ProofSTATEMENT

Waters

Q-TOF PREMIER: RESOLUTION

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RESOLVING POWER AND RESOLUTION DEFINED

The ability of a mass spectrometer to separate two ions from each another, with less than a fixed amount of overlap, is defined as the *resolving power* of the instrument. The experimental measurement of resolving power is defined as *resolution*. The two terms are frequently used interchangeably.

THE RESOLUTION OF THE Q-TOF PREMIER CAN BE ENHANCED FROM 10,000 TO 17,500 FWHM WHEN REQUIRED

The resolution specification of the Waters® Micromass® Q-Tof Premier™ Mass Spectrometer is 10,000 full width half maximum (FWHM) when operating in V-Optics™ mode. This performance provides sufficient resolution to distinguish between low molecular weight ions that are closely related in m/z, or to characterize the charge state of peptides in both MS and MS/MS modes of analysis. When required, the resolution of the Q-Tof Premier can be enhanced to 17,500 FWHM. This W-Optics™ mode utilizes an additional ion mirror in the oa-TOF which redirects the ion beam to make a second pass through the reflectron, effectively doubling the flight path of the analyzer. The enhanced resolution provided by W-Optics mode is available across the m/z range. Switching between V- and W-Optics mode is easily configured by selecting the appropriate icon in the MassLynx control software. Figure 1 demonstrates the TOF analyzer in both modes of operation.

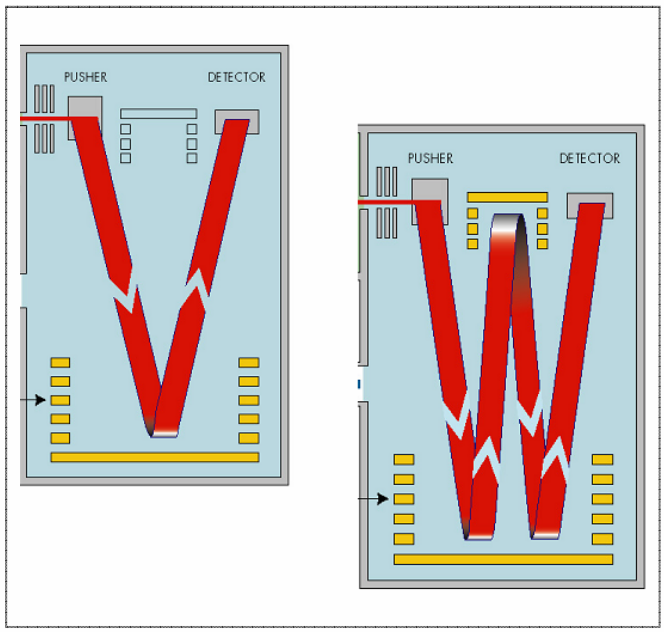
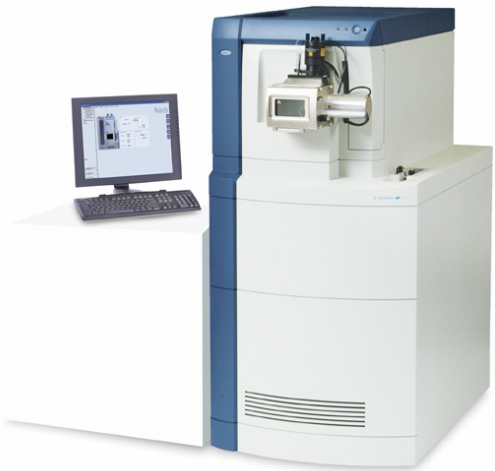


Figure 1. The Q-Tof Premier's TOF analyzer in both V- and W-Optics mode of operation.

An example of the utility of W-Optics mode is shown in Figure 2, which illustrates a resolution of 17,500 for the measurement of the $(M + 6H)^{6+}$ isotope cluster from bovine insulin (m/z 956).



Waters Micromass Q-Tof Premier Mass Spectrometer

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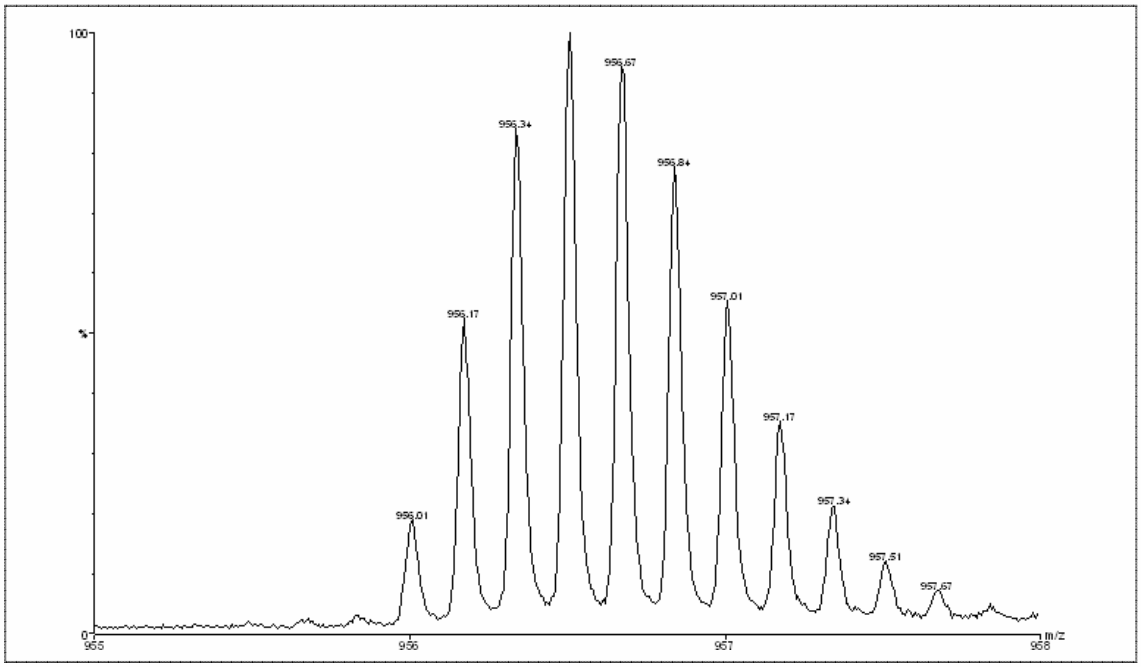

Figure 2. ESI spectrum showing a resolution of 17,500 as measured on the $(M + 6H)^{6+}$ isotope cluster from bovine insulin (m/z=956).

CONCLUSION

From this data, we can ascertain the utility of the Q-Tof Premier's W-Optics for providing enhanced resolution when required. This performance is ideal for complex sample analysis, such as urine, plasma or natural product extract where the likelihood of components having similar masses is higher.

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