

# Application Note



Time-Of-Flight Mass Spectrometry Instrumentation by FAST ComTec

## ALBATROS Electrospray Ionization TOF Mass Spectrometer - Setting a record in Mass-Resolution

by Thorald Bergmann, June 1999



The main components of the ALBATROS Esi-ToF are shown below. The ion source, which can be ion-spray, nano-spray, or any other source of positive or negative ions operating at atmospheric pressure produces the ions to be analyzed by the instrument.

After passing differential pumping stages symbolized by the skimmer and the apertures, the ions are injected orthogonally into the time-of-flight mass spectrometer.

In normal mode of operation the ion gate is open,

and there is no gas in the collision cell.

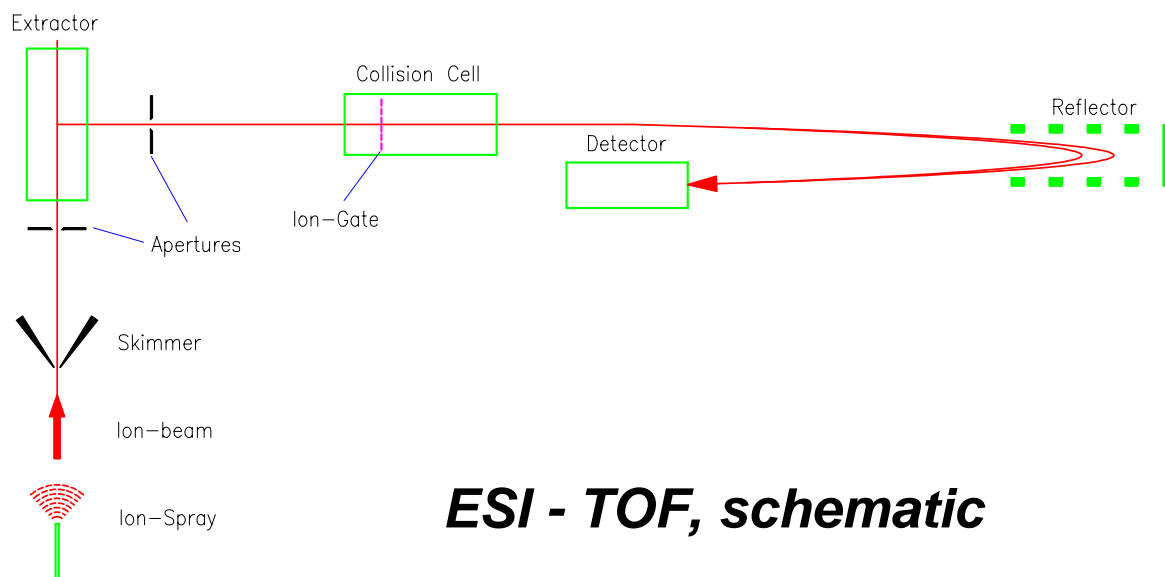
Then the ions pass unhindered into the reflector and detector of the mass analyzer.

To perform MS/MS experiments, there is a collision cell and an ion gate at the Wiley-McLaren focus.

Here a packet of ions is selected, which is then broken up in the collision gas.

The reflector then analyses the fragments.

