

# IlluminatIR Training

## Danbury, CT

### September 22, 23 & 24, 2009

To register for the class please contact Chantel Javois at [Chantel.Javois@smithsdetection.com](mailto:Chantel.Javois@smithsdetection.com) or 203-207-9778.

**Location:** Smiths Detection  
21 Commerce Drive  
Danbury, CT 06810

**Class time:** 9:00am-5:00pm

**Agenda :**

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

## **HOTEL INFORMATION**

Smiths Detection - Danbury has a corporate rate of \$125.00 a night available at the Courtyard Marriott. Please be sure to mention Smiths Detection to receive this rate.

Danbury Courtyard Marriott  
3 Eagle Road  
Danbury, CT 06810  
1-203-730-2228

<http://www.marriott.com/dpp/PropertyPage.asp?MarshaCode=DXRCY>

Smiths Detection - Danbury has a corporate rate of \$109.00 a night available at the Danbury Holiday Inn. A buffet breakfast is included. Please be sure to mention Smiths Detection to receive this rate.

Danbury Holiday Inn  
80 Newtown Rd  
Danbury, CT 0681  
1-203-792-4000  
1-888-452-5772

<http://www.danburyholidayinn.com/>

## **Directions to the Hotel:**

From 84 East:

- Take Exit 8
- At the light take a right
- At the 2<sup>nd</sup> traffic light take a right onto Eagle Road.
  - Take your first left into The Holiday Inn.
  - The Courtyard Marriott is on your right.

From 84 West:

- Exit 8 – continue straight onto Newtown Road– get into middle lane
- At the 4<sup>th</sup> set of lights take a right onto Eagle Road.
  - Take your first left into The Holiday Inn.
  - The Courtyard Marriott is on your right.

## **Directions to Smiths Detection**

From 84 East:

- Take Exit 8
- At the light take a right

- At the 2<sup>nd</sup> traffic light take a right onto Eagle Road.
- Take your first left onto Commerce Drive.
- We are the last building on the left number 21.

From 84 West:

- Exit 8 – continue straight onto Newtown Road– get into middle lane
- At the 3<sup>rd</sup> set of lights take a right onto Eagle Road.
- Take your first left onto Commerce Drive.
- We are the last building on the left number 21.

From the Holiday Inn

- Take a left out of the parking lot.
- Take your first left onto Commerce Drive.
- We are the last building on the left number 21.

From the Courtyard Marriott

- Take a right out of the parking lot.
- Take your first left onto Commerce Drive.
- We are the last building on the left number 21.

## **Airports:**

Bradley International Airport (BDL) Hartford, CT  
Westchester County Airport (HPN) White Plains, NY  
LaGuardia Airport (LGA) Queens, NY  
John F. Kennedy Airport (JFK) New York, NY