

ChroZen Triple Quadrupole GC/MS

chrozen TQ GC/MS

The Real Truth in Your Sample



chroZen TQ GC/MS

The primary consideration for the best selective and sensitive results

As the number of analysis for highly complex samples grows, you may feel the need to employ advanced technology to accurately characterize your samples as well as precisely determine the concentration of trace-level compounds.

ChroZen TQ GC/MS is the right solution to achieve greater insight of the samples with the extremely selective and sensitive data for quantitative and qualitative information and will lead you to the whole new level from the method setup to the data elucidation and instrument maintenance. Its structural characteristics such as 180° curved collision cell and lens-free optics eliminate the interferences of co-eluting compounds and neutrons, minimize the need of maintenance and simplify the method setup to maximize the ease of use.

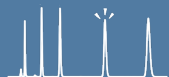


What do you consider most?



- High capacity of vacuum pump (Dual stage: 310L/s , 400L/s)
- Double filaments with electron-bouncing technology in the ion source

Productivity



- Multi-axis (360°) noise cancelling on ion path
- Efficient ion transmission in the lens-free design
- Helium focusing in the heated ion guide

Sensitivity



- The patented lens-free design
- Heated ion guide for prevention of ions condensation
- Ultra-inert materials in the ion source

Robustness



- CBS (Compound Base Scanning) for auto-fill of the optimized MRM transition
- Simplified parameter setup by the RF-only Collision Cell and lens-free ion optical path
- Intuitive GUI (Graphic User Interface) to speed up the operation

