

Excellence and Robustness: Meet the Market Leader

Agilent triple quadrupole GC/MS systems

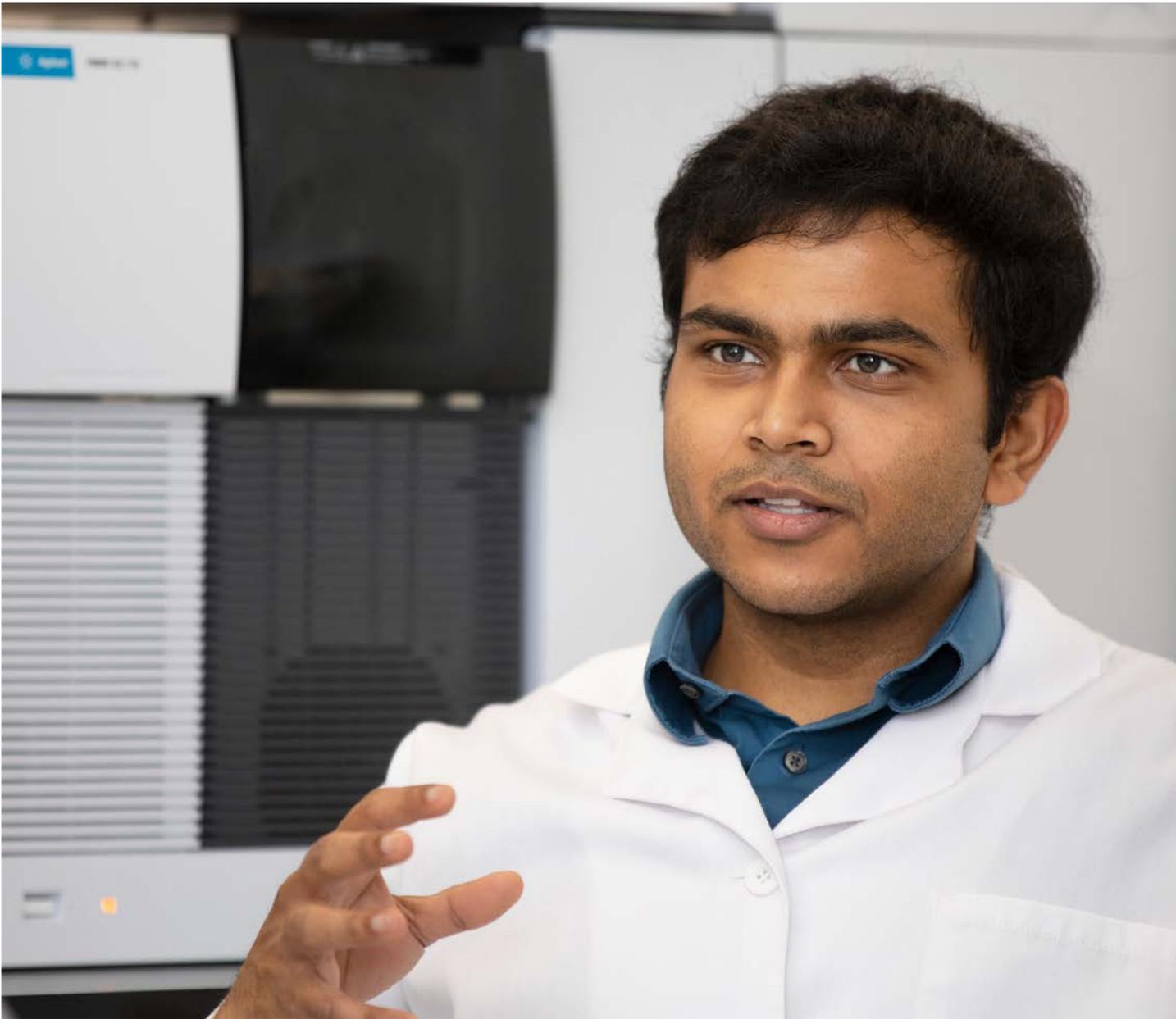


A Robust Solution That Maximizes Your Return on Investment

The advanced portfolio of Agilent triple quadrupole GC/MS instruments provides everything you need to take your lab to a higher plane of productivity and confidence—including low detection limits, robustness, and software tools to simplify method optimization and lower your operating costs.

The Agilent 7000D and 7010B triple quadrupole GC/MS instruments pair seamlessly with the Agilent 8890 GC system as well as the Agilent Intuvo 9000 GC system to deliver proven reliability, high sample throughput, and instrument intelligence.





