.

B. Collection and Storage of Data

1. Place sample(s) to be scanned on a KBr disk; switch levers to VIEW and focus on the surface of the sample and then focus the condenser. Move adjustable apertures (bottom first, then top) to the appropriate size for the sample. Then move the stage so that the sample is not in view. Switch levers back to IR.
2. Click on INSTRUMENT and then click on BACKGROUND. Scan background the desired number of times. Switch levers on microscope to VIEW. Move stage to get sample back into the viewing area. Switch levers back to IR. (*Note: This instrument is set to close the background scan automatically. If the background scan needs to be saved, modification of the settings will have to be made prior to obtaining the background scan*).
3. Click on INSTRUMENT and then on SCAN SAMPLE. Give the scan a unique identifier. Placing information in the comments section is optional. Scan sample the desired number of times. Click on SAVE to place the spectrum in a file location in the computer. (*Note: It is essential to save the spectrum before closing it. If the window is closed before saving, the spectrum cannot be retrieved*).
4. Several data commands can be used to improve the quality of the spectrum. Refer to the [Spectrum for Windows User's Reference](#) for detailed information on how to use these functions. Be sure to SAVE the corrected spectrum before closing.

C. Shut Down

1. Save any necessary spectra.
2. Using procedures described under Start Up, change the detector back to internal TGS and set the gain back to “1” if it has been changed during use.
3. Exit Spectrum for Windows.

4. Exit Windows.
5. Turn off the computer.

IV. Safety Concerns

1. Use of controls and/or adjustments and the performance of procedures other than those noted in the user's manual may result in hazardous radiation exposure.
2. The instrument must be disconnected from all voltage sources before it is opened for any adjustment, replacement, maintenance, or repair.
3. Note any warning labels on the body of the Perkin Elmer 1700 Series (i. e. desiccant, beamsplitter, and laser radiation warnings).
4. The low temperature of liquid nitrogen can burn skin and eyes. Wear protective gloves and safety goggles when filling the dewar.
5. Be aware of pressure build up in the dewar. High pressure can forcefully propel a funnel or detector cap upward from the dewar. Allow sufficient time for the nitrogen overflow to dissipate and the pressure to stabilize before replacing the dewar cap.

V. Other Information

FT-IR manuals can be located in the FT-IR room as well in the Trace Evidence Library.