Application Note: 1401

Using AP-MALDI on an AB Sciex Triple-TOF 5600 System

Berk Oktem, MassTech

Introduction

MassTech's AP-MALDI source is available for both the AB Sciex Triple TOF and QTRAP class MS systems. This note describes possible uses of the AP-MALDI technology with a high repetition rate laser on a Triple-TOF 5600 system.

AP-MALDI Parameters

Laser Repetition Rate: 1 kHz
Laser Energy: ~20 µJ with 300 µm fiber
~5 µJ with 100 µm fiber
Spot Size: Standard
PDF: OFF

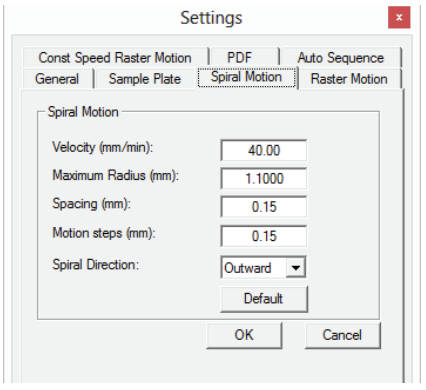

Figure 1: AP-MALDI Spiral Motion Parameters

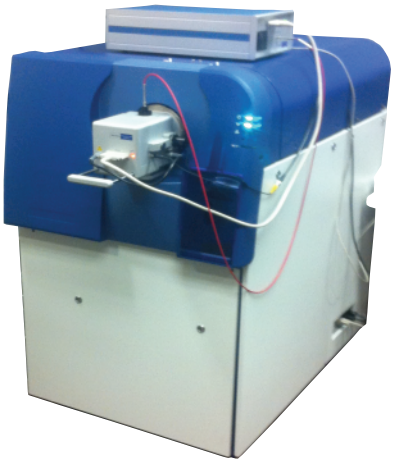

Figure 2: Experimental Setup

MS Parameters

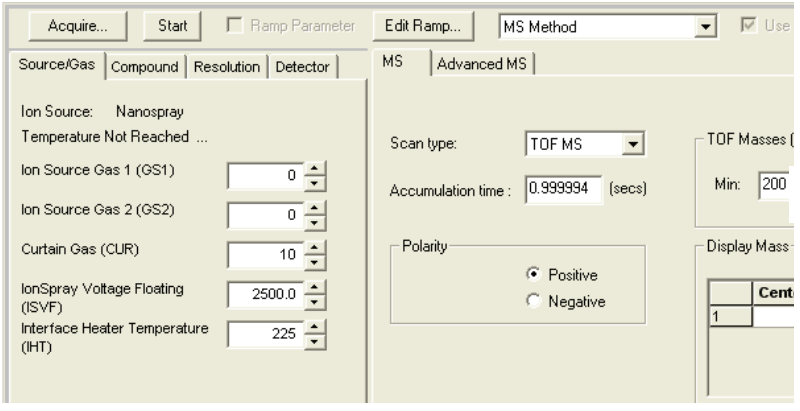

Figure 3: MS Parameters

Note: The 'Nanospray kit' was installed on the AB Sciex Triple TOF 5600 MS prior to AP-MALDI interfacing.

Keywords:

AP MALDI
AB Sciex
TripleTOF

Peptide Analysis

Human [Glu[1]]-Fibrinopeptide B (MW:1570.57) was used as one example. The laser continuously fired while Target made the spiral motion. After the scanning was completed laser burn pattern was recognizable. (see Figure 4). User did not intervene to reposition the laser spot. Also, due to the high scan rate capability of the TriplleTOF 5600, the velocity of the spiral motion could be chosen very high at 40 mm/min (seeFigure 1). A one minute average peptide spectrum is shown on Figure 5.

Figure 4: Pattern After the Spiral Motion

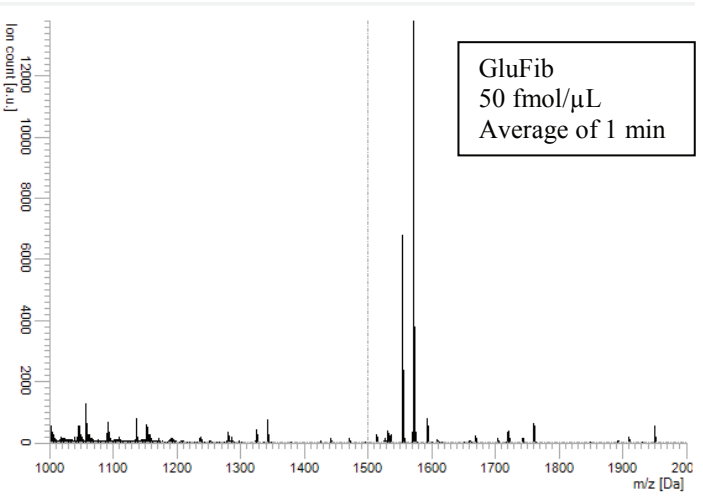

Figure 5: Peptide Mass Spectrum

Automated Analysis

Automation was tested with Target's auto sequence mode, where Analyst Software was enabled with LC sync feature. This enables multiple samples to be acquired without user intervention: multiple spots are selected, Analyst Software is set to acquire equal number of files, and then data are acquired in sequence. (see Figure 6)

