



**GC-MS**  
is about to change.  
**Forever.**

## Welcome to Orbitrap Technology for Gas Chromatography

We are excited to present our first update on the extension of Thermo Scientific™ Orbitrap™ technology to gas chromatography. We believe this technology will open unique possibilities for your applications and change GC-MS, forever.

We welcome your feedback, opinions, and ideas about these communications. We would also like to know what GC Orbitrap technology could mean for your laboratory.

In this update, we share some data on the analysis of low-level contaminants in complex matrices.

### Low-level Contaminants in Complex Matrices

Many food safety labs are using triple quadrupole GC-MS/MS to take advantage of its higher selectivity for pesticide screening analysis. However, because MS/MS is a targeted analysis, it may miss contaminants that are not being scanned for. As a result, the food safety community is increasingly interested in a GC/MS system that can:

- perform pesticide analysis in an untargeted mode
- maintain comparable sensitivity to that of a triple quadrupole
- maintain comparable selectivity to that of MS/MS

In short, these labs need an instrument with the sensitivity and selectivity of a triple quadrupole that can operate in an untargeted mode.

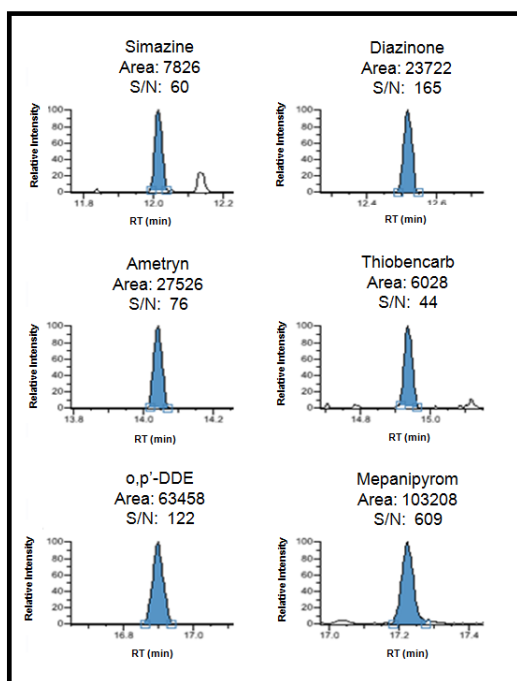
High resolution Orbitrap-based GC/MS, operated in full scan mode, is an ideal solution. It provides high resolution to surpass the crossover point where the selectivity of high resolution meets or exceeds that of MS/MS.

### Orbitrap-based GC/MS Compared with Triple Quad

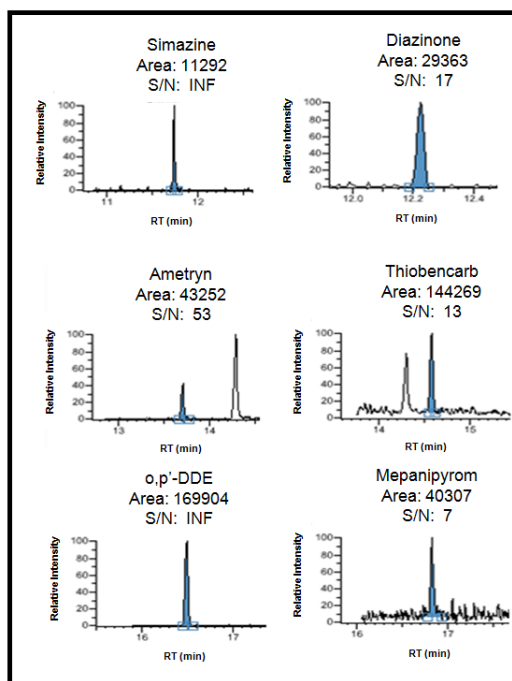
We used six pesticides in a QuEChERS-extracted tea matrix to compare the selectivity of an Orbitrap-based GC/MS with an EI source operating in full scan mode to a GC-triple quadrupole instrument with an EI source operating in SRM mode.

The results, shown in the mass traces below, are encouraging:

## GC-Orbitrap in Full Scan Mode



## GC Triple Quadrupole in SRM Mode



Mass traces of the quantitation ion at 10 ppb (in vial) for six pesticides in a tea matrix.

Tea is one of the most challenging food and beverage matrices for GC/MS analysis, so the absence of interference indicates good selectivity at 60,000 resolution. The symmetrical peak shapes, high intensities, and good signal-to-noise values indicate strong sensitivity at concentrations typical for pesticide analysis. Together, these results indicate that the GC-Orbitrap instrument detects pesticides at a level comparable to that of a triple quadrupole instrument, while operating in an untargeted full scan mode, allowing for the identification of unknown contaminants.

In future updates, we will provide more details on the quantitative capabilities of this prototype instrument and data demonstrating the power of GC-Orbitrap technology for identification of unknowns.

We'd love to hear your thoughts. Please contact us at [hramqcms@thermofisher.com](mailto:hramqcms@thermofisher.com).

Best regards,

Thermo Scientific GC-Orbitrap Team