A Portfolio Designed for Accuracy and Reliability



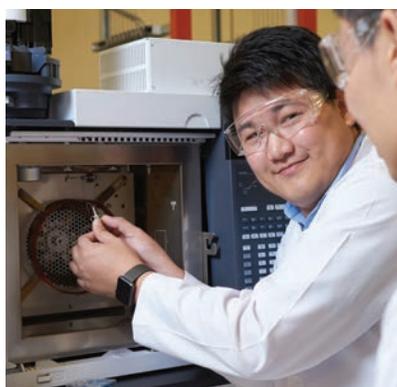
The Agilent 7000D triple quadrupole GC/MS

The latest model of the most successful GC/MS/MS in history. It is the fourth-generation version of the GC/TQ used by agencies around the world to create and validate many now standard GC/MS/MS methods. With Agilent MassHunter software, you have complete control from tune to report generation while streamlining your workflow.



The Agilent 7010B triple quadrupole GC/MS

The most sensitive version of Agilent compact benchtop triple quad systems, which provides attogram-level detection limits in electron ionization (EI) mode. It is equipped with a High Efficiency EI Source (HES) that produces at least 20 times on average as many ions as the previous generation, making it the most sensitive Agilent GC/TQ.



The Agilent Inert Flow Path

This solution ensures the inertness of every surface that touches your sample during the GC/MS analysis, so you can:

- Achieve parts-per-billion—or parts-per-trillion—detection levels that today's analyses demand.
- Process more samples before needing maintenance.
- Ensure accurate and reproducible results.

Learn more: www.agilent.com/product/gas-chromatography

Next generation GC intelligence

The built-in intelligence enables you to monitor your GC system, check system logs, and perform diagnostic tests from anywhere. An autonomous, user-initiated tool checks the health of the GC, alerting you about potential issues and suggesting how to solve them.

Intelligent troubleshooting routines diagnose problems by measuring over 100 system touchpoints in real time and providing a step-by-step solution guide in an easy-to-read format.



The Agilent 8890 GC system

Cost-saving, advanced electronic pneumatic controllers such as the helium conservation module, hydrogen sensors, and alternate carrier gas solutions, reduce the amount of helium used, offering both flexibility and higher levels of safety.



The Agilent Intuvo 9000 GC system

Designed for fast gas chromatography and high throughput while simplifying workflow. Fast, direct heating and rapid cooling reduce analysis and cycle times.



Backflush

Supported by capillary flow technologies, backflushing reverses the flow in the column so that any remaining components are forced out through the sample inlet. Backflushing offers many benefits, such as:

- Shorter analysis times
- Longer column life
- Less carryover
- Extended maintenance-free operation

Learn more: www.agilent.com/products/gas-chromatography

Technology behind the performance

The Agilent triple quadrupole GC/MS is more than the sum of its parts. From ion sources to vacuum pumps and everything in between, we provide unparalleled robustness for most solutions.



Flexible EI sources to meet the needs of your workflow

Between the InertPlus EI source and the HES, the most challenging matrices have met their match. The InertPlus EI source is available with 3 mm, 6 mm, and 9 mm extractor lenses and boasts a wide dynamic range. The HES provides increased sensitivity and is designed for ultra-trace level analysis.



Maximize instrument uptime and throughput with the Agilent JetClean self-cleaning ion source

Reduce manual cleaning frequency by 80% or more, depending on your application. JetClean increases productivity by minimizing or eliminating time spent venting, cooling down, disassembling, cleaning, reassembling, retuning, and recalibrating the instrument so you can extend periods of maintenance-free operation. It is compatible with Inert Plus and HES ion sources (EI only or EI/CI).



High-temperature, gold-plated monolithic quartz quadrupole

The quartz monolith guarantees perfect alignment for hyperbolic surfaces throughout the life of the mass spectrometer. Gold surfaces stay clean and are maintenance-free in high temperatures—up to 200 °C.



The IDP-10 dry scroll pump minimizes downtime and creates a clean vacuum path

The Agilent IDP-10 dry scroll pump is an oil-free, compact, quiet, isolated vacuum pump with remote speed control. It uses an inverter-driven motor, providing uniform vacuum performance at all global frequencies and input voltages. IDP pumps use a single-sided scroll design that offers a 15-minute maintenance procedure with simple tools.



Keep your ion source clean, automatically

The patented Agilent JetClean self-cleaning ion source greatly reduces—or even eliminates—the need for source cleaning on Agilent single- and triple-quadrupole GC/MS systems. So, you can save time and protect the integrity of your results.

