Finnigan TRACE DSQ GC/MS

Discover Unmatched Sensitivity, Performance and Value

Full-scan sensitivity for the demanding environmental analysis

Proven performance for difficult forensic matrices

Extend the range of sample analysis with the addition of solids probes for material characterization or unknown analysis

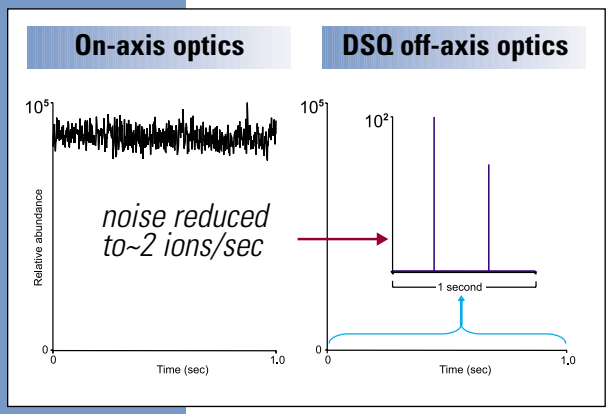
Finnigan TRACE Dual Stage Quadrupole

In keeping with a long tradition of excellence, Thermo Electron Corporation introduces the Finnigan™ TRACE™ DSQ™, an instrument that will change the way you think about GC/MS analysis.This benchtop system takes trace level analysis into the future – with a design innovation that offers a fundamental improvement in your analytical results.

Less Noise = Better Data

For years, the enemy of optimum GC/MS detectivity has been noise. Background noise arises from multiple sources: sample matrix, column bleed, and source-generated noise (excited neutrals). Sample cleanup and routine column maintenance can help reduce two sources of noise. The third, neutral noise, is more challenging. Many GC/MS systems address the issue by simply background subtracting or "thresholding" out the noise. However, by masking this low level response, critical isotope ions may be lost or compromised and available dynamic range reduced. This can limit both sensitivity and quantitative capability.

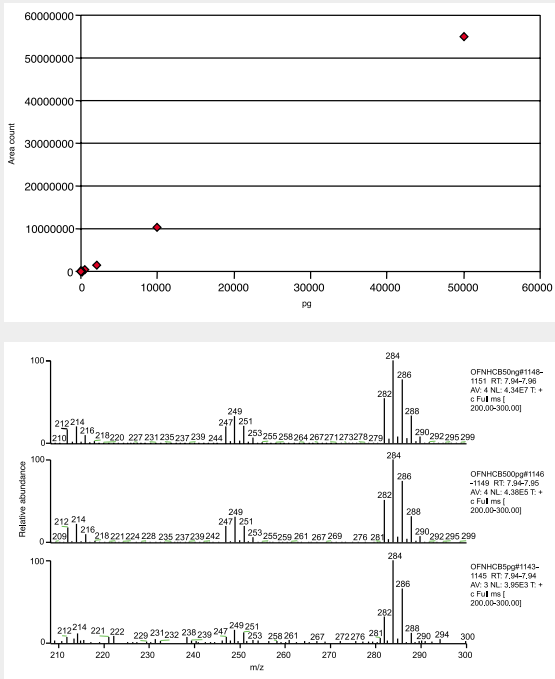
Now, Thermo scientists have found a way to virtually eliminate source noise before it reaches the MS detector. Inserting a curved quadrupole pre-filter provides a path that excited neutrals cannot navigate. They are effectively removed and can no longer add noise to the baseline. By eliminating, rather than masking the noise, Finnigan TRACE DSQ obtains improved detectivity without sacrificing dynamic range or spectral integrity.



Off-axis optics in the DSQ provide a quantitative reduction in neutral noise versus a straight-line quadrupole system.