Ease of Use

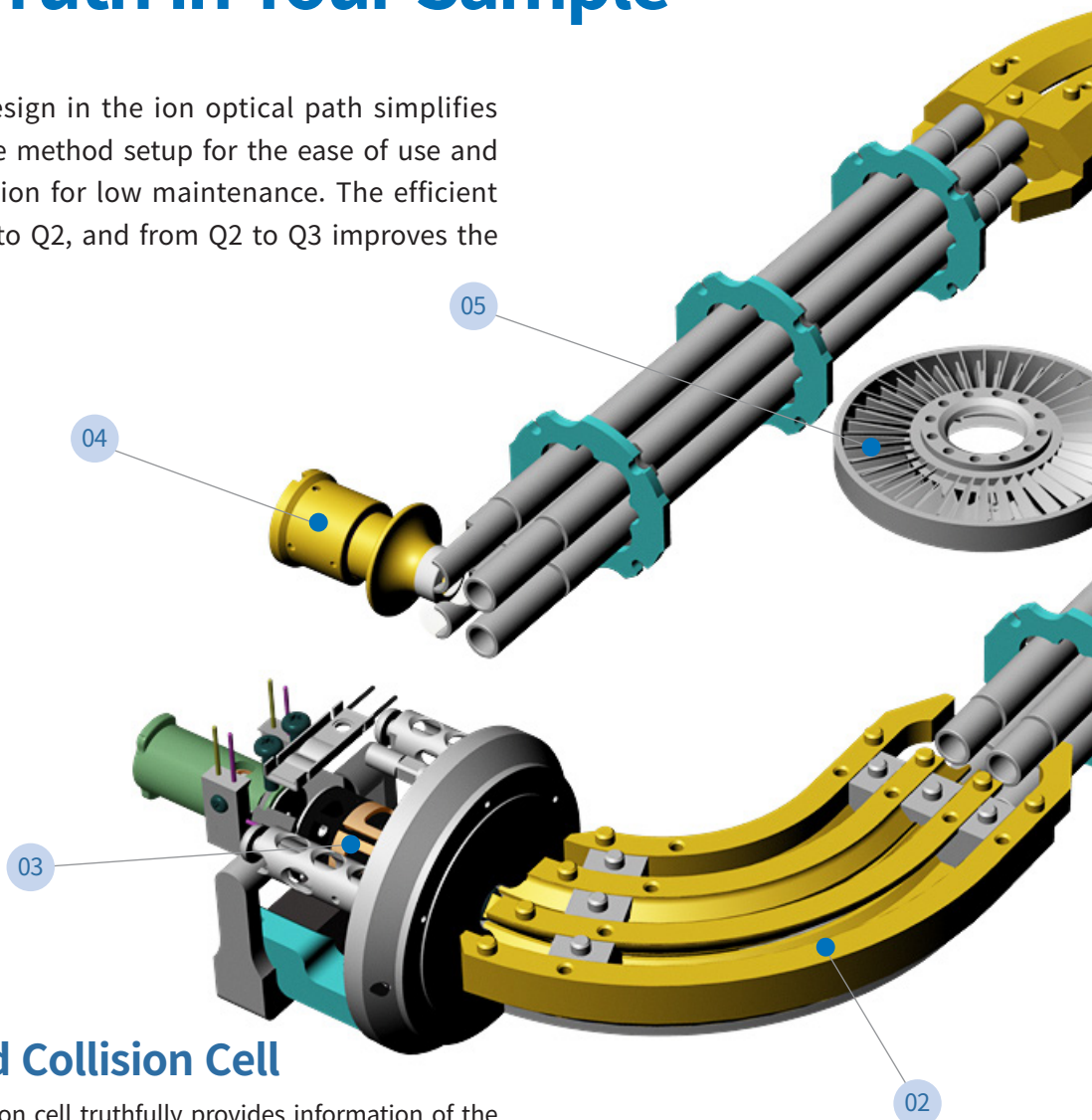


- Minimized contamination and reproducible fragmentation with the highly robust ion source

Reproducibility

The Real Truth in Your Sample

The patented lens-free design in the ion optical path simplifies the tuning process and the method setup for the ease of use and minimizes the contamination for low maintenance. The efficient ion transmission from Q1 to Q2, and from Q2 to Q3 improves the sensitivity for sure.

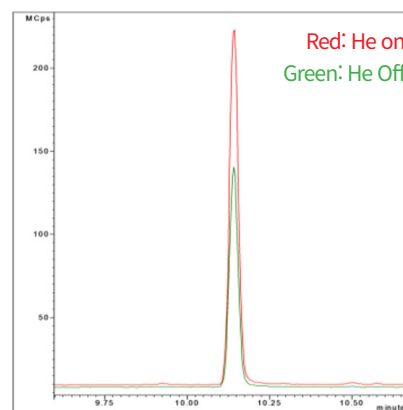


01 180° Curved Collision Cell

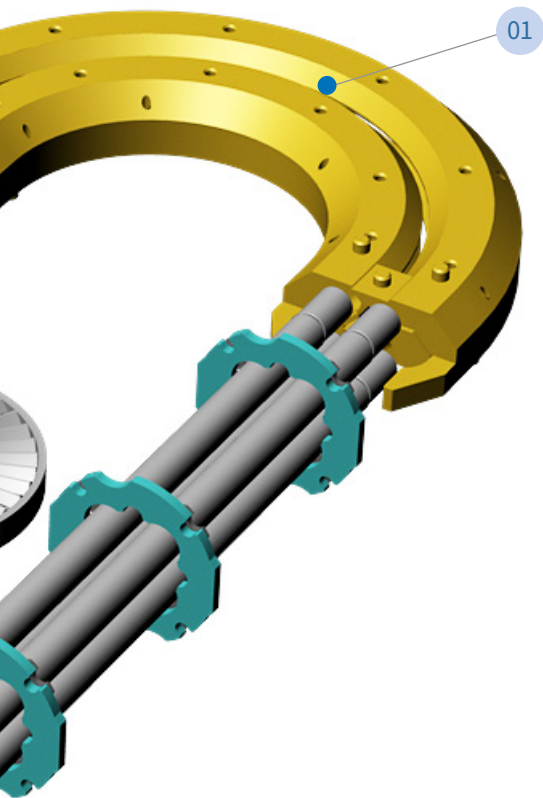
The unrivaled design of collision cell truthfully provides information of the structural elucidation and concentration of trace-level compounds. The fast moving ions from the first quadrupole collide with the collision gas, usually argon, and they get dissociated while removing the interference of neutrons in the 180° curved RF-only quadrupole. This reduces the background noise and increases the signal-to-noise ratio, which means it efficiently improves MRM sensitivity in real sample matrix.

