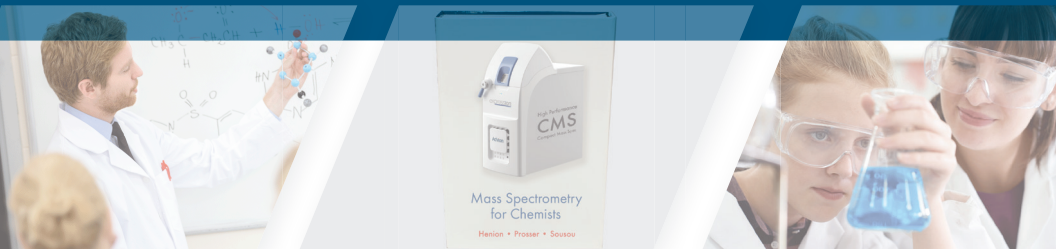


Advion



Teaching Mass Spectrometry For Chemists

Bringing Mass Spectrometry into the Classroom with a
Training Course for the expression CMS



Advion.com/TeachingChemistry · info@advion.com

Bring Mass Spectrometry into Your Classroom

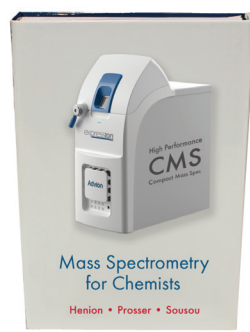
Provide students with mass spec expertise and experience with a curriculum specifically designed for the **expression**[®] Compact Mass Spectrometer (CMS), the standard for mass analysis in chemistry labs worldwide.

- The **expression** Compact Mass Spectrometer is available with a training course to help professors prepare students for careers in industry and academia with real-world knowledge and experience in mass spectrometry.

A research-grade mass spec, the **expression** CMS is also ideal for teaching because of its small size, ease of use, and one-click software. When class is not in session, the system is ideal for research projects, making this a versatile choice for university labs seeking state of the art equipment paired with streamlined teaching modules.

To bring mass spectrometry in the classroom, Advion offers:

- A compact, easy-to-use benchtop mass spectrometer for both students and researchers
- Five hours of recorded lectures that go beyond the fundamentals of mass spectrometry to include various sample techniques, showing students real world examples used in the chemistry workplace
- Lecture slides to share or adapt to your own teaching style



Comprehensive Lecture Materials

This teaching package includes ready-to-teach curriculum, making it the ideal solution for undergraduate and teaching chemistry programs.

Lectures include:

- Introduction to Mass Spectrometry
- Flow Injection Analysis
- Direct Probe Sample Introduction
- Plate Express TLC Plate Reader
- LC/MS Techniques
- Other Compact Mass Spec Applications & Techniques

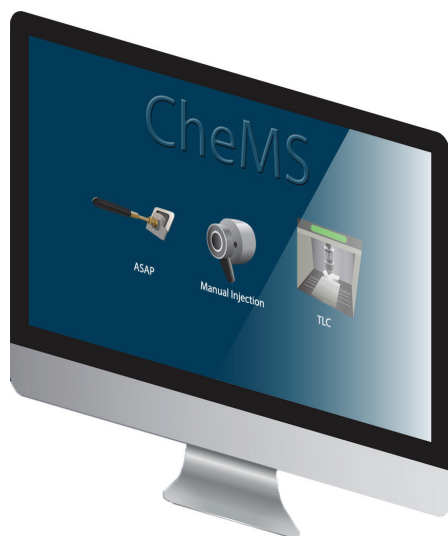


"Well suited for a variety of undergraduate curricular and research lab applications."

Paul Anthony Flowers, PhD
University of North Carolina at Pembroke, Chemistry

CheMS: Easy, Student-friendly Software

The streamlined CheMS software is ideal for teaching applications. The interface simplifies the mass spectrometry experience, allowing users to quickly select the workflow and type of compounds they wish to analyze in just a few clicks of the mouse. The software automatically optimizes the ion source and data acquisition parameters to ensure optimum performance without needing to be an expert in mass spectrometry.



Maximize the Education Experience

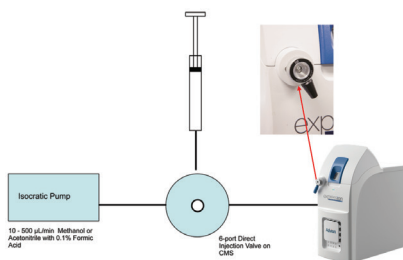
Students can learn a variety of mass spec introduction techniques from flow injection to liquid chromatography.