EI Full-Scan Linearity and Spectral Purity of Hexachlorobenzene

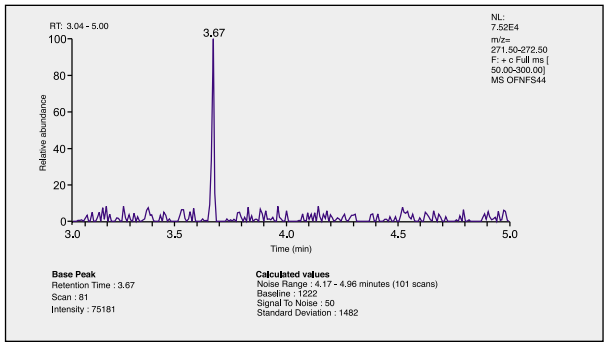
5, 20, 100, 500, 2000, 10000, 50000 pg



Linearity for 5 pg to 50 ng of HCB in full-scan mode with a linear fit of $R^2 = 0.9996$.

Confident Library Searches Regardless of the Concentration

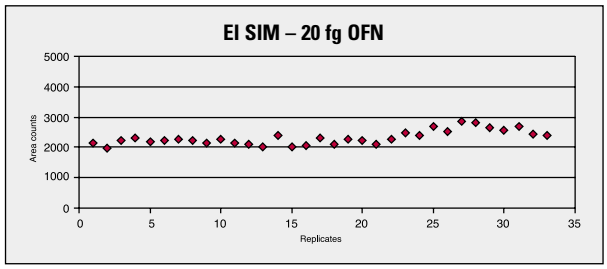
Unknowns are just that: unknown in composition and unknown in concentration. The DSQ's extended dynamic range provides analytical precision at the trace femtogram level as well as the high nanogram level. In addition to quantitative dynamic range, the GC/MS must provide spectral consistency over the same dynamic range to produce confident library searching regardless of the level. The Finnigan TRACE DSQ delivers this by combining the noise reduction of the curved pre-filter with the robust performance of the ion source.



Full-scan analysis of 1 pg octafluoronaphthalene (OFN) showing superior signal/noise.

Rugged and Reliable EI Full-Scan Performance

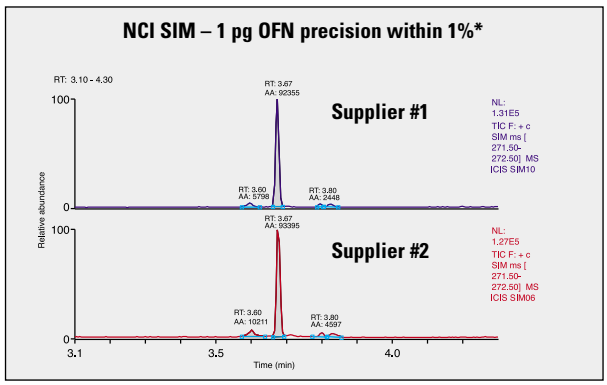
Electron Ionization (EI-MS) is the choice for most routine GC/MS analysis. Whether an application requires the spectral characterization and library matching of full-scan MS or demands the ultimate analytical sensitivity of Single Ion Monitoring (SIM), the system must be flexible to meet any challenge. It must also be rugged enough to perform the job, day in and day out. The Finnigan TRACE DSQ meets these stringent requirements.



Sensitivity with rock-solid stability – replicate injections of 20 fg OFN over 24 hours.

Unmatched Positive and Negative Chemical Ionization Capabilities

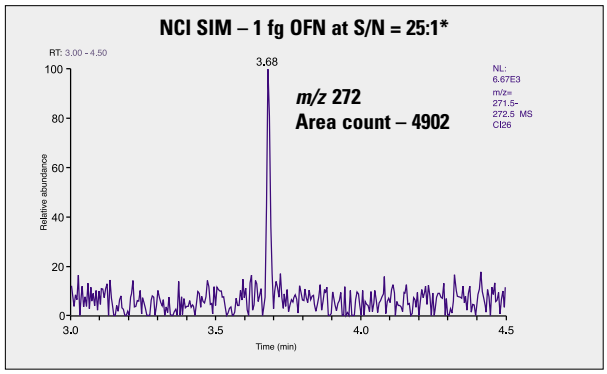
The Finnigan TRACE DSQ shatters previous barriers to quantitative sensitivity in CI-SIM mode. Combining the new design of the ion optics with the outstanding performance of the Finnigan TRACE GC, the Finnigan TRACE DSQ provides amazing analytical detectivity in the ultra-low femtogram range.