02 Active Focusing Ion Guide

The 90° shaped ion guide curves the ions to eliminate neutrons and reduce noise. It's also heated to 135°C from the ion source for ions not to get condensed and contaminate the guide. There is a helium gas input to improve ion transmission so it provides a more focused ion stream that enhances the sensitivity.



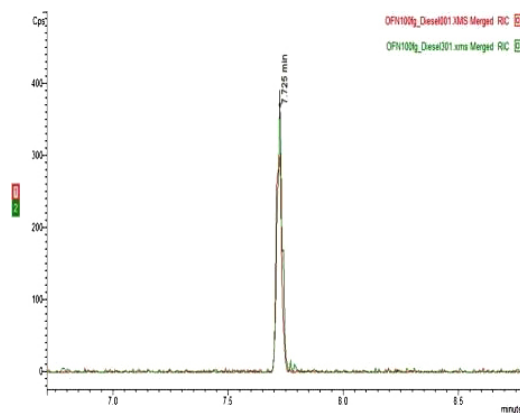
4-Bromofluorobenzene



03 Axial Ion Source

The axial ion source generates ions on-axis from the column and its unique design including inert lenses reduces the contamination by sample matrix for higher sensitivity. It utilizes double filaments with electron-bouncing technology to increase productivity without the instrument downtime for the maintenance.

The most popular ionization mode, EI (Electron Ionization), is supplied as standard. The CI (Chemical Ionization) is available as option and can easily be converted through plug-n-play module.



The overlaid chromatogram of 1% Diesel Oil matrix containing 100 fg OFN between no.1 injection and no. 301 injection.

04 EDR™ (Extended Dynamic Range) Detection System

Extended Dynamic Range (EDR) automatically adjusts the detector for the best signal-to-noise ratio (s/n) and EM voltage optimizes for every scan.

With large amount of compounds injection, the detector can be “overloaded”, which would lead the poor linearity by not giving the dynamic range of the instrument. This EDR enables the increased dynamic range for real life samples that are not predictable how much of your analytes are in there.

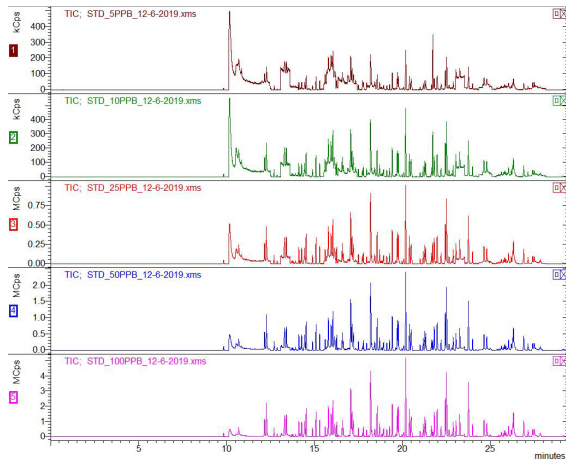
05 High Capacity of Turbo Pump

The high capacity of dual stage (310 L/s and 400 L/s) turbomolecular pump rapidly stabilizes the vacuum status for higher productivity.

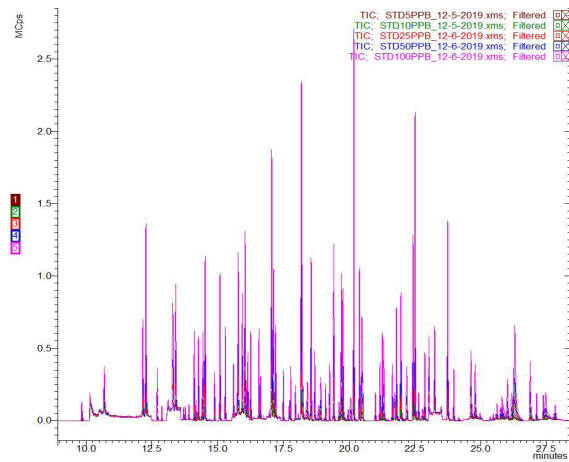
The following data shows the analysis of 113 pesticides by ChroZen Triple Quadrupole GC/MS according to the regulation listed in PLS (Positive List System) which facilitates safety managements for pesticides. The result satisfies the regulations which require 5 ppb level detection for each compound. (Available even at 0.5 ppb in actual data)