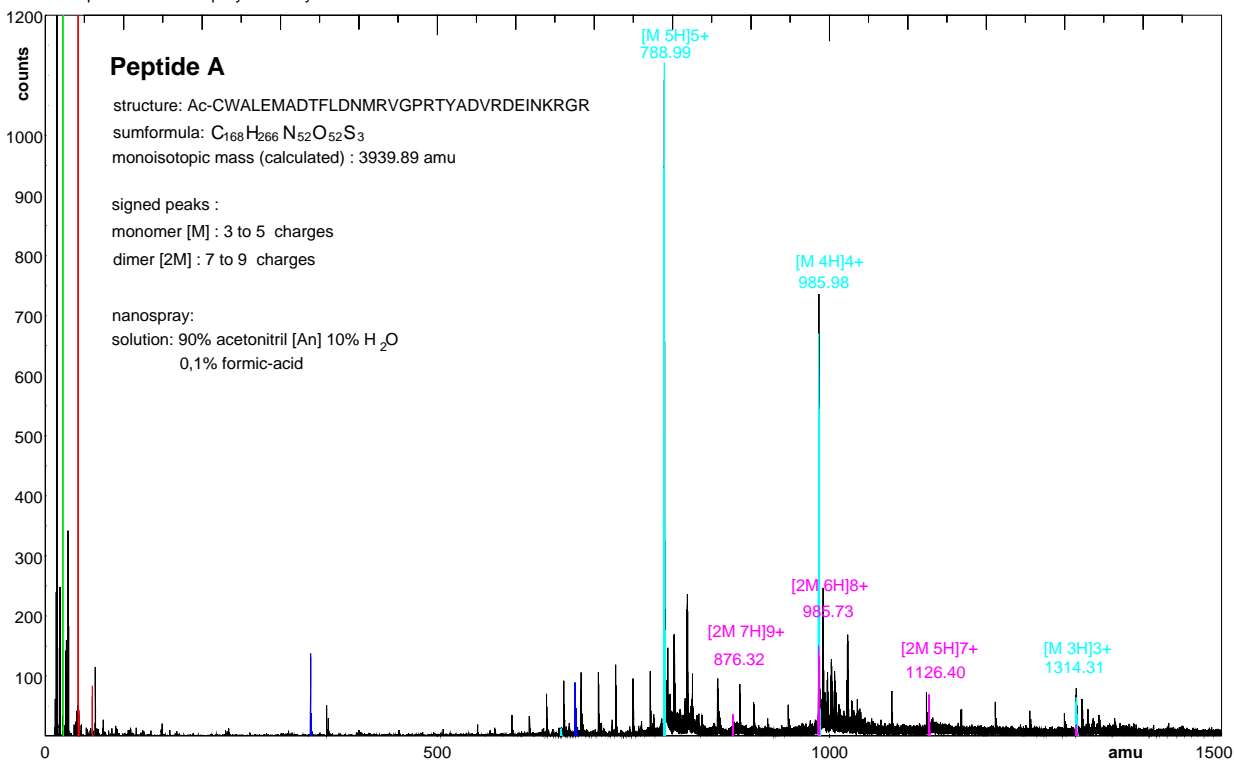
All spectra shown on the following pages were recorded with a FAST ComTec Model 7886A



### ESI - TOF, schematic

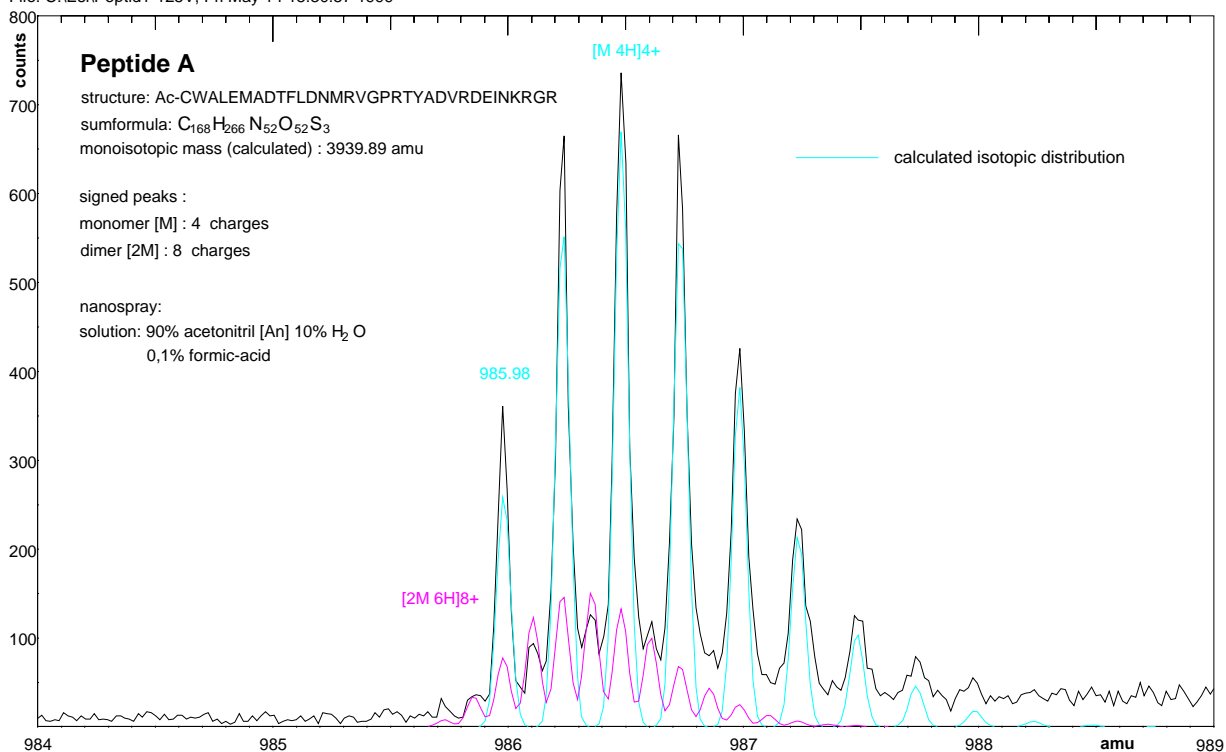
This is a complete spectrum of peptide A.  
It shows the 3-, 4-, and 5-fold charged monomer,  
and the 7-, 8-, and 9-fold charged dimer of this peptide.

