

CONSISTENTLY IDENTIFY CONTROLLED SUBSTANCES IN EVIDENCE SAMPLES

The Measure of Confidence



Agilent Controlled Substance Analyzers

Traditional GC/MS analyses and library searches involve simple routines based on large amounts of relatively pure substances. Unfortunately, this is not sufficient for analyzing multi-component samples – such as synthetic cannabinoids sprayed onto botanical mixtures. Conventionally these complex, emerging drugs must be identified and quantified manually, which is labor intensive and potentially inconsistent. This is unacceptable in forensic labs struggling with limited resources and higher operational costs – due, in part, to the rising price of helium.

Get application workflows up and running reliably from *day one*

Agilent Controlled Substance Analyzers are based on the Agilent 5977A MS with the 7890B GC. Each is factory pre-tested and pre-configured to save precious start-up time, optimize sample throughput, and balance your cost of operation with innovations such as:

- A thermal insulated oven insert that shortens cycle time to 13 minutes, compared to 21 minutes with conventional configurations
- The ability to use helium or hydrogen as a carrier gas
- An Ultra Inert flow path to ensure that target compounds reach the MS detector
- A Controlled Substances Database containing more than 460 compounds – including new psychoactive substances, such as synthetic cannabinoids and bath salts

Agilent Controlled Substance Analyzers reflect innovative technology, high chromatographic performance, and stringent quality control. Systems include:

Factory

- System setup and leak testing
- Application configuration
- Installation of appropriate columns/accessories
- Chemical performance verification with application-specific checkout mix

Delivery

- Instrument and method manuals
- CD-ROM with method parameters and checkout data files for easy out-of-the-box operation
- Application-related consumables included – no separate ordering required
- Easy consumables re-ordering information

Installation

- Duplicate factory checkout with checkout sample – onsite by factory-trained support engineer
- Optional application startup assistance

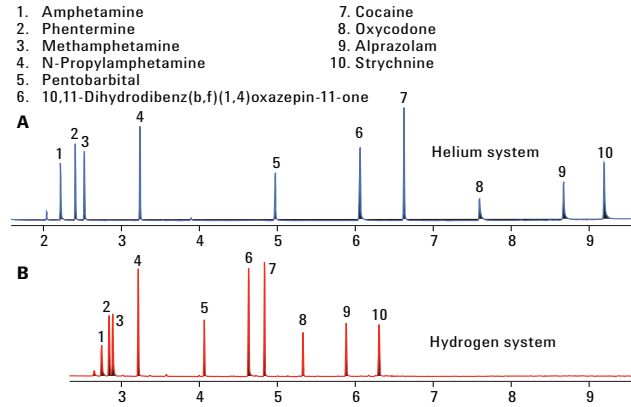


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Technological advances improve performance and ensure consistent results between systems, operators, and labs

Producing data that stand up to legal scrutiny demands reproducible results throughout your laboratory network. You can improve data consistency – while increasing throughput and minimizing downtime – with the Agilent Controlled Substance Analyzer. It features:

- The choice of helium or hydrogen carrier gas to help your lab control operational costs
- Deconvolution Reporting Software (DRS) for fast data review in 2-3 minutes per sample, with screening and quantitation in one run
- Retention Time Locking (RTL) for consistent retention times after column maintenance and easy matching with the DRS Controlled Substances Database
- Capillary Flow Technology (CFT) and backflush that shorten run times, minimize chemical background, extend column life, and reduce frequency of source cleaning



Rapid analysis with helium or hydrogen carrier gas. Compared to standard He systems, Agilent Controlled Substance Analyzers shorten cycle time, reduce gas consumption, and improve throughput.

With a simple change to the column-MSD connection, retention times remain consistent under both operating conditions.

