Waters™

Note d'application

High Field Asymmetric Waveform Ion Mobility Spectrometry (FAIMS) for Waters Micromass Mass Spectrometers

Waters Corporation, Ionalytics Corporation

This is an Application Brief and does not contain a detailed Experimental section.

For research use only. Not for use in diagnostic procedures.

Abstract

The Ionalytics Selectra offers researchers within the proteomics and drug discovery fields a unique tool to enhance their analyses. Using a dynamic ionfiltering mechanism, the Ionalytics Selectra improves the performance of mass spectrometers in both qualitative and quantitative applications by providing an additional dimension of ion separation. The outcome is clearer analytical results provided by reduced chemical background, separation of isobaric interferences, and improved detection limits in LC-MS applications.

Benefits

- Enhanced Mass Spectrometer Performance
- Improved detection limits
- Additional fractionation of mixtures
- Separation of isobaric components

- Simplified Mass Spectra

- Removal of unwanted background ions
- Fewer solvent related peaks
- Analyte peaks dominate the mass spectrum

- Wide Application Range

- Enhanced detection of low abundance components
- Analysis of molecular conformers
- Accurate and quantitative results

Introduction

The Ionalytics Selectra Provides Reduced Background and Enhanced Selectivity on Your Mass Spectrometer

The Ionalytics Selectra offers researchers within the proteomics and drug discovery fields a unique tool to enhance their analyses. Using a dynamic ionfiltering mechanism, the Ionalytics Selectra improves the performance of mass spectrometers in both qualitative and quantitative applications by providing an additional dimension of ion separation. The outcome is clearer analytical results provided by reduced chemical background, separation of isobaric interferences, and improved detection limits in LC-MS applications.

Operating at ambient conditions, the Ionalytics Selectra is easily installed between an existing atmospheric pressure ionization source and mass spectrometer with minimal disruption to instrument configurations.

Its unique ion-focusing mechanism maintains analyte intensity while its post-source placement reduces chemical background.

The Waters Micromass Q-Tof micro Mass Spectrometer.

Results and Discussion

The Ionalytics Selectra is based on FAIMS (high-Field Asymmetric waveform Ion Mobility Spectrometry) technology, which utilizes differences in an ion's mobility under conditions of high and low electric field strengths.

How does the Selectra work?

- A mixture of ions is introduced between two closely-spaced cylindrical electrodes and a flow of carrier gas transports the ions along this analyzer to the orifice of the mass spectrometer
- A high-voltage asymmetric waveform is applied to the electrodes to cause the ions to oscillate in the alternating strong and weak electric fields
- Ions drift toward an electrode at compound specific rates, based on their unique differences in mobility in strong and weak electric fields
- A compensation voltage is applied to the electrodes to stop the drift of selected ions. These ions are transmitted and others collide with the electrodes
- The selectively transmitted ions are a sub-set of the original mixture, so the mass spectrum is simplified

