

Food safety

Increased laboratory efficiency with the TSQ 9610 GC-MS/MS in a food and environmental analytical laboratory

“Due to the reduced downtime of the TSQ 9610, more samples can be evaluated, which generates a higher sample throughput per employee resulting in a higher analytical efficiency”

— Rene Urbansky, Eurofins SOFIA GmbH



Thermo Scientific™ TSQ™ 9610 GC-MS/MS system

Laboratories that analyze complex food and environmental matrices face difficult challenges when analyzing pesticides and persistent organic pollutants (POPs) at trace levels. Eurofins SOFIA GmbH in Germany is an analytical testing laboratory that analyzes both environmental and food samples. Rene Urbansky, research assistant and state-certified chemical technical assistant, explains, “We perform residue analysis, including pesticides and organic contaminants, as well as environmental analysis. The matrices we analyze include soil, water, material samples for environmental testing; and oils, cereals, tea, herbs and spices for food safety.” The methods applied in the laboratory are accredited according to DIN EN ISO/IEC 17025: 2018 and serve to ensure the quality of products, intermediates and raw materials along the entire supply chain.

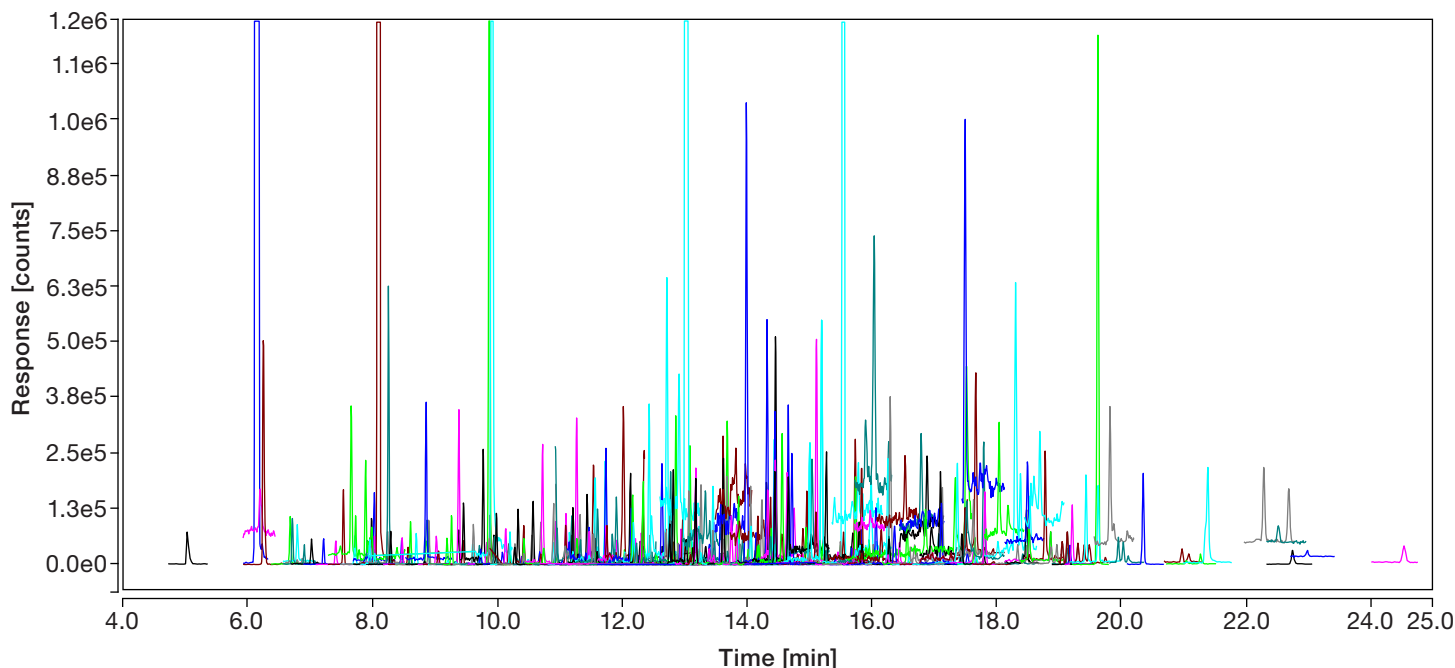


Figure 1. *t*-SRM acquisition for pesticides at 5 µg/kg in sunflower

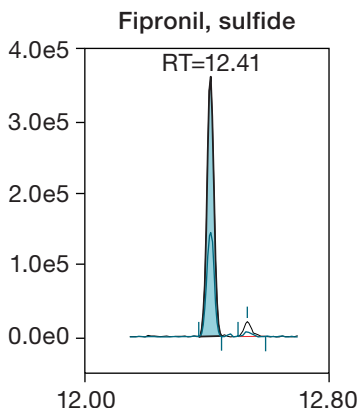
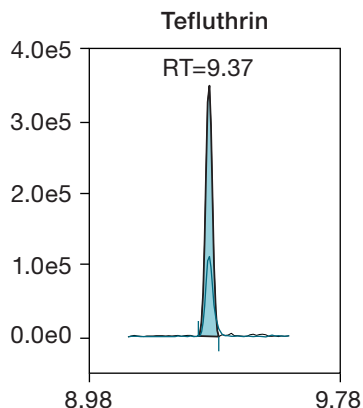
A major challenge for the laboratory is to deal with the diverse sample matrices for the analysis, Mr. Urbansky explains. Mr. Urbansky went into further detail, “To remove the matrix interferences in our samples we are often required to perform a high degree of sample preparation. It is essential that our sample preparation is cost efficient and fast.” According to Mr. Urbansky, another major challenge for the laboratory is price per sample. “Due to the highly competitive market environment, we need to make sure that we deliver high-quality results to our customers while simultaneously keeping an eye on the cost per sample.”

Eurofins SOFIA GmbH added the Thermo Scientific™ TSQ™ 9610 GC-MS/MS system to their equipment and implemented it into their current workflow to reduce sample turn-around. Mr. Urbansky adds, “We wanted to assess the new system and evaluate the sensitivity, reduction of instrument downtime and the ease of use of the new system.” In order to test the instrument, the laboratory analyzed over 200 pesticides in oils, tea and food samples with a high fat content. The laboratory wanted to trial the Thermo Scientific™ NeverVent™ AEI on the TSQ 9610 and see what improvements it offered for productivity.

“Faster evaluation of data with Chromeleon on the TSQ 9610 generates a higher sample throughput with a time saving of 10% to 20% per sample run.”

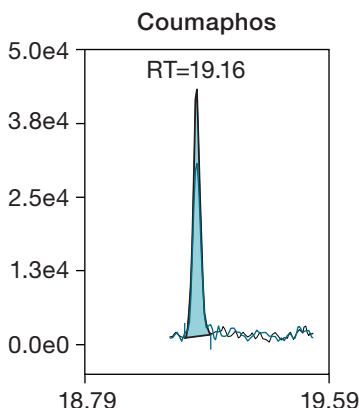
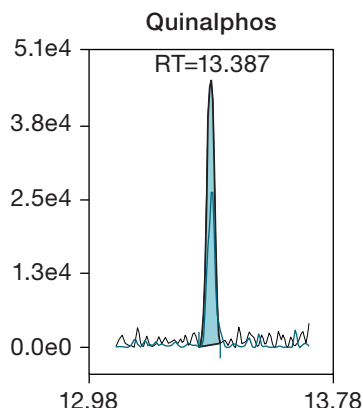
— Rene Urbansky, Eurofins SOFIA GmbH

Tefluthrin (5 µg/kg)		
S/N	Target IR	Calculated IR
159	33.53	36.41



Folpet (5 µg/kg)		
S/N	Target IR	Calculated IR
288	51.27	43.54

Quinalphos (5 µg/kg)		
S/N	Target IR	Calculated IR
23	64.12	58.08



Coumaphos (5 µg/kg)		
S/N	Target IR	Calculated IR
30	75.52	71.02

Figure 2. Examples of the detection of pesticides at 5 µg/kg in sunflower

Upon implementing the TSQ 9610, Eurofins SOFIA GmbH realized a significant time saving due to the Thermo Scientific™ Chromeleon™ Chromatography Data System (CDS) software. Mr. Urbansky elaborates on this, “Chromeleon facilitates data evaluation through high flexibility in terms of peak watching and filter functions. The possibility of evaluating many samples with a wide variety of calculation methods, with and without an internal standard, including standard addition on samples and calibration series on blank material is convincing. This has allowed for time savings of around 10% - 20% per sample run, since there is no need to manually enter the data into external tables.” Mr. Urbansky is also impressed with the NeverVent AEI source, “The NeverVent AEI source on the TSQ 9610 gave us a time saving of around 50% due to the ability to exchange the source, filament and column without venting the system.”

In the future, Eurofins SOFIA GmbH is looking forward to working with Thermo Fisher Scientific and will be transferring their PAH method onto the TSQ 9610 and looking into HRAM options. Mr. Urbansky explains, “We’ve had a very close cooperation with Thermo Fisher Scientific on this project and they have great know-how and are highly qualified. They responded quickly to any issues and had a high level of commitment to the project. We definitely intend to work with Thermo Fisher Scientific on a long-term basis and look forward to many new technical advances. For the future, HRAM technology as well as the Thermo Scientific Orbitrap Exploris GC, are also highly interesting to us.”

