

# Chromatography Corner

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## upcoming events

- **June 23-27:** ASTM  
 Where: Montreal, Canada
- **July 23-26:** 13th China International Environmental Protection Exhibition & Conference  
 Where: Beijing, China
- **July 26-28:** XiAn International Petroleum Petrochemical Natural Gas Technology Equipment Exhibition  
 Where: Xi An, China

For more information visit:

[www.wasson-ece.com](http://www.wasson-ece.com)  
 or call (970)221-9179

## Detailed Hydrocarbon Analysis (DHA) per ASTM D6730 and Fast DHA

Petroleum products often have complex compositions consisting of many different quantities and types of hydrocarbons. Knowing the hydrocarbon content of a crude product can aid in making decisions during hydrocarbon processing that can help increase profitability, maximize efficiency, and comply with federal environmental regulations. Detailed hydrocarbon analysis quantifies and identifies all of the individual hydrocarbon components in a petroleum product.

The American Society for Testing and Materials (ASTM) has developed method D6730 for the Determination of Individual Components in Spark Ignition Engine Fuels. Environmental regulatory bodies frequently require the use of ASTM D6730 for detailed hydrocarbon analysis. The standard run time for ASTM D6730 is 175 minutes.

For processors who wish to use detailed hydrocarbon analysis to make production decisions and are not required to comply with ASTM D6730, 175 minutes is a long run time and can limit production. In order to meet the needs of processors wishing to make expedient production decisions, Wasson-ECE Instrumentation has configured a 30 minute fast detailed hydrocarbon analysis. Wasson-ECE expedited the run time by using an alternate column and hydrogen carrier gas. To reduce costs of purchasing and maintaining multiple instruments but provide maximum flexibility for hydrocarbon analysis and processing, Wasson-ECE has configured a single gas chromatograph to analyze both the standard ASTM D6730 detailed hydrocarbon analysis and the 30 minute fast detailed hydrocarbon analysis.

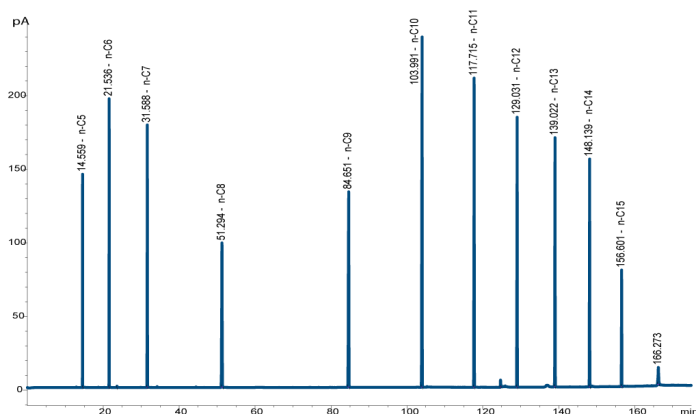


Figure 1. D6730 Analysis

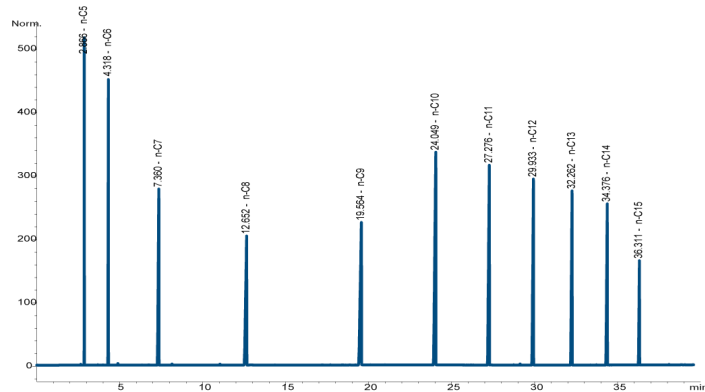


Figure 2. Fast DHA Analysis



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 INSTRUMENTATION

Engineered Solutions, Guaranteed Results.

## Introducing the Automated Sample Cylinder Cleaner

Reliable results start with sample preparation. In order to obtain analytical data that can be trusted, good laboratory practices must be utilized from sample collection through calculation and data processing. Techniques like cleanliness, reagent quality, and sample storage conditions are often easily overlooked. Inadequate attention to any part of the process can negatively affect the caliber of the resulting data.

Automation reduces time-consuming, repetitive tasks involved in sample preparation. Using mechanical methods to automate and perform simple cleaning and prep work saves labor for more substantial tasks while maintaining good laboratory practices. Automation also ensures that the job is done consistently and thoroughly.

Wasson-ECE Instrumentation has developed an automated sample cylinder cleaner to reduce repetitive laboratory tasks, improve consistency in the cleaning process, and improve sampling integrity.