Learn more: www.agilent.com/chem/jetclean-self-cleaning-ion-source

MassHunter Software

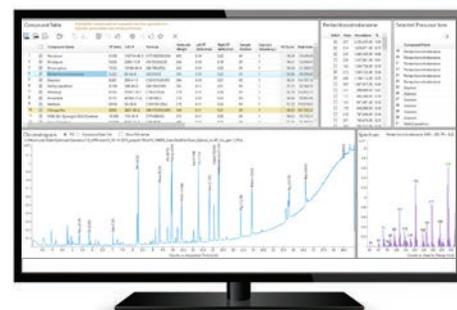
Elevating productivity



MassHunter Optimizer for GC/TQ software

Using MassHunter Optimizer for GC/TQ dramatically decreases the amount of time, effort, and expertise required to develop multiple reaction monitoring (MRM) data acquisition methods. The Optimizer for GC/TQ uses spectral deconvolution to reliably identify precursor ions, even in the presence of chromatographic interferences. This tool enables significant time savings and reduces manual review when developing MRM data acquisition methods. Key advantages of the MassHunter Optimizer include:

- Time savings for developing an optimized MRM method
- A smooth transition of GC/MSD methods to GC/TQ
- Reproducibility
- Automation and reduced manual work
- Built-in review tools



Agilent Pesticides and Environmental Pollutants GC/MS/MS Analyzer 4.0

The Agilent Pesticides and Environmental Pollutants Analyzer 4.0 for GC/TQ with the Agilent MassHunter pesticide and pollutant MRM database provides the MRM transitions that enable easy method development. This, in turn, allows for the analysis with enhanced selectivity and low detection limits. Dynamic MRM (dMRM) enables larger target lists in a single run due to more efficient use of instrument data acquisition time. dMRM also provides an intuitive way to build and modify acquisition methods using the P&EP MRM database. The database is also available in a standalone version to provide greater flexibility and versatility to existing GC/TQ systems.