Enhanced design delivers precision and accuracy–spot-on agreement between second-source standards.

Extra Sensitivity When You Need It

The ability to detect trace amounts of compounds can mean less prep time, smaller injections, less sample, more confidence – real productivity. Finnigan TRACE DSQ's innovative design gets you closer and closer to that single molecule.



NCI selectivity combined with off-axis noise reduction for ultimate detectivity.

** Examples shown are raw data – no background subtraction, no baseline smoothing.*

Making Precision GC/MS Affordable

Experience True GC/MS Productivity

Sensitive, robust, expandable, and affordable – Finnigan TRACE DSQ offers maximum value for your instrument investment

Fast Scanning at 10,000 amu/sec

The industry's fastest scan speed for single quadrupole systems. Faster scanning meets the requirements of fast chromatography. More data points help define very narrow peaks for precise and accurate quantitation.

Removable Ion Volumes

Complete your major source maintenance without tedious source disassembly. Add the Vacuum Interlock to replace ion volumes without venting the system and begin analyzing samples in under three minutes!

Take care of your source maintenance without venting the system with the optional Vacuum Interlock.

Simultaneous SIM and Full-Scan Data Acquisition

Combine the ultimate sensitivity of SIM target compound analysis with the confidence of full-scan library searching for identification of unknowns, all in a single analysis.

Removable Pre-filter

Traps the "dirt" that contaminates sensitive quadrupoles. Now there's no need to clean or exchange your quadrupole assembly, simply clean the pre-filter and re-install. You are up and running!

The removable pre-filter is easily cleaned. Dirty samples aren't a problem.

Finnigan TRACE GC – The Essential DSQ Partner

It really doesn't matter how advanced the technology in the mass spectrometer is if the GC cannot deliver the sample reliably and robustly. The process of GC/MS begins with the gas chromatograph.

Experience the performance of the industry-leading split/splitless, PTV, and innovative Cold-On-Column Large Volume injectors. Finnigan TRACE GC from Thermo offers inlet technology to meet any sample requirement.

The GC can be configured with up to two traditional detectors including FID, TCD, ECD, FPD, NPD, PDD and PID. The Xcalibur™ data system controls each detector and simultaneously acquires data from the two analog detectors and the DSQ mass spectrometer.

Lock in Retention Time at the Touch of a Button

The Finnigan TRACE GC virtually eliminates retention time shifts caused by column-to-column variations. With the proprietary Column Evaluation feature on the GC, simply install the column and push the Column Eval button on the keypad. The Finnigan TRACE performs an automatic calibration of the column to give precise and repeatable flows from column to column. This calibration ensures that your retention times will hold no matter how often you change the column, saving you the time and frustration of drifting retention times for your target compounds.

