I. Instrument name

Perkin Elmer Spectrum 2000 FT-IR Spectrometer
Perkin Elmer *I*-Series FT-IR 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

1. Place funnel in dewar and fill funnel with liquid nitrogen 2 - 3 times. Wait for "burp." Fill the funnel approximately two more times. *Note: Be careful to avoid overflowing the nitrogen onto the microscope and the detector.* Replace the dewar cap and close the lid to the dewar compartment.

2. Turn on the computer and load Spectrum for Windows. (Spectrum for Windows User's Reference manual can be used as a guide).

3. Turn on the microscope (power switch is located behind the microscope; illuminator switch is turned on separately and is located in front of the microscope). Refer to I-Series FT-IR Microscope User's Reference for focusing the microscope.

4. After Spectrum for Windows is loaded, initialize the instrument on the internal detector (MIRTGS). Go to SETUP, INSTRUMENT, then click on BEAM to verify which detector is selected.

5. Initialize the instrument by clicking on INIT.

6. After initialization, check the internal energy. Go to INSTRUMENT, MONITOR, and chose ENERGY. Record the maximum value in the FT-IR logbook under internal energy.

7. Change the detector by clicking on SETUP, INSTRUMENT, BEAM. Switch from the TGS detector to the MCT (external) detector.

8. Place the 100µ aperture in the microscope. Move stage, if necessary, so that nothing is in the beam path. Switch from VIEW to IR on the microscope. Repeat step 6 and record the maximum value in the FT-IR logbook under external energy. *(Note: It may be necessary to adjust the condenser).*

B. Collection and Storage of Data

1. Replace 100μ aperture with adjustable aperture. Place sample(s) to be scanned on a KBr disk; switch knob on microscope to VIEW and focus on the surface of the sample and adjust aperture to the appropriate size for the sample.

2. Move stage so that the sample is not in the beam path. Switch knob on microscope from VIEW to IR.

3. Click on INSTRUMENT and then SCAN BACKGROUND. Scan background the desired number of times. Switch knob on microscope to VIEW. Move stage to get sample back into the viewing area. Switch knob 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).*

4. 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).*

5. 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 MIRTGS and set the gain back to "1" if it has been changed during use.

3. Exit Spectrum for Windows.

4. Exit Windows and leave computer on.

IV. Safety Concerns

1. Use of controls and/or adjustments and the performance of procedures other than those noted in the Spectrum 2000 User's Reference 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 2000 (i.e. desiccant, beamsplitter, spare beamsplitter, and laser radiation warnings).

4. The low temperature of liquid nitrogen can burn skin and eyes. Wear protective gloves and safety goggles whenever 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 equalize 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.