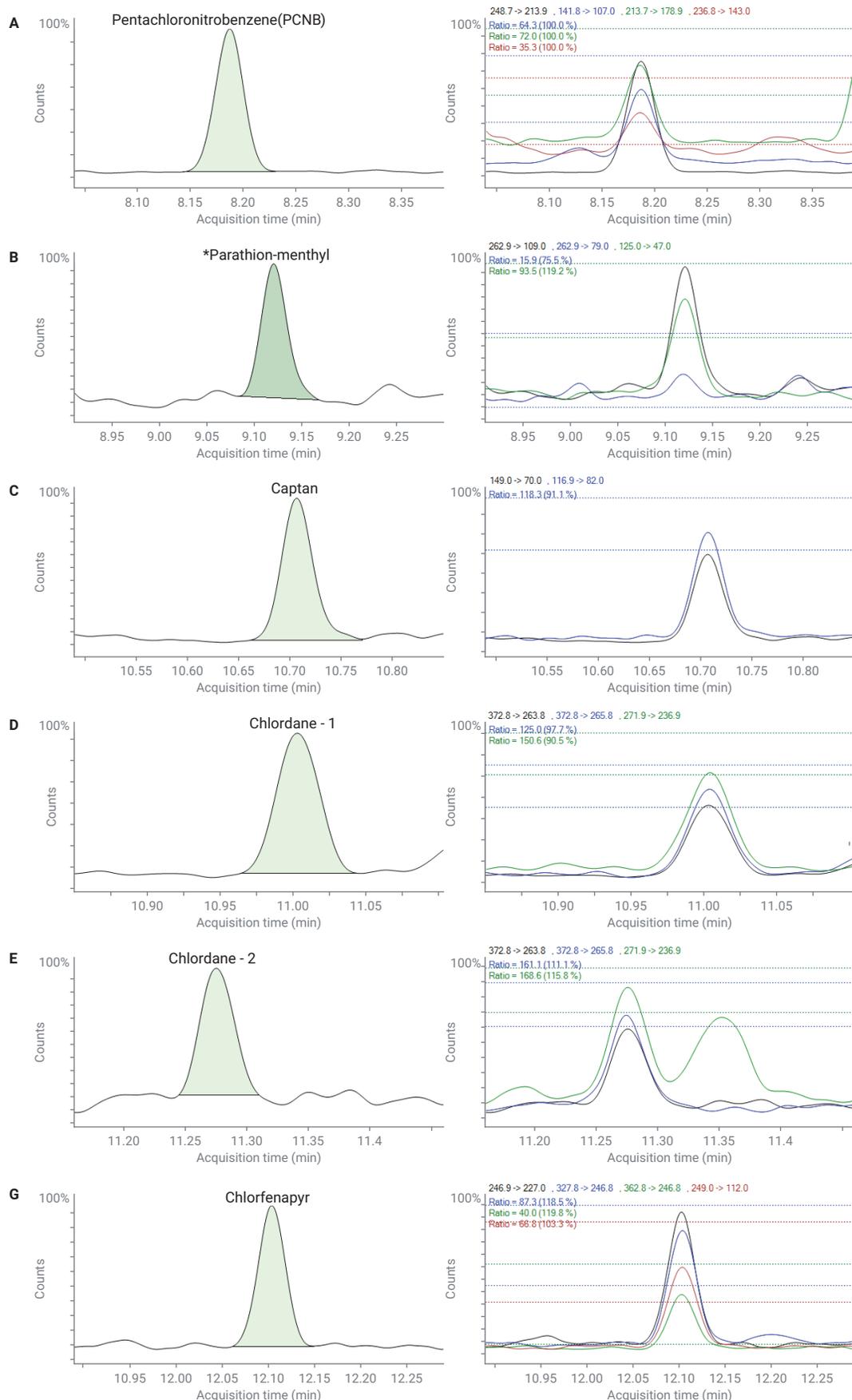


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Learn more: www.agilent.com/chem/emethods

Extracted ions for quantifiers and qualifiers for challenging pesticides regulated in cannabis



A) PCNB at 0.0625 ppb;
 B) methyl parathion at 0.016 ppb; C) captan at 1.00 ppb; D) chlordane-1 at 0.25 ppb; E) chlordane-2 at 0.25 ppb; G) chlorfenapyr at 0.25 ppb

Pesticide Residues in Complex Food Matrices



A robust analysis to ensure food safety from farm to table with Agilent 7000D GC/TQ

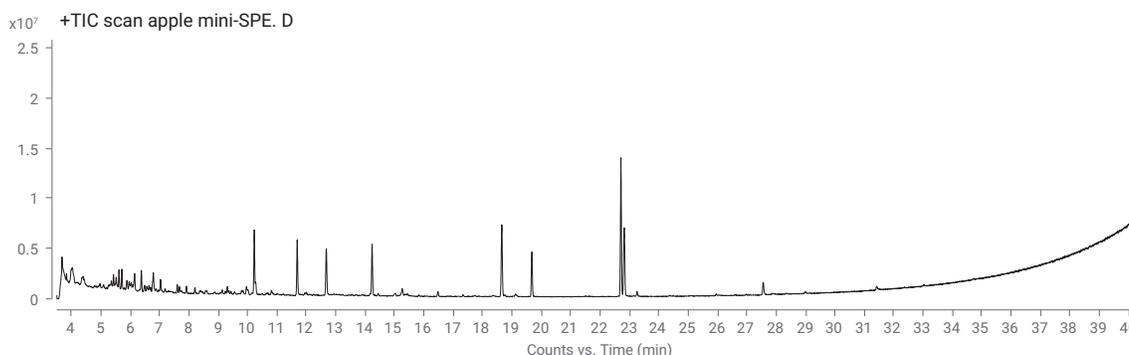
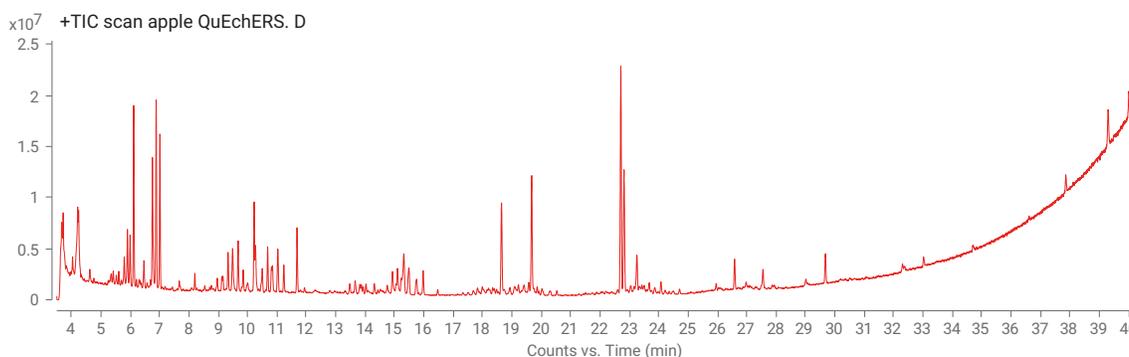
The Agilent 7000D triple quadrupole GC/MS system is a robust and versatile instrument that is able to meet the needs of numerous applications—among them, food safety.