Flow Injection Analysis

Direct syringe injection is one of the simplest and fastest methods of sample introduction into a mass spectrometer.

This lecture highlights:

- Direct injection including sample concentration guidelines
- An introduction to ESI and APCI ion sources
- Generation and interpretation of mass spectra
- Solvent considerations and examples



Liquid Chromatography/Mass Spectrometry

Advion's HPLC and UHPLC modular chromatography systems can be configured with a wide range of options to provide flexible LC-MS to meet your needs, from the simplest manual injection HPLC to a fully automated, streamlined UHPLC system and everything in-between. The **expression** CMS can also integrate with over 250 LC systems from other vendors if you want to interface to a pre-existing LC system.

This lecture highlights:

- An introduction to liquid chromatography
- Mobile Phase flow rates and composition
- Solvent details

Direct Probe Sample Introduction

The Atmospheric Solids Analysis Probe (ASAP®) allows for direct analysis of liquids and solid samples with no sample preparation, right at the bench. Get mass spectra in < 30 seconds.

This lecture highlights:

- Introduction to the ASAP and APCI ion source
- Positive and negative ion switching
- Effects of temperature and gas flow
- Drug analysis, reaction monitoring, explosive residue screening examples



"The expression CMS has allowed us to provide practical training in LC/MS for our undergraduate students at a time when prospective employers are actively seeking such skills."

Kevin Welham, PhD
University of Hull, Chemistry

Plate Express TLC Plate Reader

Thin layer chromatography (TLC) is a widely-used technique in nearly all chemistry labs. The Plate Express™ TLC Plate reader provides a simple, automated means of obtaining mass spectra directly from TLC plates, creating a technique known as TLC/CMS. Identify TLC spots without scraping in < 1 minute.

- This lecture highlights:
- TLC/CMS introduction and overview
- Normal phase and reversed-phase TLC plates
- Solvents and buffers
- Reaction monitoring and analysis of mixture examples



Options to Suit Your Lab

expression^S
CMS

With electrospray (ESI) and atmospheric pressure chemical ionization (APCI) ion sources and a mass range of 10 – 1,200 m/z units, the **expression^S** is a versatile, compact mass detector designed with the chemist in mind.

Reaction monitoring

- For batch and flow chemistry
- Fast compound identification and purity determination
- Little or no sample preparation required with many novel sample introduction interfaces

Purification

For mass-directed fraction collection with all:

- Flash chromatography systems
- Prep-LC systems
- SFC systems

High performance Mass Spectrometer for many other applications:

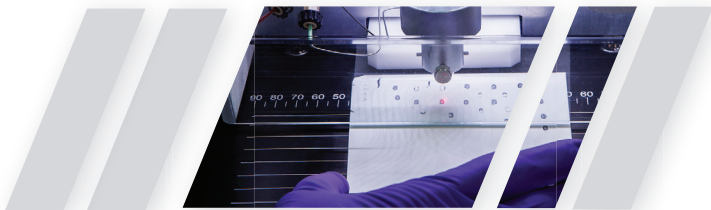
- Food safety and ingredients analysis
- Forensics
- Water purity
- Clinical Diagnostics

Size and Design Matter

- The first mass spec to fit in a fume hood; enabled by its patented atmospheric pressure ionization interface.
- All critical and commonly used components are located on the front of the instrument for easy access.
- Pump and source exhaust are bi-directional (left or right hand) to allow for optimal hood or bench location.
- Solvent-resistant exterior package.

A Complete Benchtop Solution

The **expression** CMS with the Plate Express TLC plate reader, customizable (U)HPLC, the ASAP and iASAP probes for liquids, solids and even inert compounds, the Touch Express Open Port Sampling Interface (OPSI) plus a direct injection interface - all at the bench.



expression^L CMS

With a mass range of 2,000 m/z , the expression^L is the ideal mass detector for biochemistry and other large molecules applications.

- Natural products
- Peptides
- Proteins
- Oligonucleotides
- Polymers

Many biomolecules carry multiple charges when they ionize so that even proteins of several tens of kDa can be measured with the 2,000 m/z range. Advion's proprietary deconvolution software algorithms provide fast and accurate determination of the molecular mass of multiply charged species.



Experience the full expression CMS suite

The expression family of compact mass spectrometers was developed with maximum versatility in mind. They allow users to switch rapidly between the many different sample introduction techniques required throughout the chemist's workflow; from simple direct probe analysis to ultra-high performance liquid chromatography and prep-scale purification.



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