

Spectros Associates Proudly Presents the One Day Short Course

Principles of Chromatography and Spectroscopy

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A 1-day introduction to two of the most important chemical analysis techniques, Chromatography and Spectroscopy. After a brief introduction on how to optimize instrumental analyses, the theory behind how a chromatograph separates mixtures is discussed. Then, you will see how to apply this information to optimize gas and liquid chromatographic separations. The spectroscopy portion begins with the properties of light. Then, how an FTIR works, how to prepare samples for infrared analysis, and how to use infrared spectra to identify molecules is discussed. After an introduction to Ultraviolet/Visible (UV/Vis) spectroscopy, the course finishes with how to correctly use spectroscopic measurements to quantitate the concentrations of molecules in unknown samples.

I. What is Analytical Chemistry?

- A. Optimizing Analyses**
- B. Becoming a Problem Solver**

II. Quantifying Measurement Error

- A. Random Error**
 - 1. Signal-to-Noise Ratios**
 - 2. Getting Rid of Noise**
- B. Systematic Error**
- C. Precision and Accuracy**
- D. Calibrations**
 - 1. Calibration Checks**
 - 2. Calibration Applicability**

III. Introduction to Chromatography

- A. Basic Theory**
- B. Modeling a Separation**
- C. Peak Widths**
- D. Resolution**
- E. Optimizing Separations**
- F. Gas Chromatography (GC)**
- G. High Pressure Liquid Chromatography (HPLC)**

IV. Principles of Spectroscopy

- A. The Properties of Light**
- B. Fourier Transform Infrared Spectroscopy (FTIR)**

- 1. Instrumentation**
- 2. Sample Preparation: ATR**
- C. Ultraviolet-Visible (UV-Vis) Spectroscopy**
 - 1. Theory**
 - 2. Instrumentation**

V. Quantitative Spectroscopy

- A. Beer's Law**
- B. Variables to Control and Pitfalls to Avoid**
- C. Calibration and Prediction**

Wrap-up. Time for individual consultations and questions.