Finnigan TRACE DSQ Features

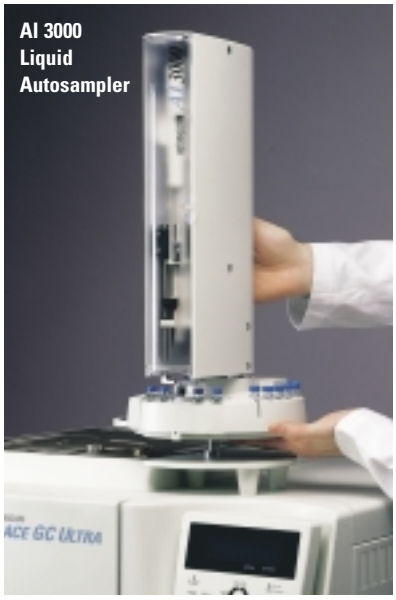
- Mass range of 1 – 1050 amu
- Scan speeds up to 10,000 amu/sec (profile and centroid)
- Curved pre-filter for noise reduction
- ± 10 kV conversion dynode for better performance
- Wide spectral/quantitative dynamic range
- Removable ion volumes for EI and CI
- Combination ion volume for automated EI/CI operation
- Powerful Xcalibur data system

Analytical Versatility

- EI mode for identifying unknowns – library search information
- PCI for molecular weight confirmation
- NCI for ultimate sensitivity and selectivity
- Simultaneous full-scan and SIM in a single analysis
- PPINICI – hardware/software option with alternating PCI/NCI scans for sample screening

Expanded Capabilities

- Vacuum interlock
- Liquid and headspace autosamplers
- DEP/DIP solids probes
- High-capacity differential pumping system
- Two positions available for traditional GC detectors



AI 3000
Liquid
Autosampler

Target Unknowns with Powerful Tools

Expand capabilities with the Positive and Negative CI option and/or Solids Probe for non-GC sample introduction

Chemical Ionization for Molecular Weight Confirmation and Enhanced Selectivity

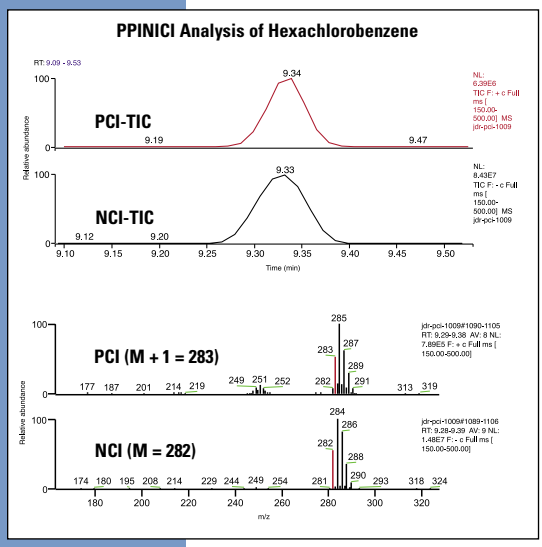
Determining molecular weight is a must for today's high throughput combinatorial chemistry laboratory. Whether it is for natural products, drug discovery, or an organic synthesis operation this technique answers the crucial question – *Is it what I think it is?*

In addition to molecular weight determinations, negative ion chemical ionization can provide enhanced selectivity, hence detectivity, of certain classes of compounds in complex matrices. This can improve your ability to detect target compounds as well as quantitate them at low levels in very dirty samples.

Finnigan TRACE DSQ makes the process of performing chemical ionization simple, routine, and robust.

Pulsed Positive Ion Negative Ion CI (PPINICI)

Thermo's smart hardware/software option lets you perform both PCI and NCI on alternating scans. Xcalibur automatically filters the data for easy viewing and more confident molecular weight analysis or sample screening.



Simultaneous molecular weight confirmation of Hexachlorobenzene in positive ion $[M + H]^+$ and negative ion $[M]^-$.

Exchangeable Ion Volumes

No need to vent your system to perform a source swap. Simply exchange your EI ion volume with the CI or EI/CI combo ion volume through the vacuum interlock (included with the CI option), and continue your analysis – in under three minutes.

