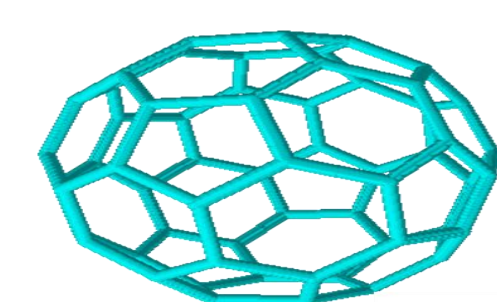


# Benefits of High Resolution Mass Spectrometry for Environmental Analysis

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## Fullerenes



Fullerenes are carbon-based nanomaterials that have been gaining attention as emerging contaminants. They are used in several electronic, biomedical, photovoltaic applications as well as in personal care products.

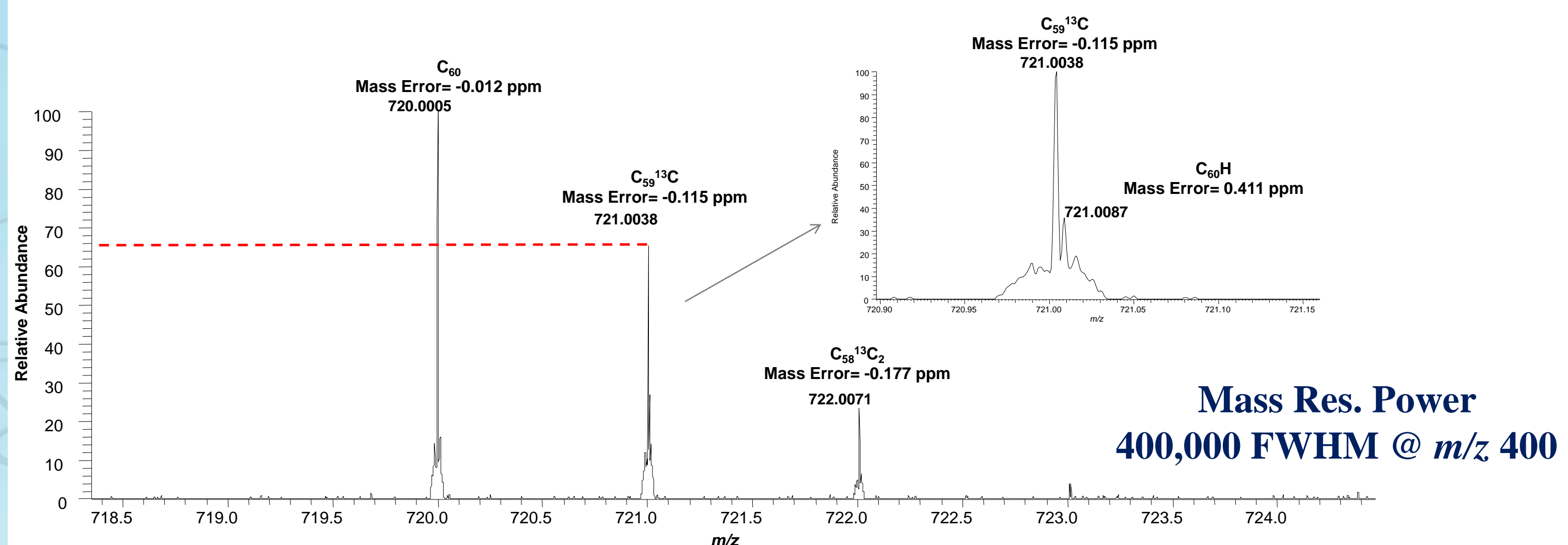
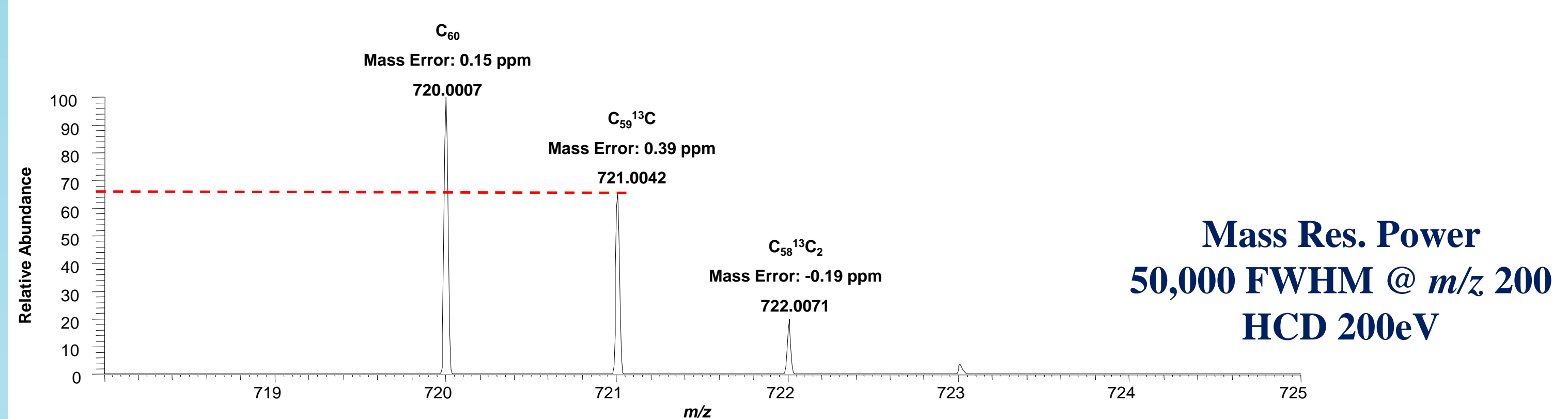
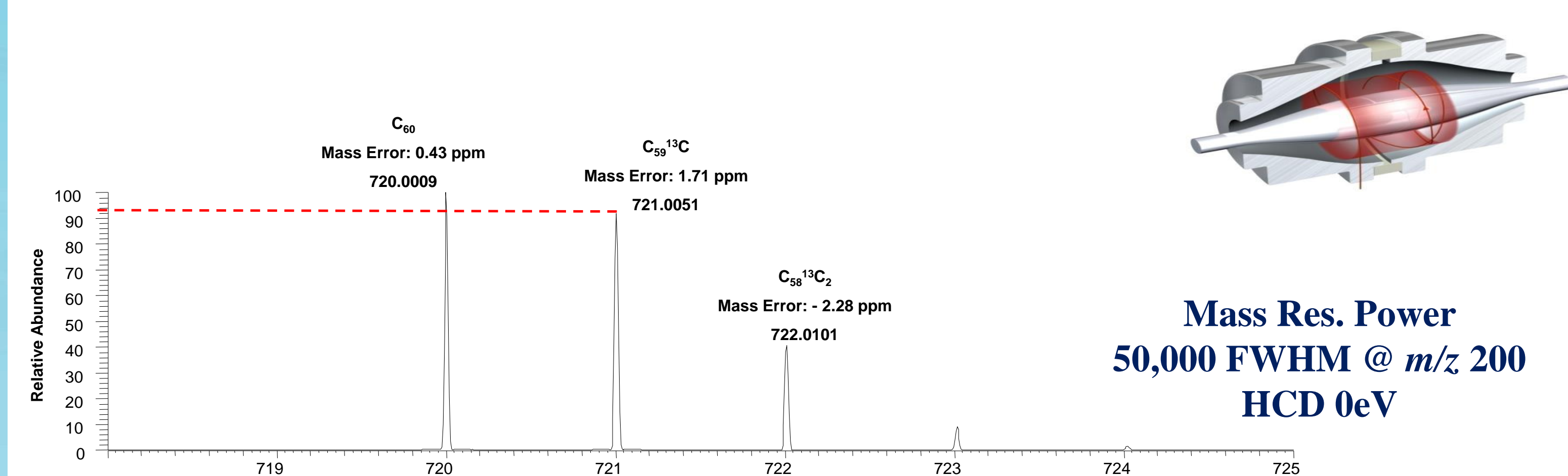
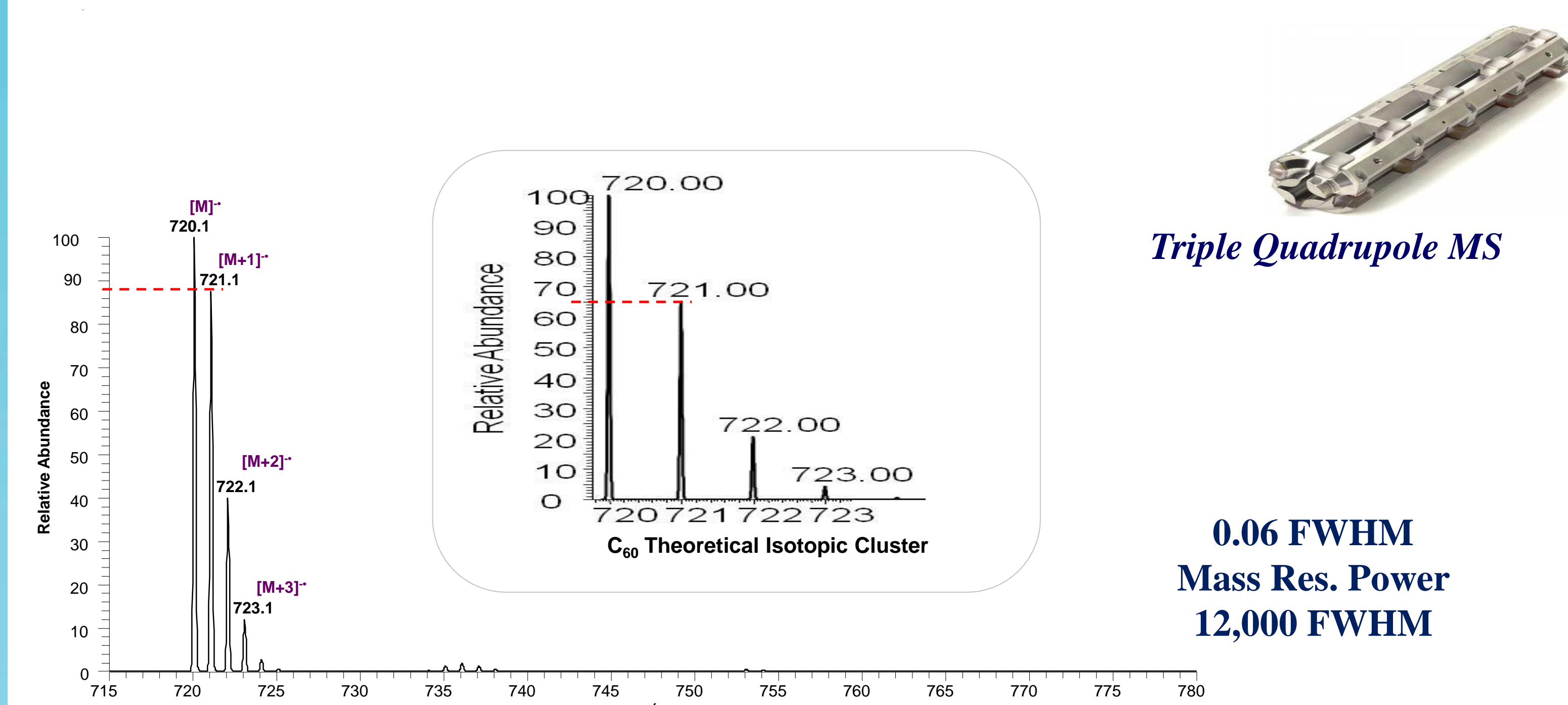
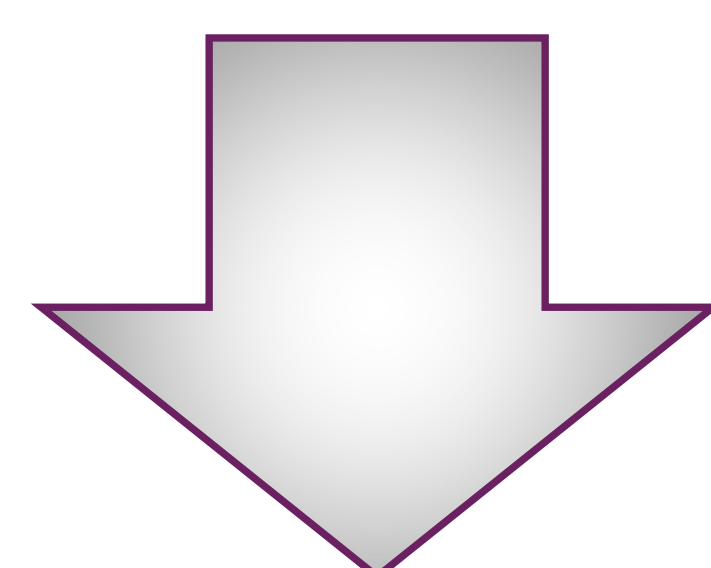