ESI TOF-spectrum + nanospray: Fri May 14 18:30:57 1999



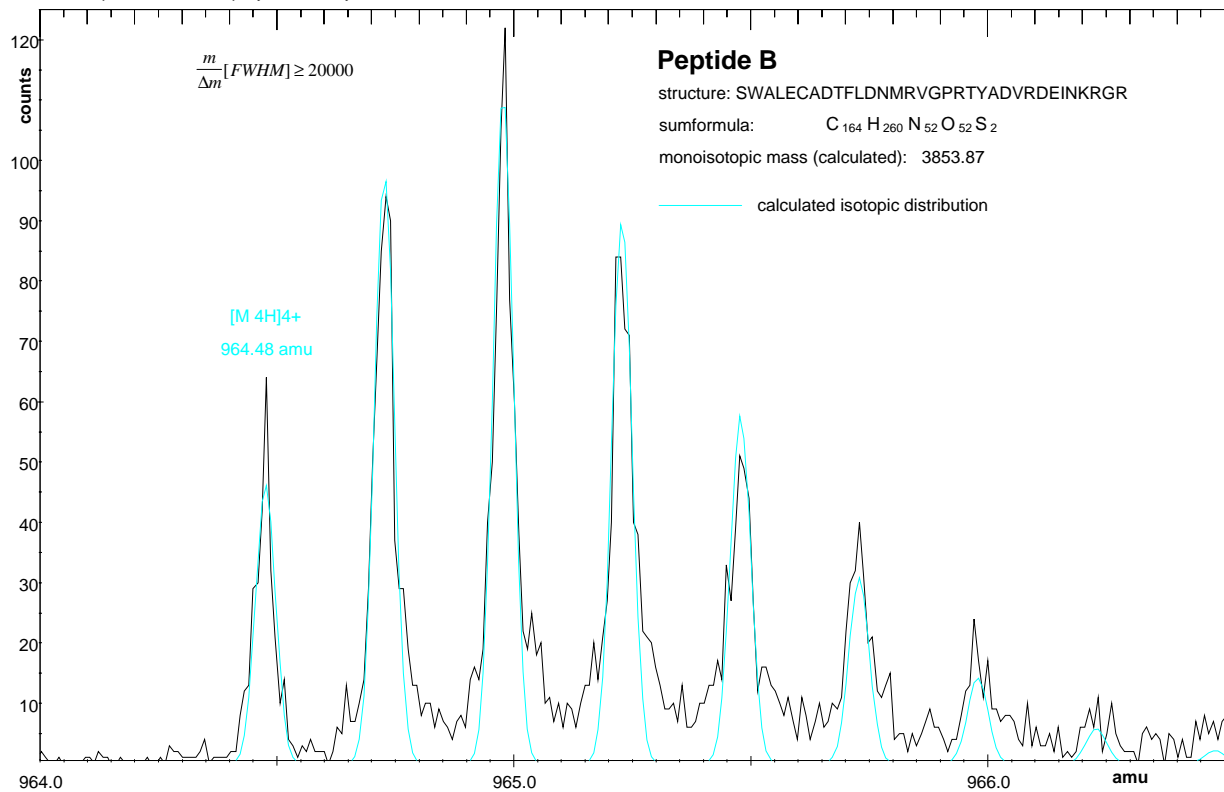
This spectrum shows the 4-fold charged monomer  
of peptide A above the 8-fold charged dimer.

