

**FOURIER TRANSFORM INFRARED SPECTROSCOPY (FTIR)**

**Photo of Instrument:**



<b>Instrument Name</b>	<b>Fourier Transform Infra-Red (FTIR)</b>
<b>Instrument Model &amp; Serial No.</b>	Spectrum Two
<b>Instrument Make</b>	Perkin Elmer
<b>Category of Instrument</b>	Characterization and Testing
<b>Description of Instrument</b>	FTIR is a technique used to obtain an infrared spectrum of absorption or emission of a solid, liquid, or gas.
<b>Instrument Technical Description and Major Specifications (This Specifications Limited to Major 5)</b>	Detector Type: LiTaO Operating Range: 5-45 Degree Celsius Wavelength: 8 Wavenumber- 350-8300cm-1
<b>Application of Instrument (Limited to Major 4 or 5)</b>	superior spectroscopic performance across a wide range of applications in chemicals, materials, pharmaceuticals, food, environment, and lubricants.

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**Type of Sample Required for  
Analysis / Testing (Quantity, Pre-  
Preparation, State etc.)  
Guidelines for Sample Submission  
– User Instructions**

### 1. LIQUIDS:

Place a small drop of the compound on one of the KBr plates. Place the second plate on top and make a quarter turn to obtain a nice even film. Place the plates into the sample holder and run a spectrum. If the sample is too concentrated, separate the plates and wipe one side clean before putting them back together.

The KBr plates must be thoroughly cleaned after this procedure to prevent contamination of future samples.

Wipe the windows with a tissue, then wash several times with methylene chloride (or another solvent that will take off your sample), then ethanol. Use the polishing kit in the lab to polish the window surface.

Wear gloves to prevent fogging.

The cleaned surface should be clear and free from scratches KBr pellets/disks (for solid samples).

In order to prepare a KBr pellet, follow the procedure given below:

Chemistry Analytical Lab FT-IR Spectroscopy

Sample preparation for FT-IR

Sample/KBr ratio

The concentration of the sample in KBr should be in the range of 0.2% to 1%. The pellet is much thicker

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than a liquid film, hence a lower concentration in the sample is required (Beer's Law). Too high a concentration usually causes difficulties obtaining clear pellets.

The IR beam is absorbed completely, or scattered from the sample which results in very noisy spectra.

Sample preparation.

Although a homogeneous mixture will give the best results, excessive grinding of the potassium bromide is not required.

The finely powdered potassium bromide will absorb more humidity (it is hygroscopic) from the air and therefore, lead to an increased background in certain ranges.

Make sure to work fast. Transfer some KBr out of the oven (ATTENTION: the oven is at 100°C - you can easily burn yourself!) into a mortar.

Add about 1 to 2 % of your sample, mix and grind to a fine powder. For very hard samples, add the sample first, grind, add KBr and then grind again.

The sample must be very finely ground as in the Nujol mulling technique to reduce scattering losses and absorptionband distortions.

Take two stainless steel disks out of the desiccator.

Place a piece of the precut cardboard (in the tin can

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	<p>next to the oven) on top of one disk and fill the cutout hole with the finely ground mixture. Put the second stainless steeldisk on top and transfer the sandwich onto the pistil in the hydraulic press. With a pumping movement, move the hydraulic pump handle downward.</p> <p>The pistil will start to move upward until it reaches the top of the pump chamber. Then, move the pump handle upwards and pump until the pressure reaches 20,000 prf. Leave for a few seconds and with the small lever on the left side, release the pressure (hold until the sample and pistil are all the way down).</p> <p>Remove the disks and pull apart. Remove the film, which should be homogenous and transparent in appearance. Insert into the IR sample holder and attach with scotch tape. Run the spectrum.</p>
<b>Types of Analysis / Testing</b>	An analytical technique that measures how infrared light is absorbed by a sample material. It can identify organic and some inorganic materials.
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<b>Location of Instrument</b>	Environmental Engineering Research lab
<b>Other Details</b>	

### User Charges:

<b>S.NO.</b>	<b>Type of Analysis / Testing</b>	<b>Internal - within Department of NITC</b>	<b>Internal - Other Departments NITC</b>	<b>External Academic Educational Institutes</b>	<b>National R&amp;D Labs</b>	<b>Industry</b>
1		300 per sample	300 per sample	600 per sample	600 per sample	1200 per sample

### Slot Booking and Payment Work Flow: