Fast, Flexible, Reliable GC Approaches for Improving Your Pesticide Workflows

Fast, reliable, and sustainable GC/MS/MS analysis of pesticide residues

You shouldn't have to choose between productivity and data quality for your pesticide residue GC/MS/MS methods. Multi-class pesticide analyses can be accomplished in under 10 minutes, while maintaining data accuracy, by using high-efficiency mini-bore columns in combination with a midcolumn backflushing technique.

Reliable

Mid-column backflushing is a technique used to extend both instrument and column maintenance intervals. The technique set up, as shown in Figure 1, can minimize column trimming and source cleaning. Figure 2 demonstrates how mid-column backflushing removes unwanted high boiling matrix contamination at lower oven temperatures allowing for faster run-times, extending column lifetime, and reduced contamination on the MS source.

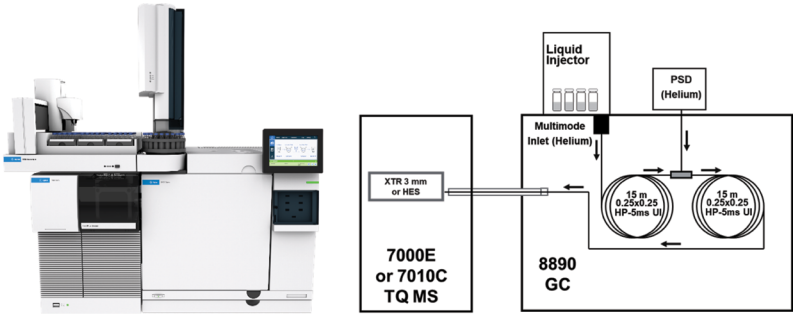

Figure 1. The Agilent 8890/7010C GC/TQ system with column system configuration.

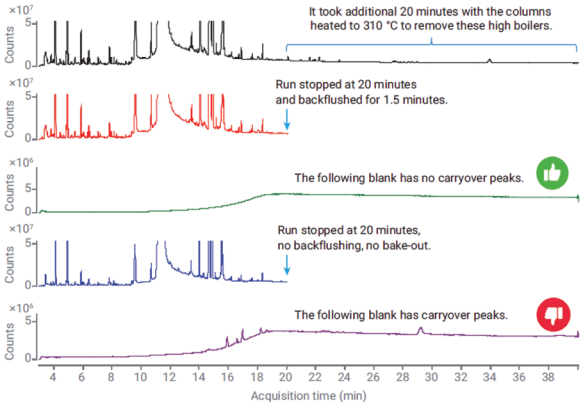

Figure 2. TIC Scan chromatograms of a cayenne pepper extract followed by the analysis of an instrument blank with column bake-out, with backflush and without backflush or bake-out.

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Sustainable

Helium is the optimal carrier gas for GC/MS. However, the popularity and adoptability of alternative carrier gases has risen in recent years due to factors such as unpredictable sources of helium, high costs effecting operating margins, and new technologies enabling higher productivity for customers using alternative carrier gases like hydrogen. If due diligence and proper measures are taken into account when translating methods, hydrogen brings chromatographic benefits and carrier gas supply sustainability. Since the introduction of the Hydroinert source, there have been multiple application notes demonstrating these benefits, resulting in faster run-times without sacrificing the integrity of your method. When using proper hardware with hydrogen carrier gas you can achieve similar run times to LC/MS/MS without sacrificing peak resolution as shown in Figure 3. Resulting in less gas consumption and extended routine maintenance intervals.

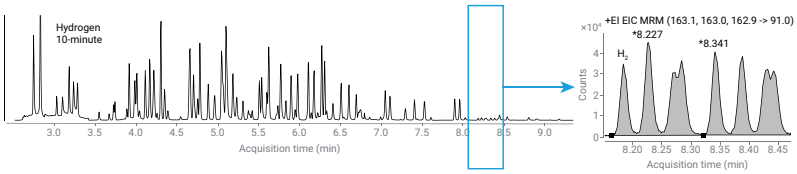

Figure 3. Chromatograms for a mixture of 103 pesticides acquired with hydrogen with the 10-minute method using a 10 m x 10 m minibore configuration.

Fast

Minibore GC columns balance sample capacity, robustness and efficiency, making them a great option for pesticide residue analysis. Minibore columns offer faster run-times and improved separation, which allows for higher sample throughput and can be implemented with lower development cost using method translator software. Figure 4 highlights the time savings potential of a 203 pesticide method using a 10 m x 0.18 mm x 0.18 µm minibore columns (PN 19091S-571UI) vs a conventional 15 m x 0.25 mm x 0.25 µm columns (PN 9091S-431UI).

