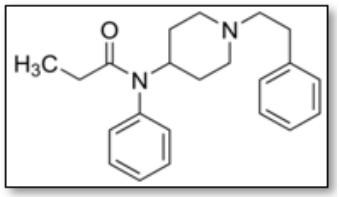
APPLICATION NOTE

Compact Mass Spectrometers: Controlled Substance Detection

Fast, reliable and sensitive instrumentation for controlled substance analysis.

The landscape of controlled substance analysis is changing with compact mass spectrometers. BaySpec's Portability™ and Continuity™ mass spectrometer series offers a new way to approach controlled substance analysis. No longer do the samples need to go to the lab, but now the lab can go to the samples. With the growing risk of exposure to fentanyl and its analogues, there is a need in law enforcement and decontamination services for analysis that is fast, dependable and can be operated with little to no training.



Chemical Structure of Fentanyl

Law enforcement agencies have been using chemical field tests as a presumptive test for the presence of controlled substances for decades. Not only are the field tests unreliable and not admissible in many jurisdictions, but it has become increasingly relied upon to negotiate plea deals. Additionally, there is now an increased risk of exposure in performing the tests on site. Instead of a preliminary analysis, some agencies are opting to send the samples directly to a laboratory, where there can be a significant delay for results. Sites undergoing decontamination are rendered unusable until the remediation process is complete. If the site is contaminated, numerous sample sets will be sent to a laboratory for a single site until the contamination is below a set threshold, costing both valuable time and money. Each time a sample set is sent to a laboratory, the results need to be obtained before proceeding, costing yet more time and financial resources.

Portability™ and Continuity™ offer real-time analysis at the site. These devices are a compact solution with high sensitivity based on BaySpec's proprietary custom vacuum design and cutting-edge linear ion trap. The revolutionary technology of the linear ion trap mass analyzer allows for the compact size of the instrumentation while still maintaining laboratory quality performance, which is made possible by its high tolerance of low vacuum. The instrumentation offers a vital alternative to the unreliable field tests and costly practice of sending multiple sets of samples to an outside laboratory with its flexibility to perform analysis in virtually any location, dramatically reducing or eliminating the need for outside laboratories.

Portability™ is the smallest of the series and is designed for field-analysis. It is rapidly deployed and can perform trace-level detection at levels less than 10 parts per billion within seconds using direct atmospheric sampling. Continuity™ offers even greater sensitivity at 0.1 parts per billion and has the capability for tandem mass spectrometry (MS/MS) which allows for additional fragmentation and further identification of molecules. Both Portability™ and Continuity™ are compatible with other *in situ* and real-time ionization methods such as electron impact (EI), electro spray ionization (ESI) and other ambient ionization techniques.

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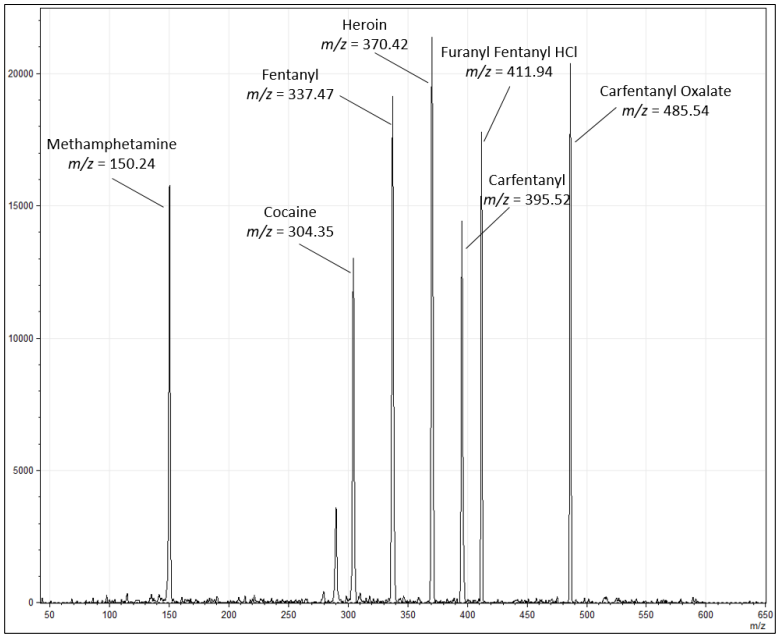
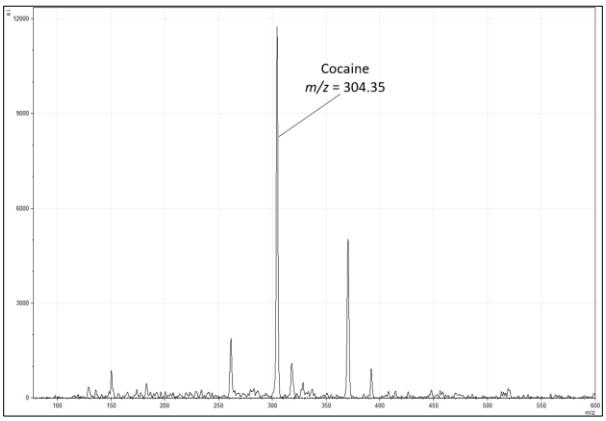
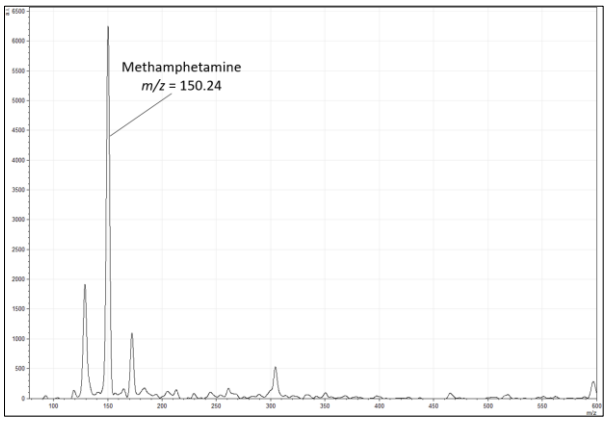
Portability™ (left) is a portable mass spectrometer weighing only 20 pounds, designed for use anywhere by those at any experience level. Continuity™ (right) is a compact mass spectrometer weighing just 40 pounds with high sensitivity and MS/MS capabilities. Both instruments have an embedded touchscreen PC for ease and convenience.







Pictured: Top– compilation of various controlled substance spectra. Bottom Left– Cocaine spectra. Bottom Right – Methamphetamine Spectra.

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