Analysis of 113 Pesticide Multi-residue

1) Total Ion Chromatogram

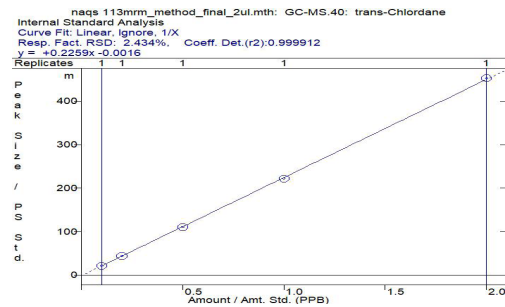
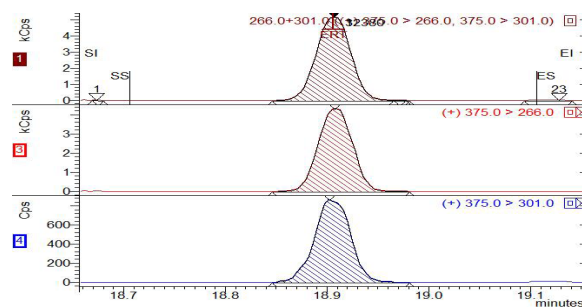
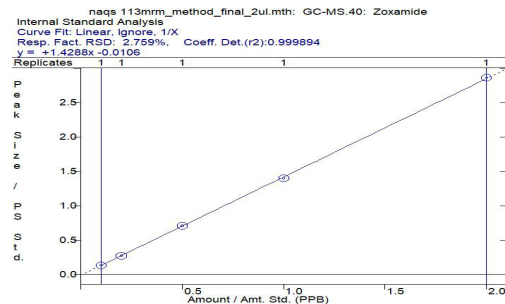
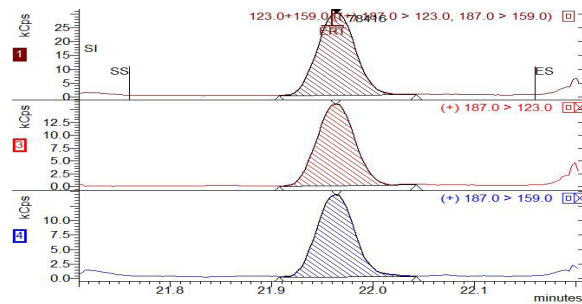
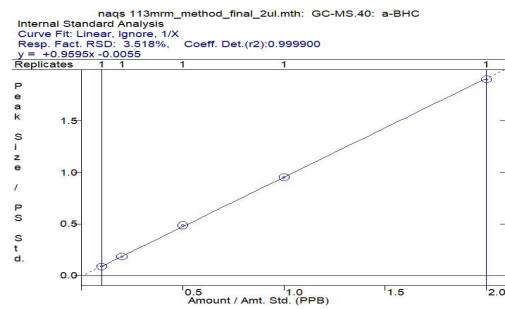
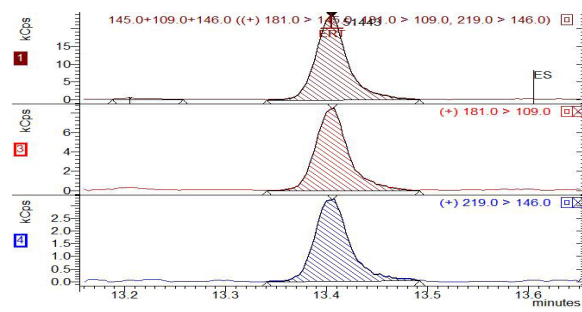


2) Total Ion Chromatogram(Overlay)



TIC chromatogram of 5, 10, 25, 50, 100 ng/mL(ppb) standards

3) EIC and Calibration curve



<5 ppb Qualitative / Quantitative Ion >

<5, 10, 25, 50, 100ng/mL(ppb)>

The software has never been easier before.