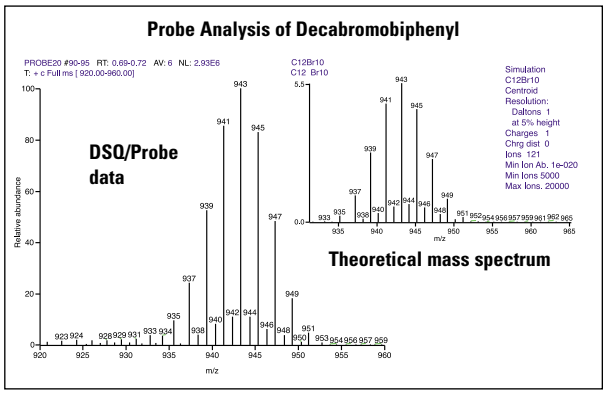
Finnigan TRACE DSQ ion volumes

Digital Reagent Gas Control

Finnigan TRACE DSQ's digital control stores the CI flow setting with each method guaranteeing the same critical flow, day to day, week to week, operator to operator. No more tedious setup to manually adjust the reagent gas to reproduce previous work.

Solids Probe

Probe analysis allows rapid qualitative screening of bulk samples or analysis of thermally labile compounds which degrade in the GC inlet. Interchangeable probes allow you to quickly switch between Direct-Exposure (DEP) or Direct-Insertion Probe (DIP), depending on the sample.



Solids probe analysis of the flame retardant Decabromobiphenyl (MW 943), compared to a theoretical mass spectrum.

Xcalibur – A Unified Platform for MS

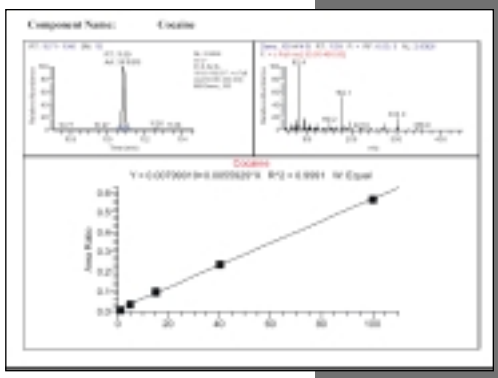
One intuitive platform for GC/MS, LC/MS and Advanced MS instruments provides confident control from method development to reporting

Xcalibur is the most powerful data system available today, delivering a unique combination of functionality, control, and ease of use. The software is designed to guide you through your daily tasks.This powerful simplicity, combined with the advanced features of the Microsoft® Windows® operating system and Microsoft Office productivity tools provides an analytical platform second to none.

Xcalibur is organized around the Home Page. This starting point directs you to the six major functions of Xcalibur: Instrument Setup, Sequence Setup, Processing Setup, *Qual* Browser, *Quan* Browser and Library Browser. This design allows you to quickly and easily access the area you need to work in without having to page through additional programs.

Finnigan TRACE DSQ generates library-searchable spectra regardless of matrix and concentration. This is a vital asset when dealing with complex unknown samples. Use commercial libraries, NIST, Wiley, Pfleger-Maurer-Weber or build your own. Xcalibur allows simple exporting of spectra and has powerful editing tools to aid you in quickly generating your own user libraries. Xcalibur allows you to search multiple libraries simultaneously. Thus you can easily match your unknown against multiple sources for confident identification.

Xcalibur provides complete control of the Finnigan TRACE GC, DSQ mass spectrometer and optional liquid or headspace autosamplers. Xcalibur contains a built-in audit trail to ensure compliance with your laboratory's SOP's and Quality Programs.