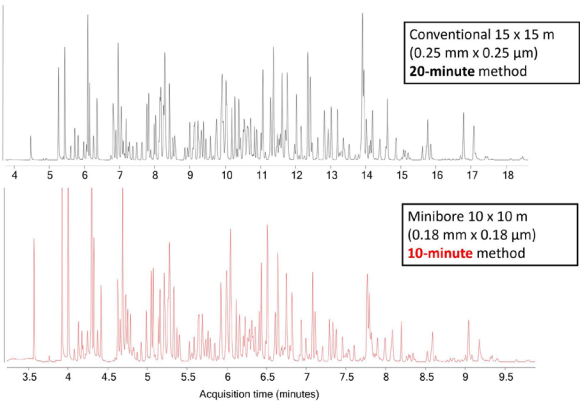

Figure 4. Chromatograms for a 203 pesticide mixture using conventional 15 x 15 m configuration and minibore 10 m x 10 m configuration.

Summary

Routine pesticide testing doesn't have to be a daunting task for laboratories. Incorporating some or all of the GC approaches presented in this flyer can enable a laboratory to increase productivity and workflow versatility. Please visit the resources below for an in-depth understanding of the following approaches used for pesticide analysis:

- **Hydrogen Carrier Gas for Analyzing Pesticides in Pigmented Foods with GC/MS/MS**
- **Five Keys to Unlock Maximum Performance in the Analysis of Over 200 Pesticides in Challenging Food Matrices by GC/MS/MS**
- **A Fast and Robust GC/MS/MS Analysis of 302 Pesticides in 10 Minutes in Spinach**

Description	Part Number
Analytical Columns	
J&W HP-5ms Ultra Inert GC column, 15 m, 0.25 mm, 0.25 µm, with smart key, 1/pk (need qty 2) (recommended for conventional and fast helium carrier gas method with conventional column configuration)	19091S-431UI
J&W HP-5ms Ultra Inert GC Column, 10 m, 0.18 mm, 0.18 µm, 7 inch cage, 1/pk (need qty 2) (recommended for fast Helium or fast hydrogen carrier gas method)	19091S-571UI
J&W HP-5ms Ultra Inert GC Column, 20 m, 0.18 mm, 0.18 µm, 7 inch cage, 1/pk (need qty 2) (recommended for conventional hydrogen carrier gas method)	19091S-577UI
GC Supplies	
Agilent Ultra Inert 2 mm Dimpled Liner	5190-2297
Gold-plated flexible metal ferrules	G2855-28501
Self-tightening collared column nuts for GC inlet	G3440-81011
Self-tightening collared column nuts for MS transfer line	G3440-81013
85:15 Vespel/Graphite Ferrules, 0.4 mm ID, 10/pk	5181-3323
Inlet septa, Advanced Green, non-stick, 11 mm, 50/pk	5183-4759
ALS syringe, Blue Line, 10 µL, fixed needle, 23/42/cone, PTFE-tip plunger	G4513-80220
Purge Ultimate Union (PUU) kit, deactivated	G3186-80580
Purged ultimate union (PUU) assembly, inert	G3186-60581
8890 with PSD (pneumatic switching device)	Option #310
Sample Containment	
Vials, screw top, amber, write-on spot, deactivated (silanized), certified, 2 mL	5183-2072
Caps, screw, blue, certified, PTFE/silicone/PTFE septa	5182-0723
Vial insert, 250 µL, deactivated glass with polymer feet	5181-8872
MSD Source Parts	
Filament, high temperature, EI ion source	G7005-60061
9 mm Hydroinert extraction lens* (recommended for H_2 carrier gas)	G7078-20909
Repeller - HydroInert	G7078-20902
Gas Filters	
Gas Clean carrier gas kit, 1-position, for 7890, 1/8 in. Includes one 1-position 1/8 in connecting unit; Purifiers: one carrier gas (p/n CP17973); one 7890 mounting bracket	CP17988
Gas Clean kit, for 8890 and 8860 GC. Includes mounting bracket, connecting unit, and carrier gas filter	CP179880
Gas Clean carrier gas purifier replacement cartridge	CP17973
Agilent big universal trap (recommended for H2 carrier gas)	RMSH-2-SS
Agilent Gas Clean purifier kit for carrier gas	CP17976
Hydroinert Source for Transition to H_2 Carrier Gas	
Hydroinert complete source assembly for 7000 TQ	G7006-67930
Hydroinert GC/TQ upgrade	5505-0084
Stainless steel installation kit	19199S
Software	
Standalone Pesticides and Environmental Pollutants MRM Database	G9250AA
MassHunter GC/MS Software Upgrade (including MassHunter Acquisition and MassHunter Qualitative and Quantitative Analysis)	G6845AA
MassHunter GC/MS Data Analysis Software	G6849AA

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