In application note [5994-0462EN](#), apples, oranges, and lettuce were used for food test matrices. Sample cleanup was performed using either an Agilent mini-SPE cartridge for extract cleanup or an Agilent QuEChERS dSPE.

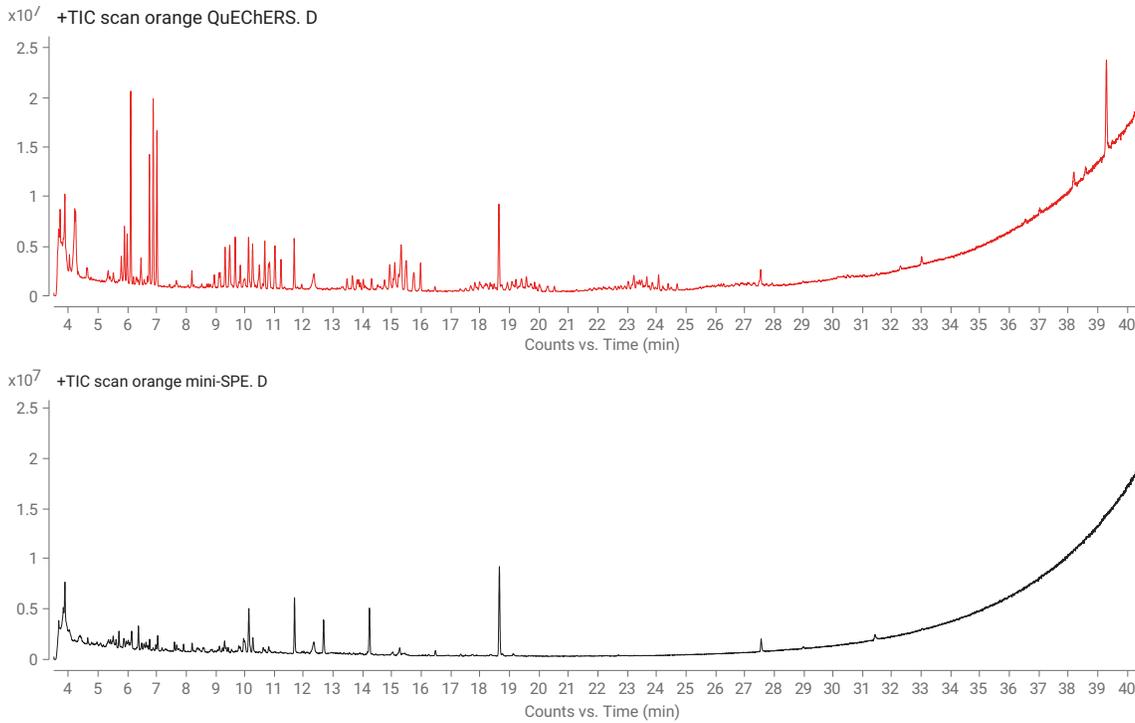
When performing pesticide analysis, the Agilent 7000D GC/TQ is able to accomplish great reproducibility. For all three matrices, RSDs are lower than 10% for standard levels of 5, 10, and 50 ng/mL.

For an automated hands-off sample prep experience, the Agilent PAL RTC sample handling system offers your pesticides analysis workflow a powerful and versatile solution.

Full-scan chromatogram (TIC) of apple QuEChERS extract (red) and mini-SPE cleaned extract (black)



Full-scan chromatogram (TIC) of orange QuEChERS extract (red) and mini-SPE cleaned extract (black)



Full-scan chromatogram (TIC) of lettuce QuEChERS extract (red) and mini-SPE cleaned extract (black)