File: C:\Esi\Peptid1-125V, Fri May 14 18:30:57 1999



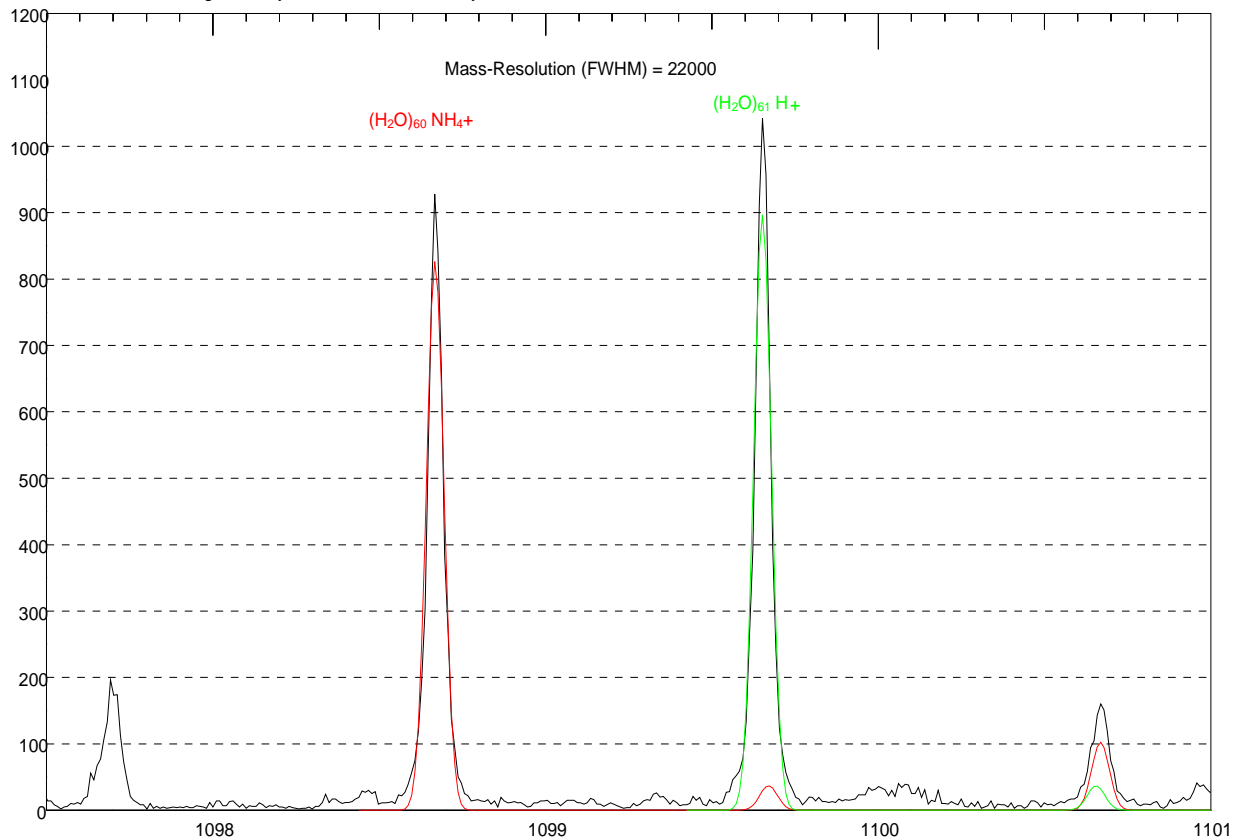
This is the four-fold charged peak of another peptide (B) of mass 3853.87 amu measured with a mass resolution > 20000 (FWHM)

