

Safeguard Against Helium Uncertainty

Agilent HydroInert source for GC/MS with hydrogen carrier gas



What if You Could Use Hydrogen Carrier to Analyze More Compounds?

H₂



Although helium remains the preferred carrier gas, global helium shortages have reduced its availability—and increased its cost. These shortages jeopardize the operations of labs that depend on gas chromatography.

Hydrogen is a renewable, low-cost alternative for many GC/MS applications. But because it's not inert, hydrogen can sometimes cause reactions in certain analytes in the source, such as nitrobenzene conversion to aniline.

The Agilent HydroInert source addresses this problem and is ideal for labs that are considering hydrogen but are worried about analytical limitations. HydroInert allows you to:

- Prevent work stoppages caused by insufficient helium supplies
- Maximize your return on investment for hydrogen carrier gas
- Achieve faster, shorter separations
- Reduce sensitivity loss and spectral anomalies
- Minimize downtime caused by system maintenance and ion source cleaning

Use Hydrogen Carrier to Analyze More Compounds
New Agilent HydroInert source for GC/MS hydrogen carrier gas

Helium has long been the carrier gas of choice for GC and GC/MS analysis. However, global helium shortages have reduced the availability and increased the cost of helium gas, jeopardizing the operations of labs that depend on gas chromatography.

Hydrogen is a renewable, low-cost gas that is a viable alternative for many GC/MS applications. But because it is not inert, hydrogen does not work well with sensitive organic compounds (SOCs) like those described in this article, such as nitrobenzene. The new Agilent HydroInert source addresses this problem. It is designed to improve chromatographic efficiency with a hydrogen carrier allowing you to:

- Maximize your return on investment for hydrogen carrier gas
- Achieve faster, shorter separations
- Reduce sensitivity loss and spectral anomalies
- Minimize downtime caused by system maintenance and ion source cleaning

Analysis of nitrobenzene is improved when using HydroInert with hydrogen
These retention times correspond to the peaks in the chromatogram. The analysis of nitrobenzene with hydrogen carrier gas.

The chromatogram shows two traces: 'Helium carrier gas' and 'Hydrogen carrier gas'. The 'Helium carrier gas' trace shows a significant peak labeled 'High bleed causes the noise'. The 'Hydrogen carrier gas' trace shows a much cleaner baseline with a clear peak for nitrobenzene.

Agilent

To see the results of a nitrobenzene analysis using the HydroInert source, [download our flyer](#).

Is Hydrogen Carrier Gas Good for Your Lab Budget?

Using hydrogen as an alternate carrier gas minimizes the risk of downtime due to limited gas supplies. But, there are financial advantages as well. To see how the savings could add up, use this interactive worksheet.

Lower Operating Costs When Using Hydrogen

Cylinders of hydrogen cost considerably less than helium. Hydrogen can also be generated in the lab—further reducing carrier gas costs.

Cost of hydrogen per year	<input type="text"/>
Cost of helium per year	<input type="text"/>
Annual gas savings	<input type="text"/>

Productivity Gains From Faster Run Times (Method dependent)

Hydrogen carrier gas delivers faster analyses with the same separation quality as helium, so you can process more samples per day.

Not applicable

Revenue per sample	<input type="text"/>
Run time gain for hydrogen	<input type="text"/>
Samples with faster run time	<input type="text"/>
Annual savings from productivity gains	<input type="text"/>

Reduced Source Maintenance Impact (Labor)

The HydroInert source reduces ion source cleanings by up to 12 times—minimizing system downtime and maintenance.

Source cleaning time (hours)	<input type="text"/>
Labor costs per hour	<input type="text"/>
Original source cleanings per year	<input type="text"/>
Source cleanings with HydroInert per year	<input type="text"/>
Annual labor cost savings	<input type="text"/>

Productivity Gains From Less Cleaning

Fewer ion source cleanings mean fewer interruptions to data generation.

Revenue per sample	<input type="text"/>
Original source cleanings per year	<input type="text"/>
Source cleanings with HydroInert per year	<input type="text"/>
Samples per hour	<input type="text"/>
Source cleaning time (hours)	<input type="text"/>
Annual savings from productivity gains	<input type="text"/>

Total annual savings with HydroInert

Setup costs (First year only)

HydroInert source	<input type="text"/>
Hydrogen method development and validation per instrument	<input type="text"/>
New tubing, filters, and column	<input type="text"/>
Total setup costs	<input type="text"/>

Learn more about the HydroInert source and the benefits of alternate carrier gases.

More Than Just Cost-Effective— Sustainable, Too

Even the most efficient GC systems consume their share of energy, gas, and other resources. The Agilent HydrolInert source is just one innovation that is helping to change this equation.

Here are some other ways that partnering with Agilent can help your lab lower its energy and gas consumption.

Helium conservation module

This module bridges two electronic pneumatic control (EPC) channels to deliver a single carrier gas flow to your GC. That means you can use helium for your GC runs and switch to an alternate gas (such as nitrogen) when your GC is idle.

Electronic pneumatic control (EPC)

Agilent smart GC instruments feature core microchannel-based EPC, which protects against gas contaminants—such as particulates, water, and oils.

Direct column heating

The Agilent Intuvo 9000 GC uses an ultrafast and efficient direct heating system that requires less than half the electrical power of a conventional GC. It also significantly reduces the heat emitted back into the lab.

Conservation or conversion?

Ongoing helium shortages can cause unpredictability for GC analysts. Fortunately, there are ways to manage helium price fluctuations and delivery interruptions—and even use less gas.



Agilent Intuvo 9000 GC system

Agilent 8890 GC system

Supporting your success

CrossLab is an Agilent capability that integrates services and consumables to support workflow success, improve productivity, and enhance operational efficiency. In every interaction, we strive to provide insight that helps you achieve your goals. We offer a wide range of products and services—from method optimization and training to full-lab relocations and operations analytics—to help you manage your instruments and your lab for best performance.

Learn more about Agilent CrossLab, and see examples of insight that leads to great outcomes, at www.agilent.com/crosslab



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