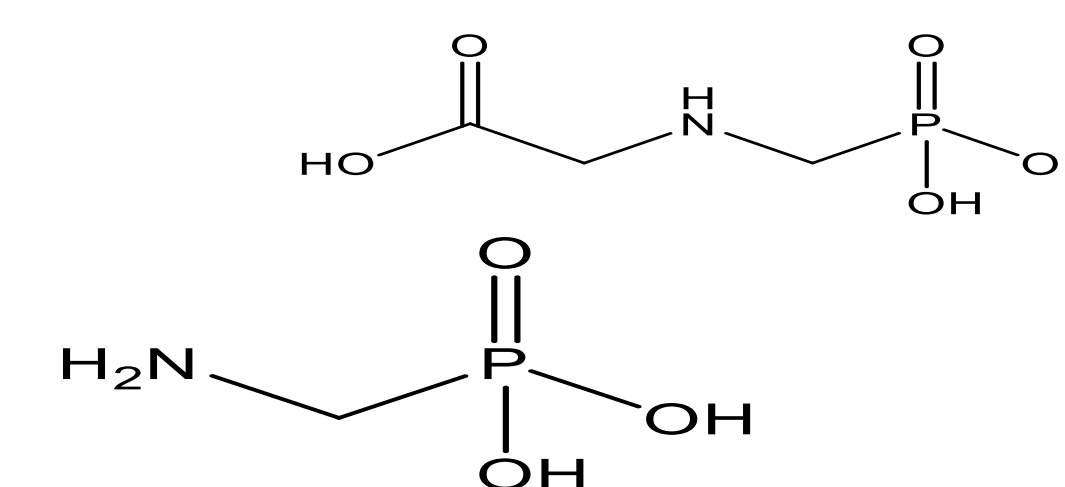
FIGURE 1. LC-APPI-MS spectra of C<sub>60</sub> fullerene in low, high and ultra-high resolution. Comparison with theoretical isotopic cluster of C<sub>60</sub> [1]