ESI TOF - spectrum + nanospray: Wed May 19 10:31:09 1999

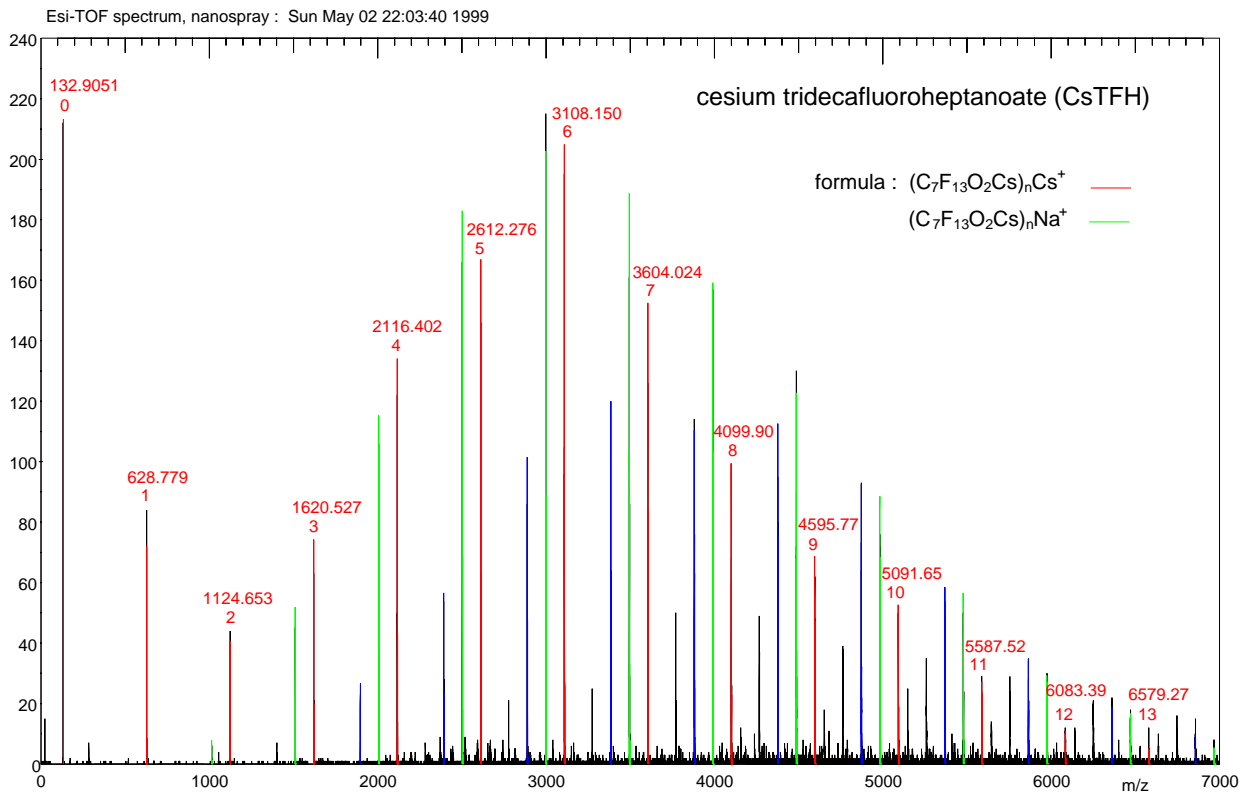


These are two water cluster peaks at a mass resolution above 22000 (FWHM)

File: C:\Esi\Resolution\HighMassHyAmWa\_22000, Mon May 17 16:04:45 1999



This spectrum shows the Cs/Na salt of tridecafluoroheptanoic acid. While the intention was to produce the pure Cs salt, mass spectrometric analysis shows the influx of Na contamination (green and blue lines).



This is a PPG-spectrum. The singly charged species are marked with blue, the double charged species are violet, the triply charged molecules are red.