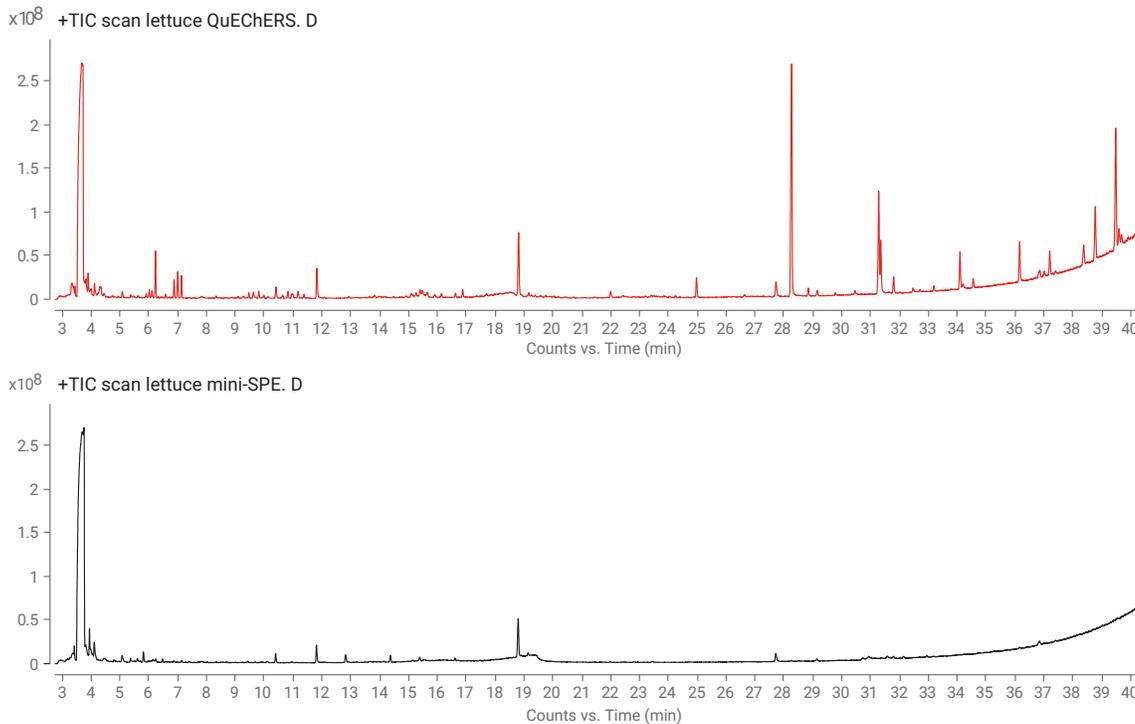


Fig 8. Full-scan chromatogram (TIC) of lettuce QuEChERS extract (red) and mini-SPE cleaned extract (black)

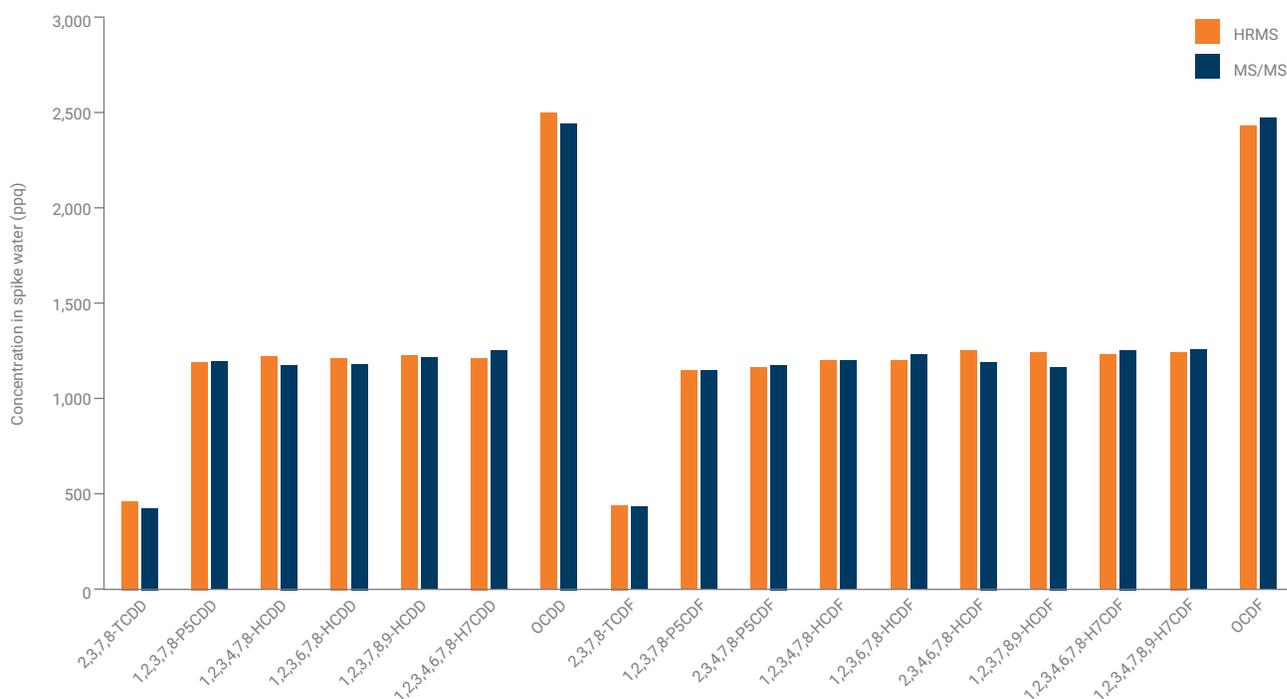
Dioxins in Food and Environmental Samples (U.S. EPA Method 1613)