High Mass Resolving Power enables the correct match of the isotopic cluster of C<sub>60</sub>

Good confirmatory strategy for fullerenes analysis

## Glyphosate and AMPA



Due to its worldwide use as herbicide and restrictive regulation of the EU, sensitive and selective analytical methods for the analysis of glyphosate and its metabolite AMPA are required.

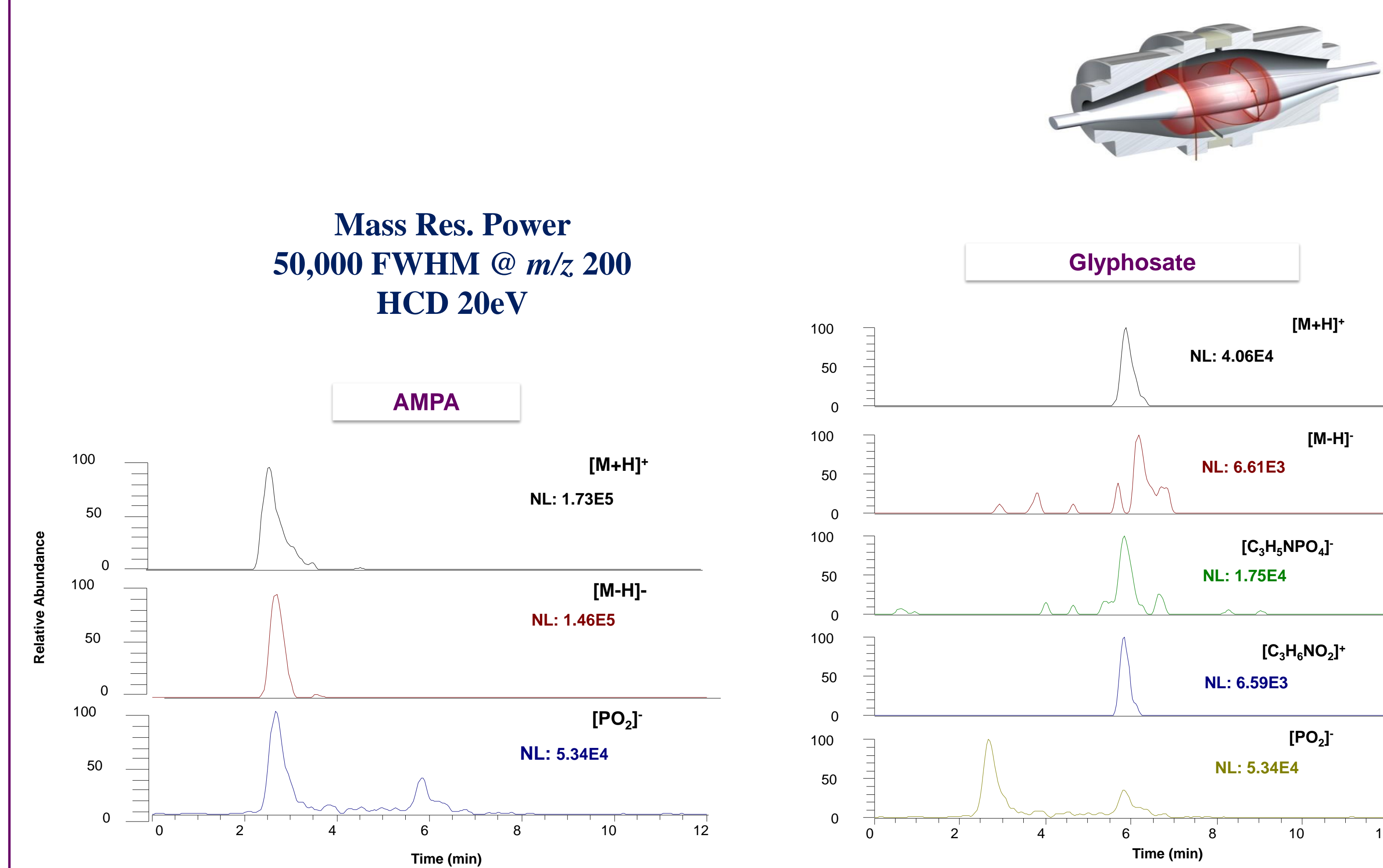
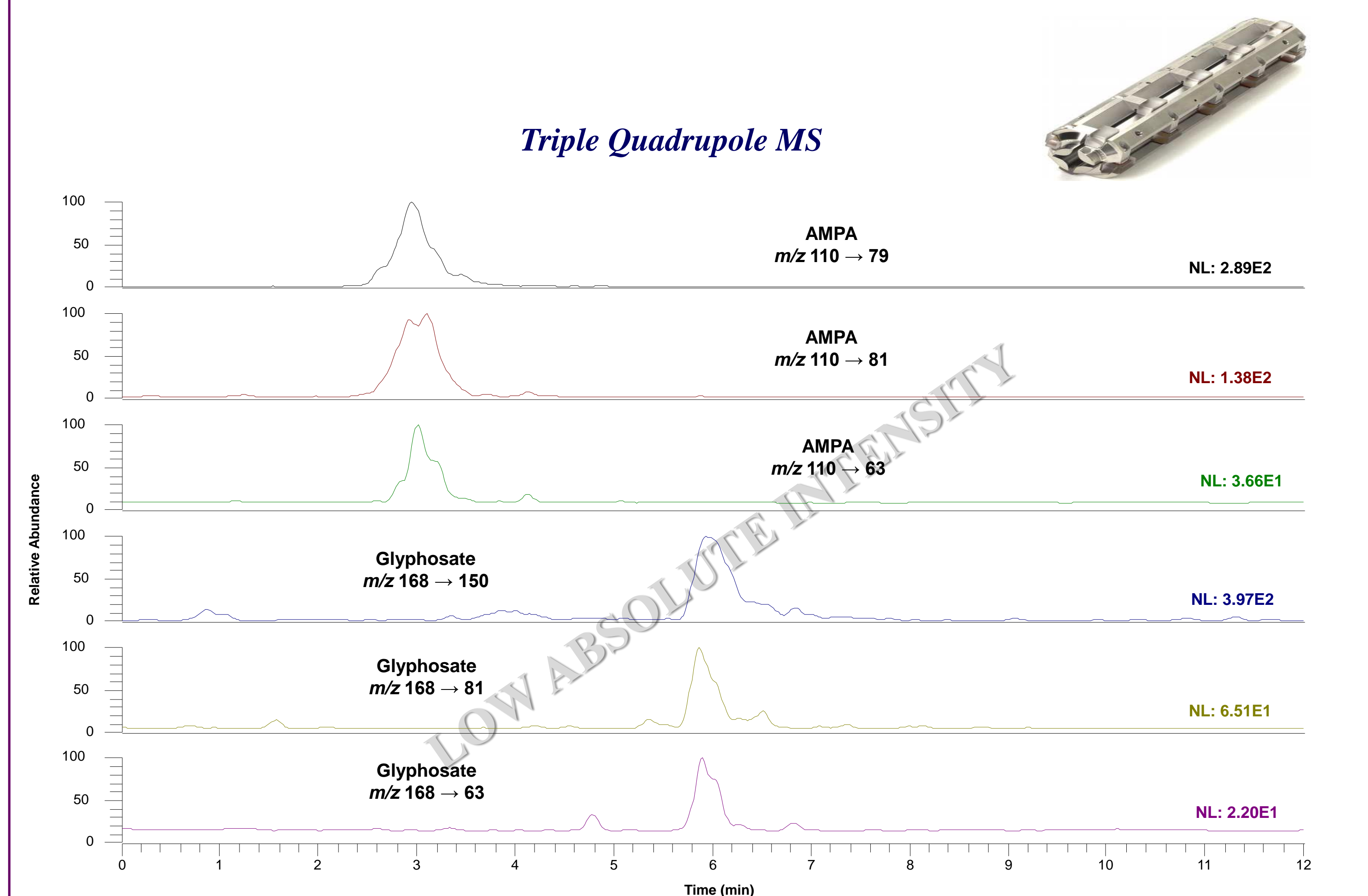
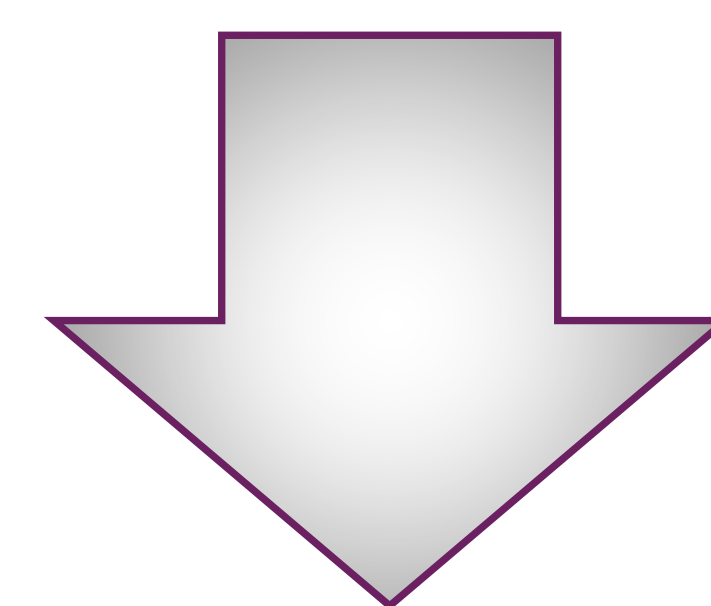