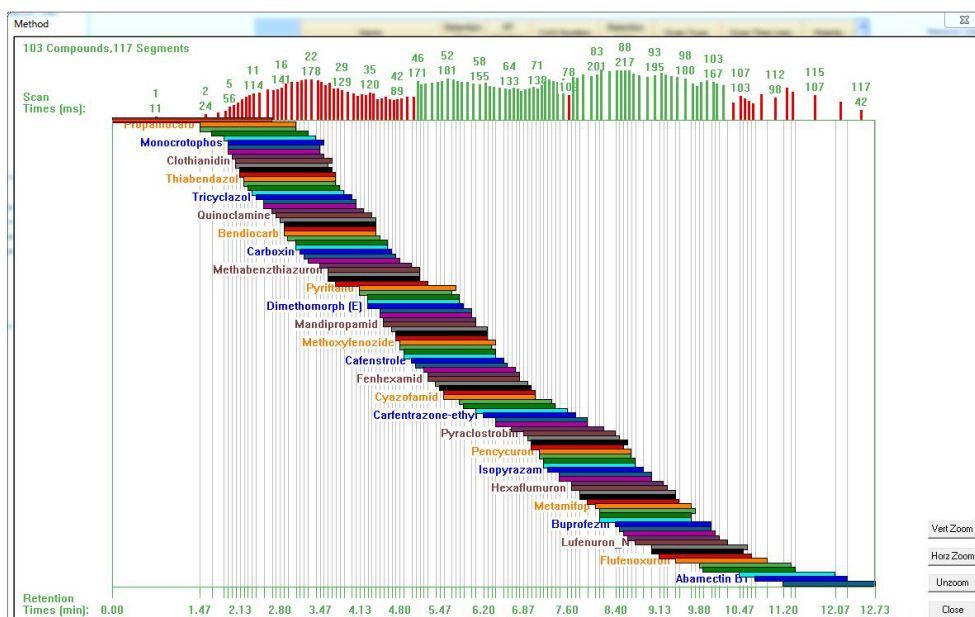
Utilizing MRM Method Builder, the Compound Based Scanning (CBS) automatically fills the individual MRM transition by the name of target compounds. Over 2500 MRMs with the associated collision energy simplify the method setup and manage the duty cycle of TQ GC/MS.

Name	Retention Time	RT Window	CAS Number	Retention Index	Scan Type	Scan Time (ms)	Polarity
1 Methanotrophs	6.83	0.50	10265-82-8	1211	MRM		208 Positive
2 Dichlorvos	6.15	0.50	63-73-7	1250	MRM		208 Positive
3 Nevinphos-Z	7.80	0.50	26710-65-0	1390	MRM		83 Positive
4 Nevinphos-Z	7.80	0.50	26710-65-0	1390	MRM		83 Positive
5 Monocrotophos	7.81	0.50	6923-22-4	1663	MRM		83 Positive
6 Hexaflumuron	7.88	0.50	86479-96-3	0	MRM		83 Positive
7 Endosulfate	8.19	0.50	2595-15-9	1409	MRM		83 Positive
8 Methacryfos	8.62	0.50	42615-77-9	1483	MRM		138 Positive
9 Carbaryl	8.79	0.50	63-25-2	1671	MRM		138 Positive
10 Taluthuron	8.83	0.50	34814-19-1	1482	MRM		138 Positive
11 Monale	9.13	0.50	2212-67-1	1639	MRM		138 Positive
12 Heptenophos	9.59	0.50	25665-59-0	1529	MRM		104 Positive
13 Oxathiale	9.81	0.50	1113-03-6	1558	MRM		69 Positive
14 Fenobucarb	10.80	0.50	3766-01-2	1567	MRM		69 Positive
15 Teprazine	10.88	0.50	117-10-0	1607	MRM		69 Positive
16 Propachlor	10.12	0.50	1918-96-7	1608	MRM		69 Positive
17 dimeton-S-methyl	10.17	0.50	918-88-8	1638	MRM		69 Positive
18 Diphenylamine	10.23	0.50	122-36-4	1588	MRM		69 Positive
19 Ethionphos	10.34	0.50	13184-48-4	1656	MRM		69 Positive
20 Chlorprophos	10.56	0.50	101-21-3	1626	MRM		69 Positive
21 Dioxatophos	10.84	0.50	141-66-2	1645	MRM		59 Positive
22 Trifluralin	10.89	0.50	1562-09-8	1668	MRM		59 Positive
23 Oxabenzofac(Saltfree)	10.90	0.50	3811-49-2	1600	MRM		59 Positive
24 Benfluralin	10.95	0.50	1881-45-1	1672	MRM		59 Positive
25 Pencycuron	11.80	0.50	6883-85-6	1696	MRM		59 Positive