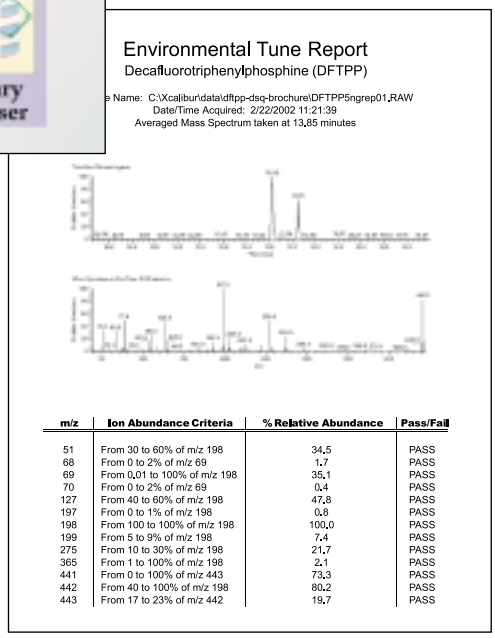
Generating and producing reports from your data has never been easier than with the Merlin reporting package in Xcalibur. Merlin allows you to quickly specify each piece of information, mass trace, instrument setting, etc. to include in your report. Simple drop-down menus and "drag-and-drop" objects provide complete flexibility for your reporting needs.

Xcalibur Unifies All The Technologies We Offer

- Reduces the learning curve
- Simplifies the addition of new technology platforms
- Improvements are shared across all systems

Integrates Layered Applications, Including

- **Open Access™** – Select from predefined methods for "click and go" sample analysis
- **EnviroLab Forms** – Automated reporting forms package designed for the regulated environmental laboratory
- **Mass Frontier™** – Interpret mass spectral data with tools for fragments, structures, isotope patterns, spectral classification and more



Environmental Tune Report
Decafluorotriphenylphosphine (DFTPP)

e Name: C:\Xcalibur\data\dftpp-dsq-brochure\DFTPP5ngrep01.RAW
Date/Time Acquired: 2/22/2002 11:21:39
Averaged Mass Spectrum taken at 13.85 minutes

m/z	Ion Abundance Criteria	% Relative Abundance	Pass/Fail
51	From 30 to 60% of m/z 198	34.5	PASS
68	From 0 to 2% of m/z 69	1.7	PASS
69	From 0.01 to 100% of m/z 198	35.1	PASS
70	From 0 to 2% of m/z 69	0.4	PASS
127	From 40 to 60% of m/z 198	47.8	PASS
197	From 0 to 1% of m/z 198	0.8	PASS
198	From 100 to 100% of m/z 198	100.0	PASS
199	From 5 to 9% of m/z 198	7.4	PASS
275	From 10 to 30% of m/z 198	21.7	PASS
365	From 1 to 100% of m/z 198	2.1	PASS
441	From 0 to 100% of m/z 443	73.3	PASS
442	From 40 to 100% of m/z 198	80.2	PASS
443	From 17 to 23% of m/z 442	19.7	PASS

Finnigan TRACE DSQ – Sensitivity and Speed in any Configuration

The combined features of the Finnigan TRACE DSQ and Xcalibur software means no sample is too tough to handle. The ultimate sensitivity in SIM mode combined with the spectral accuracy in full-scan mode assures that any experiment can be a success.

Robust and sensitive, the Finnigan TRACE DSQ is the perfect choice for the demanding applications typically found in high volume environmental or toxicology laboratories.

DSQ Configurations

The Finnigan TRACE DSQ is available in three pumping configurations. From the basic 70 L/s turbomolecular pump to the advanced split-flow differentially pumped instrument, we can configure the system that meets your needs and budget.

Finnigan TRACE DSQ Configurations	ELECTRON IONIZATION	CHEMICAL IONIZATION PROBE, PPINICI	HIGH COLUMN FLOW, LVI
70 L/s Turbo Basic system for general EI applications, SIM or library confirmation in full-scan mode. Add GC detectors, and upgrade with autosamplers and selected MS options	X		
250 L/s Turbo Increase sensitivity and performance in EI. Add Chemical Ionization for molecular weight deterimi-nations or high sensitivity NCI-SIM quantitation.	X	X	
200/200 L/s Split-flow Turbo Advance to the ultimate system with the differential pump which delivers best resolution and unmatched performance for PCI/NCI and ultra-trace levels.	X	X	X

In addition to these offices, Thermo Electron Corporation maintains a network of representative organizations throughout the world.

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