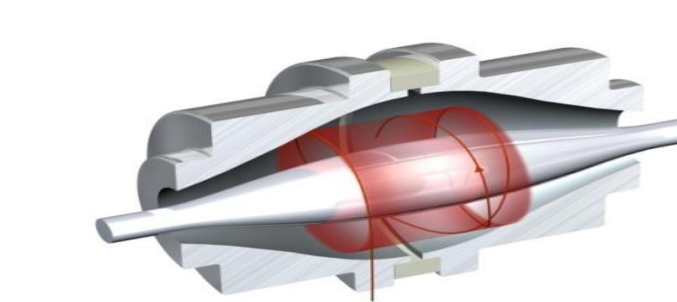
FIGURE 2. Comparison of Qq and HRMS for the analysis of a surface water sample spiked at 12.5 µg/L [2]



High Resolution Mass Spectrometry helps achieving better sensitivity and selectivity

This is essential for the determination of glyphosate and AMPA in water samples

## Screening



Environmental contamination is not always predictable. It is often necessary to do general contaminants surveillance, or non-targeted screening. The combination of high resolution and accurate MS and MS/MS is an essential tool for the identification of targeted and non-targeted compounds.

For a reliable formula assignment, mass resolving power is critical. An excellent mass accuracy is crucial when limiting the number of candidates assigned to the experimental mass measured.