Scan No	Scan Time (ms)	Collision Energy	Q1 Resolution	Q3 Resolution	Scan Time (%)	Qualifier Ion	Qualifier Ratio	Qualifier Ion
1	141.20	95.00	10.00	Standard	Standard	50.00%		✓
2	141.20	79.00	15.00	Standard	Standard	50.00%	30.00%	✓
3								✓
4								✓
5								✓

The rapid scan rate (up to 30,000 Da/sec) and the acquisition MRM rate (1,000 MRMs/sec) allows multiple transition to accurately monitor each compound with the superior sensitivity within a single run of analysis.

Applying the retention time of each compound, the scheduled MRM enables to acquire the enhanced MRM spectrum for the remarkable MRM sensitivity and speed up the method creation.



ChroZen GC at a Glance

Coupled with ChroZen TQ GC/MS

The brand new ChroZen GC with its fancy design and intuitive LCD display features substantially enhanced sensitivity and reproducibility by its **powerful UPC (Ultimate Pneumatic Control)** to enable more reliable and accurate data.

More Than Smart Things

Intuitive touchpad LCD display (10.1”) monitoring equipped modules (inlets, detectors, oven) at a glance and chromatogram as well as temperature programming in real time

More Than Innovation

- Substantially **enhanced sensitivity** by the efficient EMI (Electromagnetic Interference) shielding and other robust electronic parts
- **Pulsed pressure mode** (Split/Splitless): Instantly increased forefront pressure at injection minimizes the sample dispersion to provide significant sensitivity
- **Various detectors with superior sensitivity available**

More Than Reliability

- Powerfully designed UPCs(Ultimate Pneumatic Control) to optimize carrier gas control to provide exceptional accuracy and precision (**RT Repeatability SD < 0.0008 min**)
- 15 heated zones to achieve optimized thermal stability for each module (**Temperature Stability < ±0.01°C**)
- Ultra-high speed motor to speed up the oven cooling down time for improved productivity (**450°C→50°C: < 3.8 min**)

More Than Solution

- Various dedicated analyzers fully configured (Up to 9 UPCs) for food, pharmaceutical, petrochemical and environmental application field that are supporting numerous standard methods such as ASTM D1945, ASTM D2163, ASTM D4059, ASTM D4815/5580, ASTM D5623, ASTM D6730, ASTM D7823 and ASTM D8071
- Extended inlet pressure range (~150 psi)
- Safe use of Hydrogen as carrier gas for superior productivity and sensitivity by H₂ leak sensor
- SmartFlow Kit for backflush, 2D GC or heart-cut application to optimize analytical efficiency in multiple way



Enhance Your Laboratory Efficiency

ChroZen PAL LSI

ChroZen PAL LSI (Liquid Sample Injection) System can reach any three-dimensional position within its working space and is ideally suited to pick and place objects like vials. It can inject from several sample containers into different inlets or transport vials from a tray to a temperature controlled modules like the peltier stack for cooling them down to 4°C.