Here's the same separation, using DRS identification

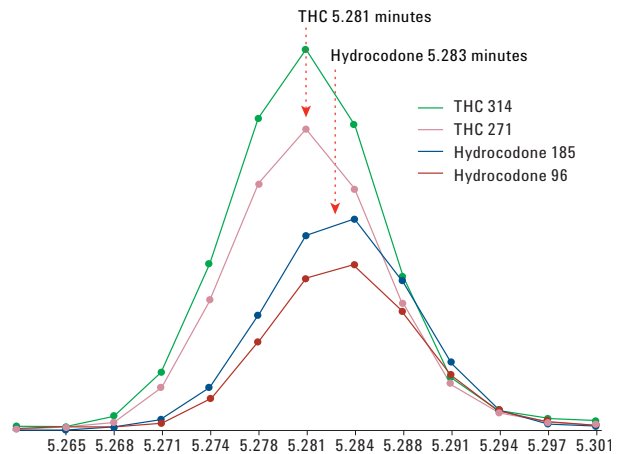
You will notice that it reveals **two peaks**, separated by only 0.002 min. – less than 1 scan.

What makes DRS so unique?

DRS combines the power of **three** compound identification programs: MSD ChemStation, AMDIS 32, and NIST 09. Then, it confirms the targets using deconvoluted full spectra from AMDIS.

With the 3-in-one advantage of DRS, you can find targets that conventional data analysis can miss, with fewer false positives and negatives – and with less operator bias on data review.

With these powerful tools, the Controlled Substances Analyzer helps your operation increase productivity and profitability by improving sample throughput, reducing time for method and system maintenance, as well as reducing operator bias on data review.



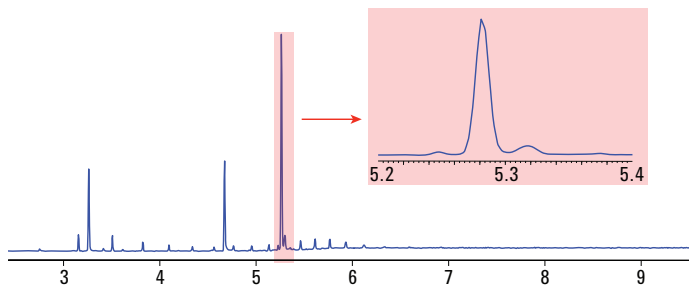
Retention Time (R.T.)	Cas #	Compound Names	Amount (ng)		AMDIS		NIST	
			Chemstation	AMDIS	Match	R.T. Diff	Reverse Match	Hit Number
3.2702	51799327	N-Propylamphetamine			99	-1.3	91	1
4.6881	3158858	10,11-Dihydrodibenz(b,f)(1,4)oxazepin-11-one			97	-0.7	90	1
5.2479	521379	Cannabidiol			68	5.6	64	3
5.281	1972083	Delta-9-tetrahydrocannabinol (THC)			95	0.5	85	1
5.283	125291	Hydrocodone			95	0.2	88	1
5.3145	466999	Hydromorphone			78	-0.1	67	2
5.3637	521357	Cannabinol			67	0.8	55	4

In less than 60 seconds, DRS accurately identified both THC and Hydrocodone.

Compound identification:

Probability-based matching (PBM) vs. Deconvolution Reporting Software (DRS)

When accuracy is critical and time precious, the choice is clear.

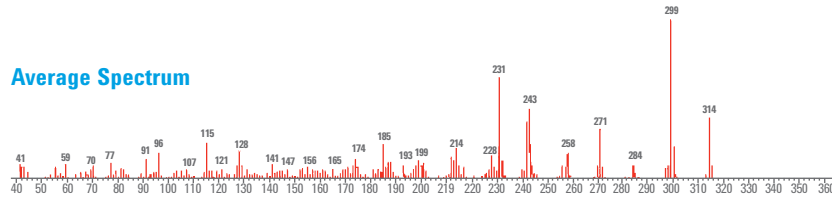


PBM Search Results: C:\DATABASE\FORCHEMCL

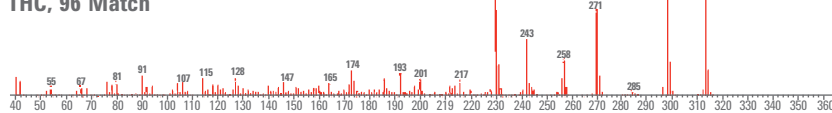
Rank	Name	Ref No.	MW	Qual
1	Delta-9 tetrahydrocannabinol (THC)	143	314	96
2	Hydrocodone	80	299	35
3	Codene	32	299	16

