

IlluminatIR Training Agenda

Daily class start time: 9:00am-5:00pm

1. Introduction
2. Microscopy Fundamentals
 - Light Microscope
 - Discussion of optics
 - Illumination system
 - Condensers
 - Light Microscope Objectives and Eyepieces
 - Microscope Alignment
3. Infrared Microprobe Analysis
 - Light Microscope
 - Why Use an Infrared Microprobe?
 - Types of infrared microprobe objectives
 - i. All-Reflecting objective (ARO)
 - ii. Attenuated-total-reflection (ATR) objective
4. Software Introduction
 - Hardware Description
 - SynchronizIR Software
 - Camera Software
 - GRAMS Software
 - Acquiring a Sample Spectrum
 - i. ARO Objective
 - ii. ATR Objective
 - Spectral Quality
 - i. Identifying Quality Spectra
 - ii. Spectral Artifacts
5. Sample Preparation
 - Preparation of samples for microscopic examination
 - i. Dry mounts
 - ii. Mounts in different oils

- iii. Dispersion in KBr
- Preparation of samples for infrared microprobe analysis
 - iv. Reflection-Absorption Spectroscopy
 - v. ATR Spectroscopy
- Collect three spectra for use on day two with no libraries for comparison
 - vi. Long Chain Hydrocarbon
 - vii. Functional-group variation of a long-chain hydrocarbon
 - viii. carbonyl-containing compound

6. Data Analysis

- Spectroscopy Fundamentals
 - i. Infrared Spectroscopy
 - ii. Generating an Infrared Spectrum
- Instrument Calibration and Performance Check
 - i. What checks are performed
 - ii. Reports Generated
- Spectral Interpretation
 - i. Spectral Quality
 - ii. Functional Groups
 - iii. Characteristic Absorption Regions
 - iv. Recognizing Common Spectra
- Optical Microscopy
- Run more samples
 - i. Nylon
 - i. Gelatin
 - ii. Aromatic (Benzoic Acid, polystyrene)

7. Software Topics

- Software Setup
 - i. Methods, Instrument Parameters
 - ii. Infrared Spectroscopy
 - iii. GRAMS Data Manipulation Utilities
- Library Maintenance
 - i. Library Setup
 - ii. Library Searching
 - iii. ATR and ARO Searching
 - iv. ATR Correction
 - v. Spectral ID (SPECID) Software
- Mixture Analysis
- User Specific Applications