Ultimate cost savings using Agilent 7010B GC/TQ in environmental pollutant analysis

Because of the sensitivity requirements set by EPA 1613, the Agilent 7010B GC/TQ is the perfect solution when testing dioxins and other persistent organic pollutants. Not only does it meet the specification requirements, the 7010B GC/TQ neither requires the same expensive maintenance nor the highly specialized skill set for operation as is needed for magnetic sector GC/HRMS.

In application notes [5994-0677EN](#) and [5994-1412EN](#), the 7010B GC/TQ provides reproducible and sensitive detection of 17 toxic PCDD/F congeners. The results from the GC/TQ were close to the certified reference values and comparison of analytical results by the magnetic sector GC/HRMS and the GC/TQ indicated the suitability of the 7010B GC/TQ for this method.



Comparable results were achieved when comparing the concentration determined by GC/HRMS and GC/MS/MS analysis of a spiked water sample.

Fast Analysis of Semivolatiles (U.S. EPA Methods 625.1 and 8270D/E)



Agilent GC/TQ provides remarkable performance and reliability with semivolatile analysis

EPA method 8270D/E provides an extensive list of compounds that may be analyzed using GC/TQ. These compounds can originate from many types of solid waste matrices, soils, air sampling media, and water samples.

When coupled with the Agilent 8890 GC system, the 7000D GC/TQ is able to surpass the performance requirements of the method for 77 target compounds with a working range of 0.02 to 160 ppm in a single 10-minute run. Due to the impressive selectivity of MRM analysis, method performance, including linearity and reproducibility, is greatly enhanced.

This fast method for EPA 8270D/E is further detailed in application note [5994-0691 EN](#).



Collaborators from Weck Laboratories demonstrated increased sample throughput and were able to decrease costs associated with EPA Method 625.1 by converting to automated supported liquid extraction (SLE) and to the more selective and sensitive technique of GC/MS/MS in MRM mode.