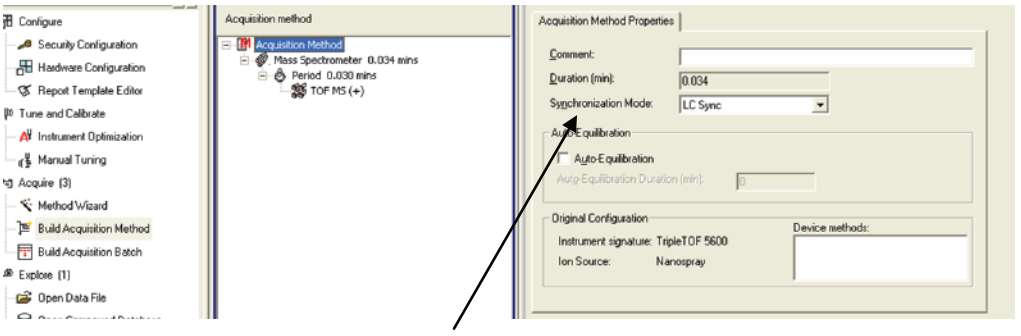

Figure 6: LC Sync option under Analyst software (Version 1.6)

Zoom Mode

A new feature available beginning Target Version 7.0 is the Zoom Mode. It is available by two soft keys added at Target soft key panel as highlighted on Figure 7.

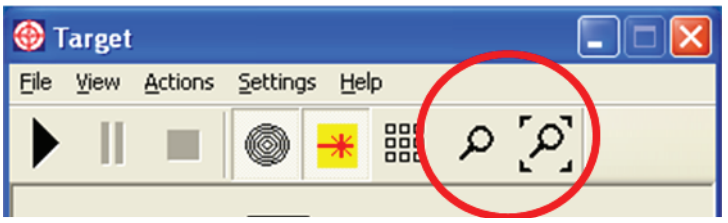

Figure 7: Target Zoom Mode buttons

The sample areas can be scanned under the "zoom mode" of Target. The two scanning modes available are: Full sync of each pixel with the MS (Pixel Map) and the continuous motion with each row synced with the MS (CSR-Constant Speed Raster).

The Target Software can also run in an internal timing mode, where the MS acquisition will start when the sync signal is received from Target.

Imaging tests were done with pattern creation through laser burning. Peptide was spotted on an ABI-opti-TOF plate (1.5 mm size). Patterns were created with Target software by moving the sample 0.2 mm for each turn, however the software would continuously move for 1.5 mm to cover the entire length of the spot. These patterns are created as horizontal and vertical stripes that are approximately 100 µm thick; the laser created pattern can be seen in Figure 8.

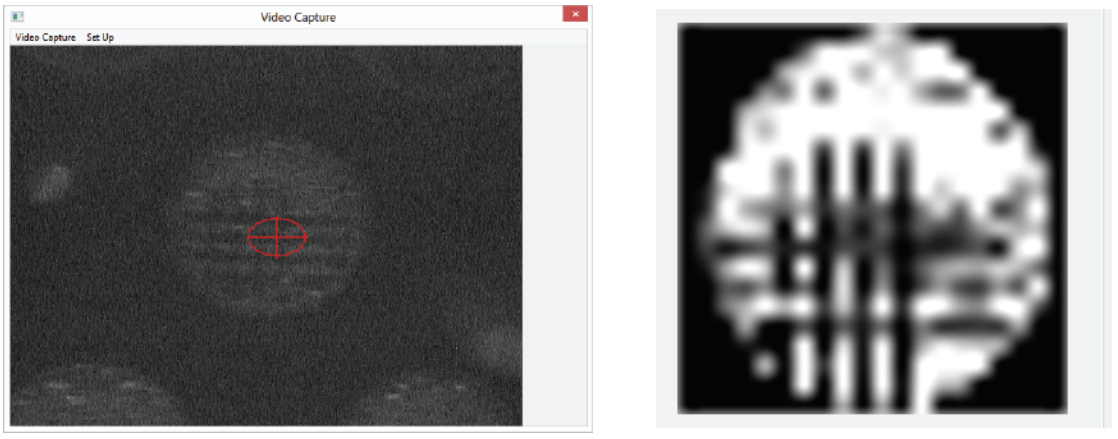

Figure 8: Spot being Imaged on the left and Actual Ion Image on the right (at 1570 m/z).