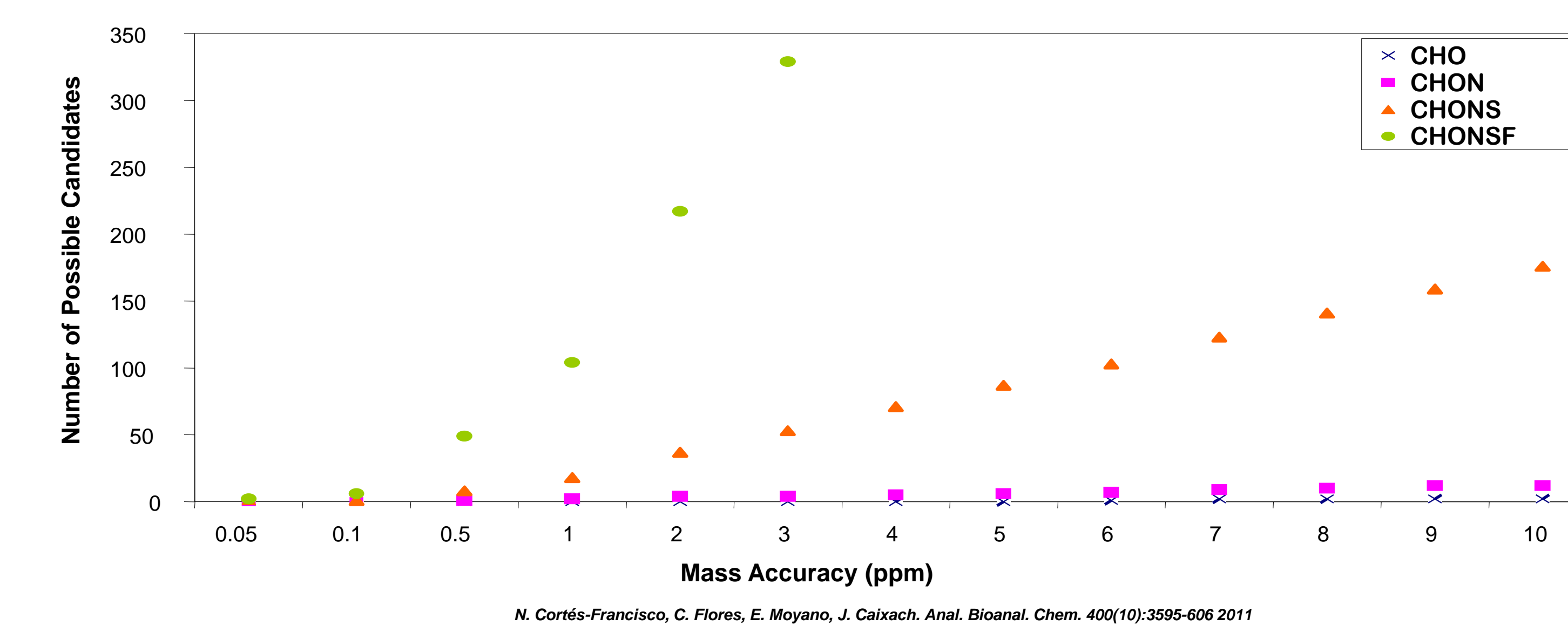


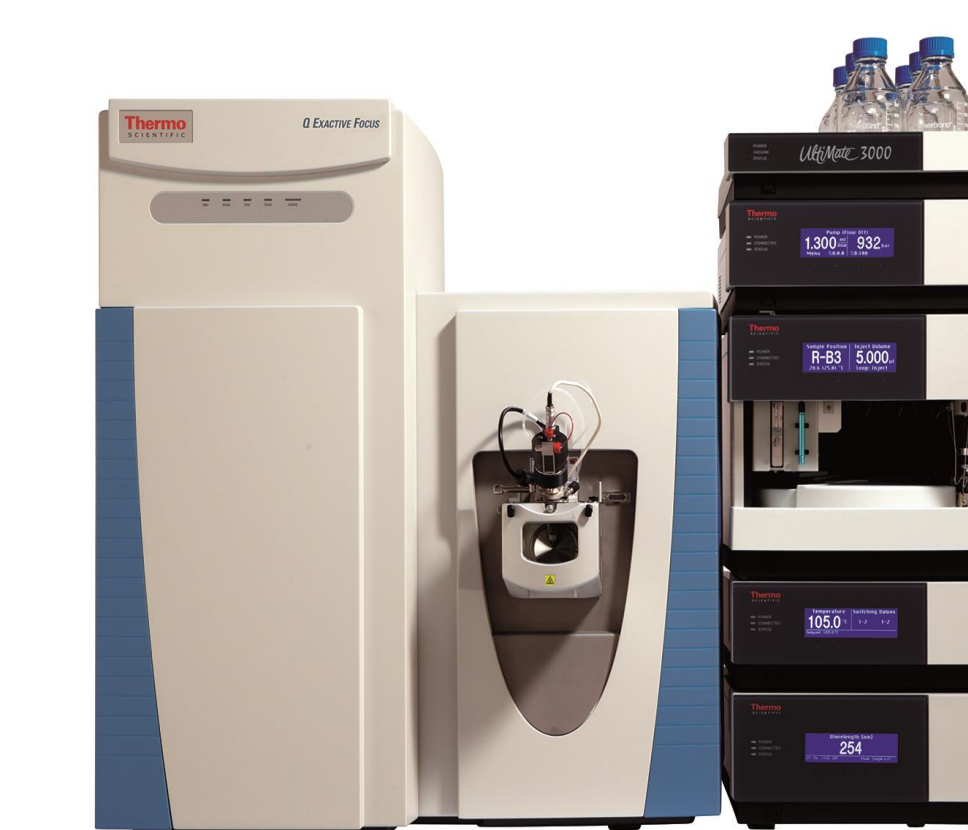
FIGURE 3. For a mass measurement (m/z 498.9302) the number of possible candidates was estimated, taking into account the elemental composition as well as the mass accuracy of the experiment [3]



Thermo Scientific™ TSQ Endura MS



Thermo Scientific™ TSQ Quantiva MS



Thermo Scientific™ Q Exactive Focus MS

## References

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