- Large sample capacity: 648 position of 2 mL vials
- Discrimination free injection: Ultrafast injection down to 100 msec reduces needle discrimination in GC to C40/C20 > 0.98



ChroZen PAL RSI/RTC System

ChroZen PAL RSI/RTC system can be adapted or extended to provide the combined injection techniques such as static headspace injection, liquid injection, SPME (Solid Phase Micro Extraction) and ITEX (In-Tube Extraction) dynamic headspace in one instrument. ChroZen PAL RTC system provides same reliability, flexibility and productivity as the RSI system but it additionally offers the robotic tool change that switches between different tools automatically.

Applying smart syringe technology with ID chip, it automatically preset all of syringe parameters, ranges and usage tracking for users' convenience.



Sample Preparation System



Versa
Headspace Autosampler

Versa Automated Static Headspace Sampler

Static headspace is one of the most popular techniques due to its versatility for analyzing volatile organic compounds (VOCs) in a complex variety of matrices. Versa is the perfect solution for applications which require all the advantages of headspace analysis and is economical to fit any budget.



HT3
Static and Dynamic Headspace
Autosampler

HT3 Automated Static and Dynamic Headspace Sampler

The HT3™ combines Static and Dynamic Headspace analysis techniques into one easy-to-use unit, saving you time, bench space and money. Built on proven static headspace technology, the HT3™ provides increased sensitivity from 50 to 100 times with the Dynamic Headspace option (dependent on compound), accurate and precise results with electronically controlled flow and pressure and single scheduling for multiple methods and techniques.



Atomx XYZ

Atomx XYZ Automated VOC Sample Prep System

The Atomx XYZ is the second generation combined soil/water autosampler and purge and trap concentrator system to analyze VOCs. It provides 84-position vial tray with optional vial chiller to 4°C and the improved moisture control system reduces the amount of water transferred to the GC.



Pyrolyzer

Pyrolyzer, Pyroprobe 6000 series

Pyrolyzer coupled with ChroZen GC allows you to analyze the samples such as paint, tapes, caulk, adhesives, food packaging, rubber, plastic, papers, ink, coating and a full range of household products without extractions or derivatizations for qualitative and quantitative information.

Specifications

ChroZen Triple Quadrupole GC/MS Specifications

Specification	
Ionization Mode	Electron Ionization (EI) as standard, available with Chemical Ionization (CI)
Ion Source	Auto-aligning ion source constructed of inert materials
q0 Ion Guide	90° curved RF-only entrance quadrupole with active ion beam focusing and heating at 135°C
Source Temperature	100 – 350 °C
Filament and Emission Current	Double filaments; up to 200 µA
Electron Energy	Adjustable from 0 – 150 eV
Mass Filters	Quadrupole with pre- and post-filters; high ion transmission efficiency, lens-free design
Collision Cell	180° curved path with pre- and post-filter regions
Collision Energy	Selectable up to 75 eV
Mass Range (m/z)	1 – 1,200 Da
Scan Rate	Up to 30,000 Da/sec
Minimum Dwell Time	0.5 msec
Maximum Acquisition MRM Rate	1,000 MRMs/sec
Resolution	User-adjustable from 0.7 – 4 Da
Mass Axis Stability	< ± 0.1 Da over 48 hours
Transfer Line Temperature	Up to 350 °C
Detector	EDR™ Electron multiplier with ±5 kV
Turbomolecular Pump	Dual stage, 310 L/sec and 400 L/sec

Mode	Test Condition (with Capillary inlet in hot splitless mode)	Sensitivity
EI Full Scan	1 pg OFN from m/z 50 to 300 for m/z 272	S/N ≥ 1,000:1
EI SIM	1 pg OFN for m/z 272	S/N ≥ 2,000:1
EI MRM	1 pg OFN for m/z 272>222	S/N ≥ 300,000:1
PCI Full Scan	10 pg BZP from m/z 80 to 230 for m/z 183	S/N ≥ 50:1
PCI MRM	1 pg BZP for m/z 183>105	S/N ≥ 1,500:1
NCI Full Scan	1 pg OFN from m/z 200 to 300 for m/z 272	S/N ≥ 4,000:1
NCI SIM	1 pg OFN for m/z 272	S/N ≥ 40,000:1



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