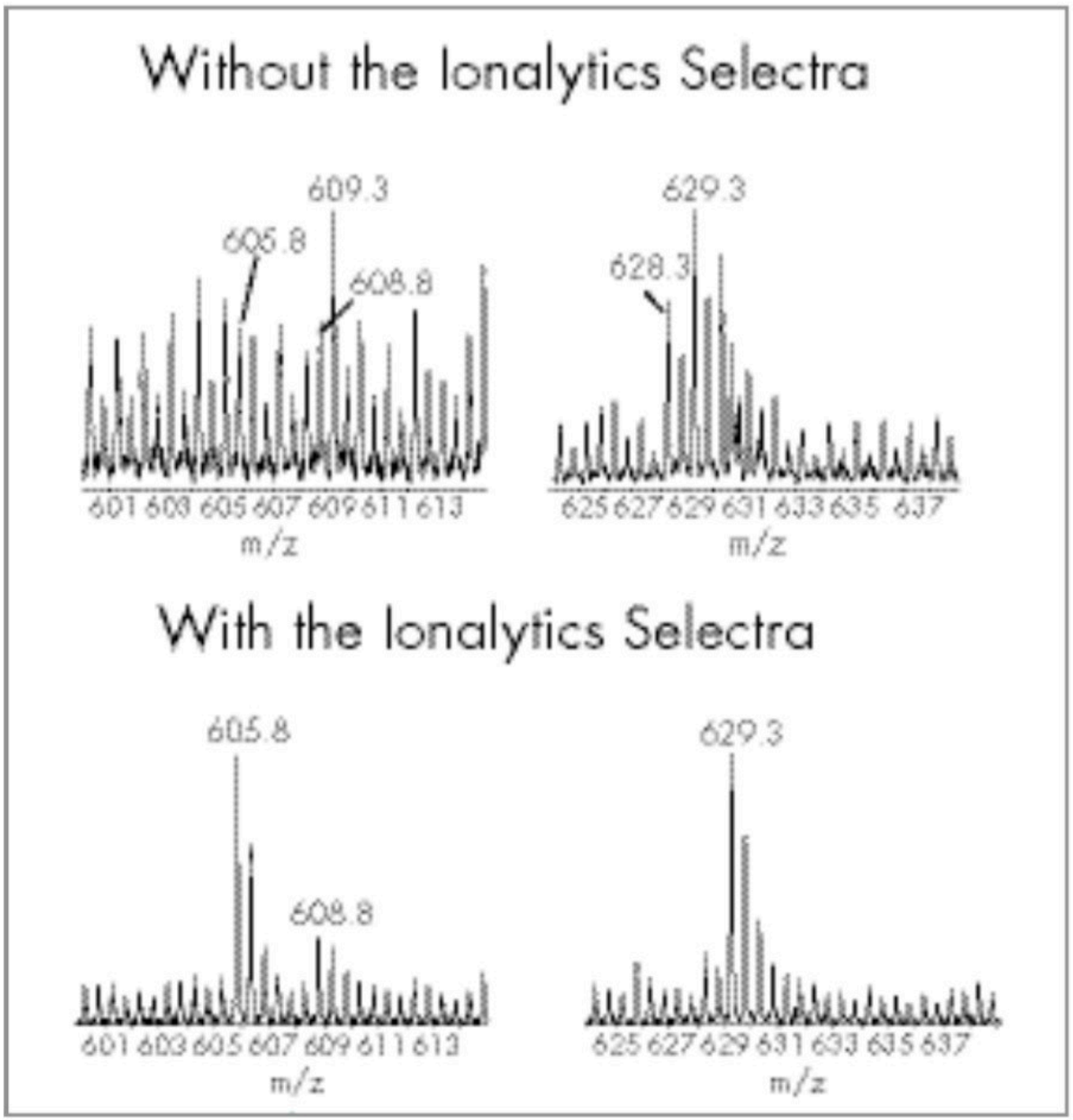

Figure 1. Analysis of a complex tryptic digest of U937 macrophage cells without and with the Ionalytics Selectra. The reduced background provided by the Ionalytics Selectra means low abundance peptides are more easily detected and identified. (Data courtesy of Pierre Thibault, Caprion Pharmaceuticals, Montreal, Quebec, Canada).

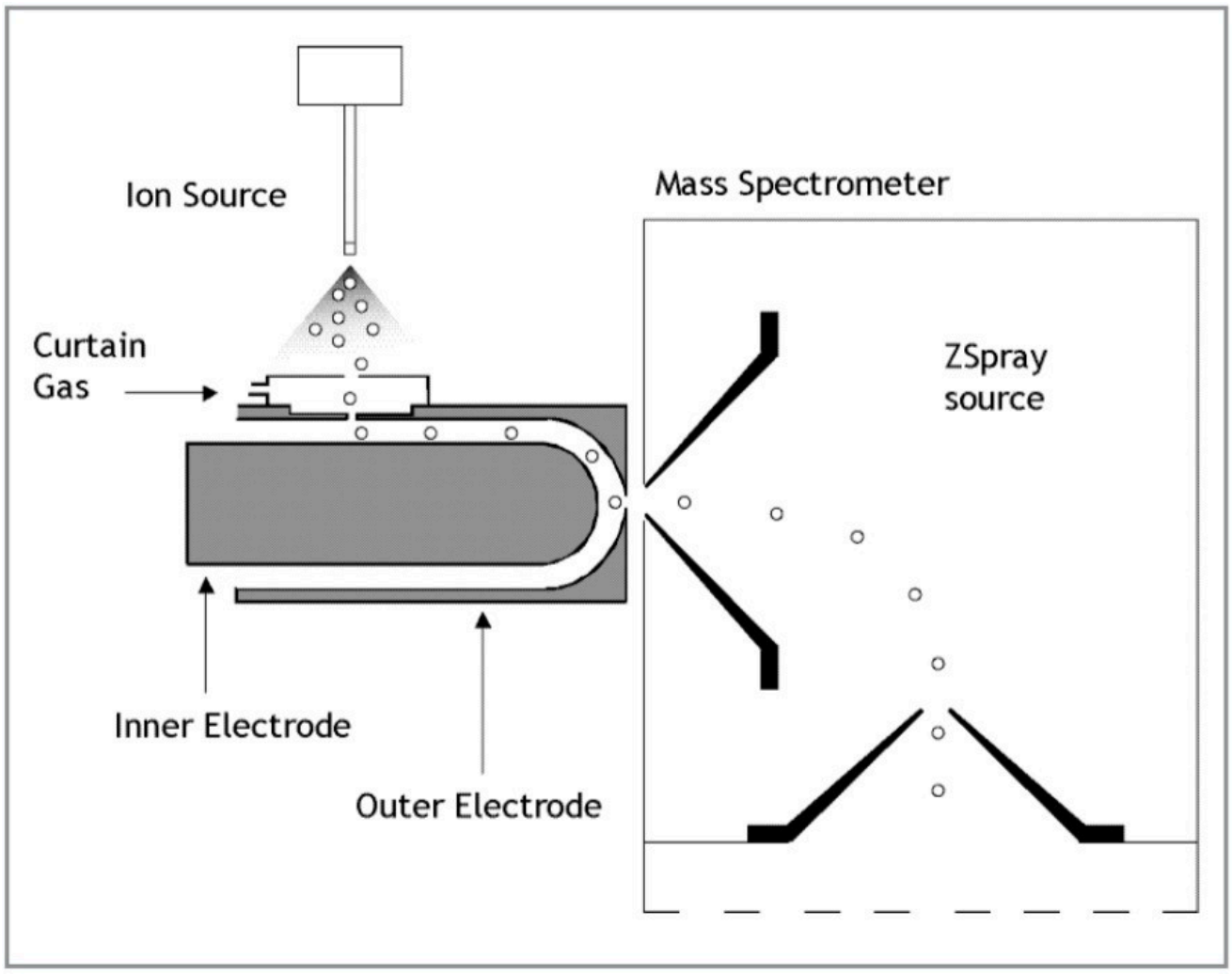

Figure 2. Integration of the Ionalytics Selectra with Waters Micromass mass spectrometers.

720000850, May 2004