

Tandem gas chromatography-mass spectrometer

GCMS-TQ8050

UFMS
ULTRA FAST MASS SPECTROMETRY



New opportunities for highly sensitive analysis

The unsurpassed level of sensitivity of the new tandem chromatography-mass spectrometer (GC-MS/MS) opens up new possibilities for the determination of ultratrace amounts of target compounds.

The level of sensitivity is one of the highest in the world

- A new highly sensitive detector enables determination of target compounds at the femtogram level.
- Three patented noise suppression technologies allow to achieve one of the highest levels in the world signal-to-noise ratio (40,000:1 EI, 100 fg OFN, m/z 272 → 222).

Highest performance

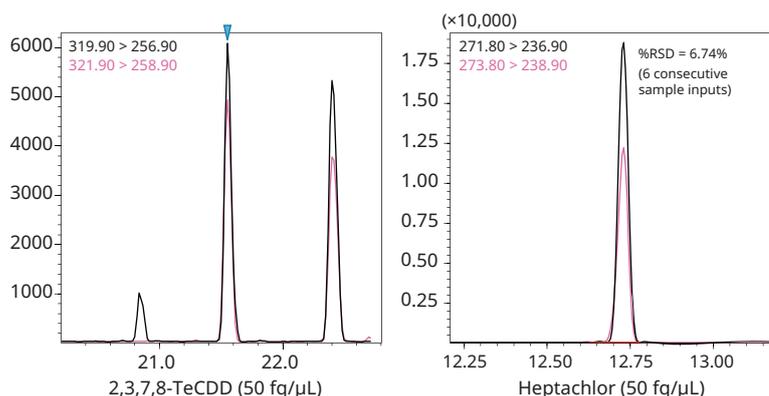
- This advanced vacuuming system maintains a deep and stable vacuum in the mode tandem mass spectrometry, making it possible to carry out accurate quantitative determination of trace amounts of target compounds.
- Due to the possibility of performing analysis simultaneously in tandem mass spectrometry mode and mode scanning of the full mass range (MRM/Scan) completely excludes the risk of not detecting any components in the analyzed sample.
- Combination of high-speed scanning technology without loss of sensitivity ASSrtm and the highly efficient UFsweepertTM collisional dissociation cell enable fantastic tandem mass spectrometric analysis performance.
- The possibility of simultaneously connecting two capillary columns to the MS detector is significantly reduced time costs associated with replacing speakers.

High reliability and long-term operation

- The detector does not require significant signal amplification to determine ultratraces quantities of substances, thanks to which the life of the detector increases five times without reducing sensitivity.
- The new oil-free pump makes it possible to reduce the frequency and cost of the periodic several times service.

Application

With improved analytical performance, the new GCMSTQ8050 tandem gas chromatograph-mass spectrometer enables the determination of ultra-trace amounts of dioxins and other persistent organic pollutants in feed, food and the environment, where only high-resolution GCMS systems have long been used:



Technical characteristics

Gas chromatograph		GC-2010Plus
Max. thermostat temperature		450 °C
Max. number of temperature program steps		20
Max. injector temperature.		450°C
Carrier gas pressure range at column inlet		0.5-970 kPa
Max. carrier gas flow rate through the injector		1200 ml/min
Mass-selective detector		
Ion source		
Ionization systems	EI: NCI:	EI (electronic shock) EI, CI (positive chemical ionization), NCI (negative chemical ionization)
Filament:		Double (automatic switching); ionization energy 10–200 *+; emission current 5–250 μA
Vacuum system		
Main pump		Differential turbomolecular pump (190+170 l/s).
Forevacuum pump		Oil rotary pump 30 l/min (60 Hz). Oil rotary pump 110 l/min (60 Hz)
Mass analyzers		
Analyzers Q1 and Q3		Metal quadrupole with prefilter
Co-impact center		Fast UF sweeper cell
Max. co-impact dissociation energy		60 eV
Co-impact dissociation gas		Argon
Mass range		10-1090 m/z
Resolution		0.5-3.0 a.e.m. (full width at half maximum).
Mass Determination Stability		± 0.1 a.m.e./48 h (at constant temperature)
Operating modes		
		Q1 SCAN, Q3 SCAN, Q1 SIM, Q3 SIM, MRM, Precursor ion scan, Productions scan, Neutral loss scan or any combination of all of these modes in one analysis, including SCANIMRM
Scan (SCAN)		
Maximum scan rate		20,000 a.m.e./s
Scan rate control technology		ASSPTTM (Advanced Scan Rate Control Technology)
Minimum time		3 ms (up to 333 scans per second)
SIM/MRM		
MRM registration rate		> 800 MRM/
Minimum MRM registration time (dwelltime)		< 0.5
Maximum number of registered MRM transitions per analysis		32768 MRM transitions
Detector		
		Secondary electronic multiplier with patented lens and conversion dynode
Sensitivity		
Instrumental detection limit IDL: EI, MRM, 2 fg OFN m/z 272 → 222:		< 0.5 fg (IDL statistically calculated from the peak area for 8 replicates of consecutive analysis and a confidence level of 99%)
EI, Scan, 1 fg OFN m/z 272		S/N < 2000
EI, MRM, 100 fg OFN m/z 272 → 222		S/N 240,000
CI, MRM, 1 pg benzophenone-d 10 m/z 193 → 110		S/N > 5000
NCI, SIM, 100 fg OFN m/z 272		S/N ≥10,000
Software		
GCMSsolution		Software for controlling the operation of the chromato-mass spectrometer and processing the analysis results AART function for automatic setting of retention times; Smart MRM - automatic method creation function in tandem mass spectrometry mode
LabSolutions Insight		For processing large arrays of quantitative data
Mass Spectra Libraries		
		NIST, Wiley, MPW (narcotic, poisonous, polluting compounds, pesticides and their metabolites)FFNSC (Natural and Synthetic Fragrances), Pesticide Library, Lipid Library, Designer Drug Library
Ready databases		
		Quick-DB - screening databases of various compounds SmartDB - databases containing optimized measurement parameters - in the mode of tandem mass spectrometry for the determination of pesticides, drugs, metabolites, polluting compounds, etc.



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