

Spectros Associates Proudly Presents the One Day Short Course

Fundamentals of FTIR

Instructor: Dr. Brian C. Smith

A 1 day introduction to FTIR, an important chemical analysis technique. The course covers how an FTIR works, how to measure data and instrument quality, manipulating spectra to gain more information, and how to use an infrared microscope. The course is based upon the 200 page hardcover textbook "Fundamentals of FTIR" written by Dr. Smith and published by CRC Press.

I. The Basics of FTIR

- A. Introduction to Infrared Spectroscopy**
 - 1. The Properties of Light
 - 2. What is an Infrared Spectrum?
 - 3. Infrared Spectroscopy: Good and Bad Points
- B. The Advantages of FT-IR**
 - 1. Signal-to-Noise Ratio (SNR)
 - 2. The Throughput Advantage
 - 3. The Multiplex Advantage
- C. The Disadvantage of FTIR: Water and CO₂ Peaks**

II. How an FT-IR Works

- A. Interferometers & Interferograms**
- B. How a Spectrum is Produced**
 - 1. The Fourier Transform
 - 2. Background & Single Beam Spectra
- C. Optimizing Resolution & Minimizing Noise**
- D. FTIR Hardware**
 - 1. Infrared Sources
 - 2. Beamsplitters
 - 3. Detectors
 - 4. The He-Ne Laser
- E. Measuring Spectral & Instrument Quality**

III. Spectral Manipulations: Handling Mixture Spectra

- A. The Laws of Spectral Manipulation**
- B. Spectral Subtraction**
 - 1. Theory
 - 2. Optimizing Subtraction Results
 - 3. Spotting Artifacts
- C. Library Searching**
 - 1. Background & Theory
 - 2. The Search Process
 - 3. Properly Interpreting Search Results
 - 4. Subtract & Search Again: The Analysis of Mixtures

IV. Infrared Microscopes

A. How an Infrared Microscope Works

B. Preparing Samples

C. Applications

Wrap-up. Time for individual consultations and questions.

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