Learn more: www.chromatographyonline.com

Nitrosamine Impurities in Drug Products and Drug Substances



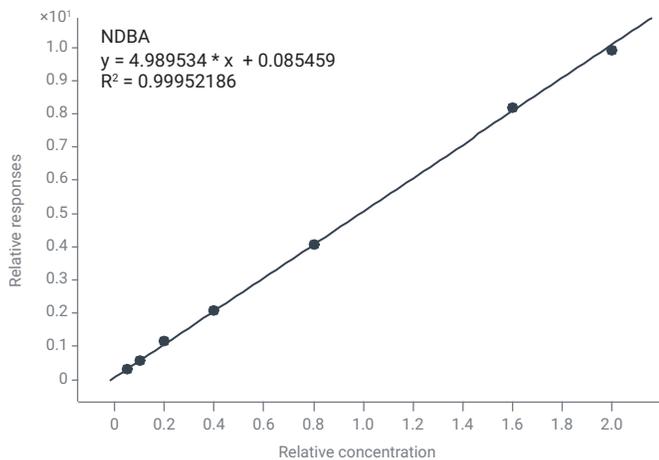
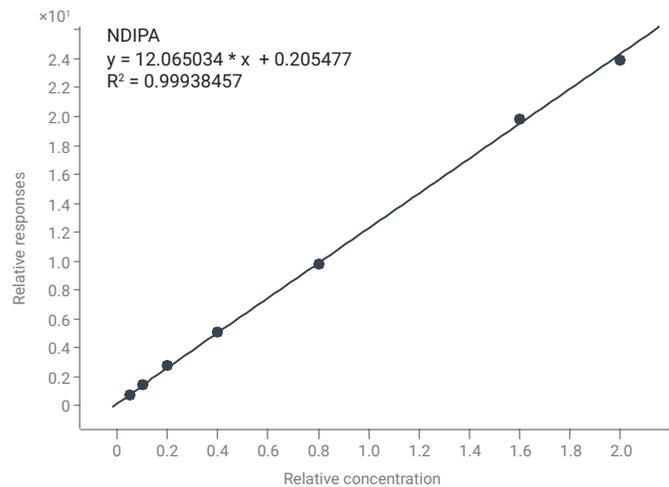
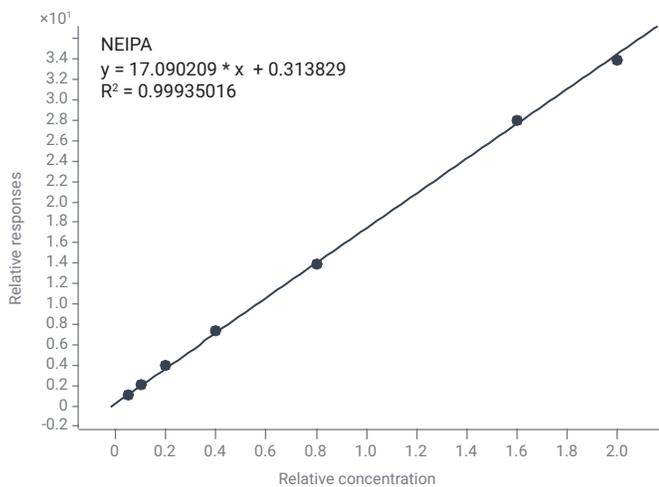
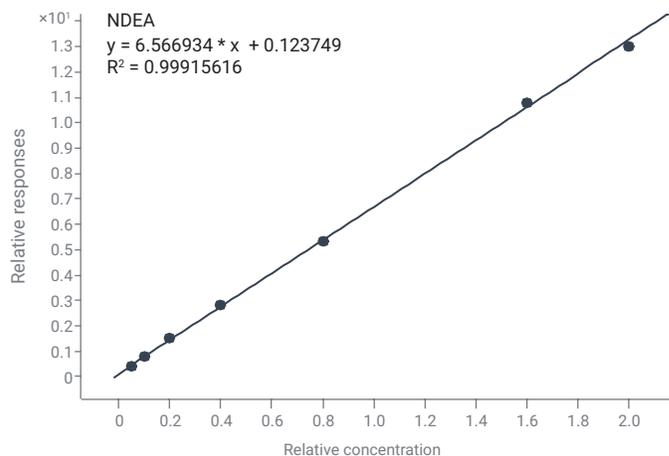
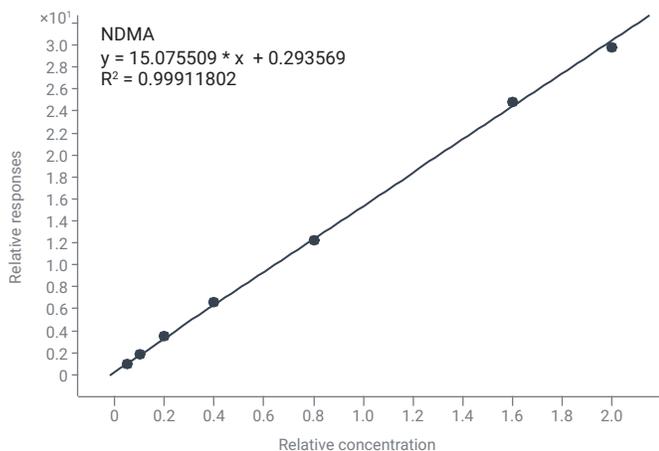
Trace-level analysis with the HES

Due to the presence of various animal and suspected human carcinogens, many drugs, including valsartan, irbesartan, and losartan, have started to be recalled.

The FDA Office of Testing and Research has released several methods for the analysis of these impurities. The latest method calls for triple quadrupole GC/MS to be used for the quantification of five nitrosamine impurities. This method and the nitrosamine study are detailed in application note [5994-1821EN](#).

The 8890 GC offers diagnostic tests and system monitoring alerts as well as touchscreen control and mobile access. The design of the 7010B triple quadrupole GC/MS, which includes the HES, enables lower detection limits for trace-level impurities when combined with the inert sample path provided by the 7890B and 8890 GCs. These features enabled reliable quantification of all five residues. High-sensitivity analysis with improved LOQs that are 2- to 20-fold lower than recommended levels can be performed without changing method parameters.

Calibration curves of five nitrosamine impurities using the Agilent 7890B GC.



The ultimate in GC/MS/MS robustness, performance, and sensitivity for targeted analysis

Our catalog of new applications is ever growing.

To learn more about the Agilent triple quadrupole GC/MS portfolio,
visit us online at www.agilent.com/chem/gc-ms-ms

Learn more:

www.agilent.com/chem/7000d-triple-quadrupole-gc-ms

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