The Wasson-ECE Steam Cleaner is a complete cylinder cleaning solution. Sample cylinders can be cleaned in multiple configurations and methods, all configurable by the user without requiring any knowledge of programming, hardware or valve control. With its simple touch screen display and cylinder grid, configuration and operation settings are easily accessible and adaptable to the user's operating method and style.

Whether you sample with ten sample cylinders or thousands, the Wasson-ECE Steam Cleaner automates the process of repeatedly steaming and flushing sample cylinders to remove hydrocarbon residue. The Steam Cleaner accepts twelve 300cc cylinders for purging and evacuation.

The cylinders are mounted up-right into a common manifold and the controller automatically sequences between pressurization and evacuation to remove any contaminants from a prior sample, including any residual water. Only the lower valve is connected to the manifold to apply the steam in a charge-and-evacuate method, not blow through to obtain a more thorough cleaning. With Wasson-ECE's Steam Cleaner, sample bombs will be cleaned quickly and correctly every time.

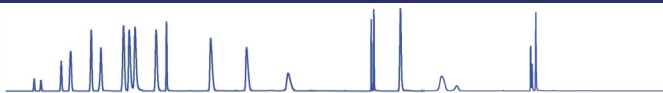


## Chromatography Tips and Tricks

There are many different gases that can and have been successfully used as a carrier gas for gas chromatography. Each gas has its unique advantages and disadvantages. To be effective for use as a carrier gas, the gas must not react with the sample or with the stationary phase. Carrier gas must be of a high purity to avoid column contamination and interferences. If a gas meets these basic requirements it can be used as a carrier gas, but characteristics unique to each gas will affect the quality and speed of chromatography.

Helium is used in the majority of GC applications because it is inert, non-explosive, and provides high quality separation within a reasonable analysis time. As the availability of helium is increasingly limited and costs continue to rise many chromatographers are looking for viable alternatives. Pulse discharge helium ionization detectors require helium for operation but most other detectors can operate successfully using hydrogen or nitrogen as an affordable alternative carrier gas.

Hydrogen has a light molecular weight, a high degree of diffusivity, and low viscosity leading to faster chromatography. The use of hydrogen instead of helium can reduce analysis times by more than half. Hydrogen maintains a similar degree of separation and resolution over a wide range of linear velocities. Safety is the primary concern when switching to hydrogen. Reaching explosive levels of 4% hydrogen is unlikely because newer



instruments have less heating power and larger heating filaments.

Nitrogen can be generated from room air and there are large available cheap sources or it. Nitrogen is non-explosive and does not create a safety hazard. Nitrogen is very inert and does not exhibit any known stationary phase, matrix, or analyte

reactions. According to Van Deemter's theories, nitrogen's high viscosity and low diffusivity could cause sensitivity and resolution to be negatively affected. However Van Deemter's plots are purely theoretical, in practice Wasson-ECE and other chromatographers have had success with nitrogen carrier gas in creating chromatograms equivalent to those created using helium carrier gas.

Additional questions? Contact our marketing department at (970) 221-9179 or [marketing@wasson-ece.com](mailto:marketing@wasson-ece.com) for the comprehensive "Selecting a Carrier Gas" application note.



## Wasson-ECE Instrumentation News

### Wasson-ECE Expands Virtual Application Notes

Wasson-ECE has recently updated our website to include new application notes that highlight analyzer descriptions, chromatography examples, key features and benefits, and additional literature references.

Some of the most recent application notes include:

- Analysis of Alkanolamines in LPG
- Analysis of Arsine and Phosphine in Ethylene and Propylene
- Diisopropyl benzene analysis

Is there an application you would like to learn more about or see on the website? Email [sales@wasson-ece.com](mailto:sales@wasson-ece.com) or call (970) 221-9179.



## Events Calendar



### Wasson-ECE Instrumentation

specializes in configuring and modifying new or existing Agilent Technologies gas chromatographs. Our systems are guaranteed, turn-key analytical solutions, with the installation, warranty and service plan on us. Contact us for your custom GC analysis needs and find out what a difference over 20 years of experience can make.

**June 23rd-27th:** ASTM Annual Meeting in Montreal, Canada

**July 23rd - 26th :** 13th China International Environmental Protection Exhibition & Conference (CIEPEC), Booth No. Hall 1-B812, Beijing, China

**July 26th - 28th :** XiAn International Petroleum Petrochemical Natural Gas Technology Equipment Exhibition, Booth No. B201, Xi An, China

**September 22nd - 24th :** China Chemical & Petrochemical Test & Experimental Apparatus and Equipment Exhibition, Booth No. D2, Nanjing, China

**October 15th-16th:** Gulf Coast Conference, Galveston, TX

**March 2014:** Pittcon, Chicago, IL

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