Buttons: Difference, Statistics, Text, Print, Done, Help

Average Spectrum

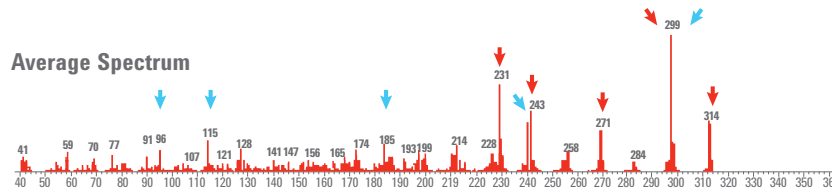


THC, 96 Match

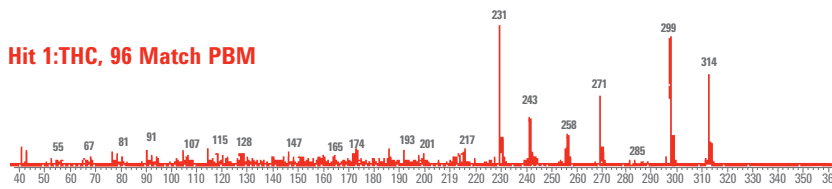


What compound elutes at 5.28 minutes? Probability-based matching identifies THC – but are you sure? The comparison below suggests a different answer.

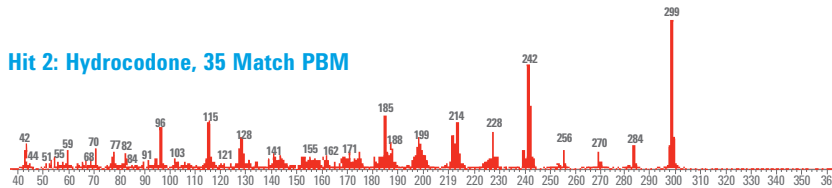
Average Spectrum



Hit 1: THC, 96 Match PBM



Hit 2: Hydrocodone, 35 Match PBM



PBM leaves you with uncertainty: This comparison of THC and Hydrocodone spectra against the collected spectrum reveals that the collected spectrum *doesn't quite match THC*.

Agilent has the technology and experience to support your lab with fully customized solutions

Our Analyzer solutions significantly reduce your time from system arrival to final validation. With pre-configured hardware and method-specific separation tools, your analysts can focus on calibration and validation per your laboratory's SOPs.



Agilent 5977A MS with the 7890B GC.

Put your lab on the productivity fast track.

Contact your local Agilent Representative
or Agilent Authorized Distributor at
agilent.com/chem/contactus

Or call **800-227-9770** (in the U.S. or Canada)

Visit agilent.com/chem/appkits
for a description of available Analyzers and Application Kits

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Beyond the box:

A full portfolio of customized products, advice, and support

High-quality columns and supplies from the world GC leader

Agilent-engineered GC columns and supplies deliver what your analysts demand – including:

- Long-term reliability and robustness
- Trouble-free instrument operation
- Faster analysis *without* loss of resolution

Best-in-class service and support – both on-site and remotely

Whether you need support for a single instrument or a large-scale, multi-vendor operation, Agilent service professionals can help you solve problems quickly and increase your uptime – so you can focus on what you do best.

Custom GC and GC/MS configurations

Let Agilent customize a standard GC or a GC/MS analyzer with specialized columns, valves, tubing inlets, and other add-ons – including an extensive line of consumables and column modules.

Ordering information:

Part Number	Analyzer Description
G3445B#472	Controlled Substance Analyzer - Helium Gas
G3445B#476	Controlled Substance Analyzer - Hydrogen Gas

* Both Analyzers easily convert between carrier gases *



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