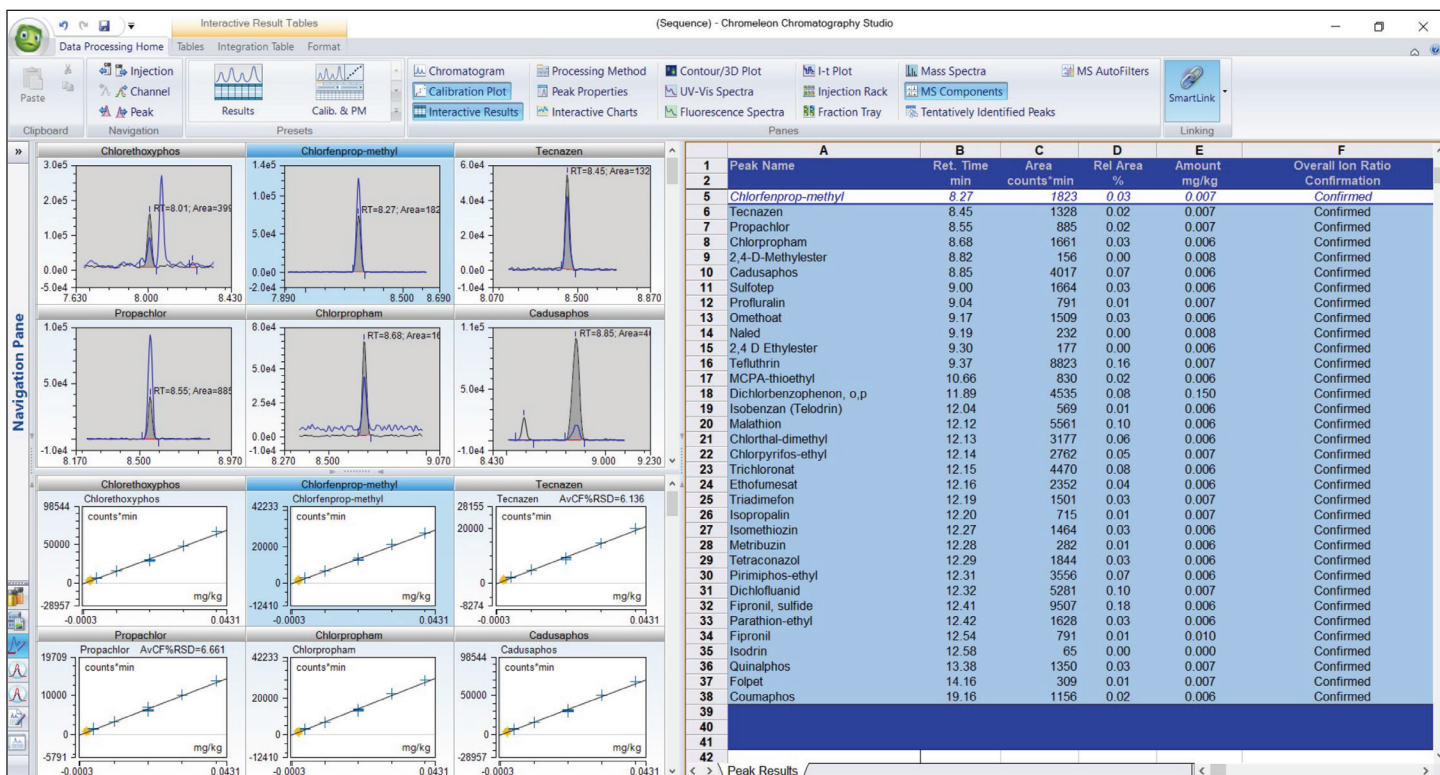


Figure 3. Chromeleon Studio enabling quick review of results

Conclusion

To analytical testing laboratories, ensuring a maximum sample throughput in food and environmental analysis is extremely important. The TSQ 9610 GC-MS/MS system offers significant advantages for targeted quantitative analysis, including:

- Increased sample throughput
- Reduction of data analysis time
- Reduction in instrument downtime
- Consistent results

All of these enable analytical testing laboratories to adapt to ever changing demands.

About Rene Urbansky

Mr. Urbansky completed his vocational training as a chemical-technical assistant in 2004. After completing the military service at the air force in Berlin, he joined Eurofins SOFIA GmbH in 2006. Initially, he focussed on sample preparation of different food matrices according to DFG S19, Alder and QuEChERS. In 2013, he took on the responsibility of GC data measurement and analysis at Eurofins SOFIA GmbH with the focus on Thermo Scientific GC instruments (Thermo Scientific™ TSQ™ 8000 GC-MS/MS, Thermo Scientific™ TSQ™ 8000 Evo GC-MS-MS, Thermo Scientific™ TSQ™ 9000 GC-MS/MS, Thermo Scientific™ TSQ™ 9610 GC-MS/MS). He utilized both Thermo Scientific™ TraceFinder™ and Chromeleon CDS software for data analysis on the systems. Since 2021, Mr. Urbansky works as the Technical Director of the GC laboratory.

About Eurofins SOFIA GmbH

As a long-standing member of the Eurofins Food & Feed Testing laboratories in Germany, Eurofins SOFIA GmbH is a trusted service provider for their broad, national and international customer base. The Berlin based laboratory supports producers, retailers and traders of both conventional and organic food and feed in ensuring the quality and safety of a wide variety of products, including cereals, grains, oil and oilseeds, and dried herbs. Eurofins SOFIA GmbH is one of Eurofins' core laboratories for the analysis of pesticides and residues of organic contaminants in food and feed, and processes a large volume of samples.

With the ability to analyze a variety of complex matrices, Eurofins SOFIA GmbH is also well positioned to serve further industries and support environmental monitoring through the testing of soil, water and other materials. Each year, Eurofins SOFIA GmbH processes more than 80,000 samples, which equates to over 6,500 samples each month and a phenomenal number of more than over 14 million parameters from 1600 different parameter types.

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