Quarterly Newsletter From Wasson-ECE Instrumentation:

Chromatography Corner

ISSUE 25 April 2011

this issue

upcoming events

- **May 25:** Free 383DS Webinar
  Time: 9:00 am MST
- **July 27:** Free 383DHO Webinar
  Time: 9:00 am MST

To register for one of Wasson-ECE's webinars visit:
www.wasson-ece.com/events
or call (970)221-9179

Introducing the 383DS Super Refinery Gas Analyzer

Introducing the newest GC application for refinery gas analysis, the 383DS from Wasson-ECE. The 383DS utilizes two Wasson-ECE thermal conductivity detectors (TCD/TCD) and two flame ionization detectors (FID/FID) as well as the Wasson-ECE auxiliary oven for a versatile and comprehensive refinery gas analysis.

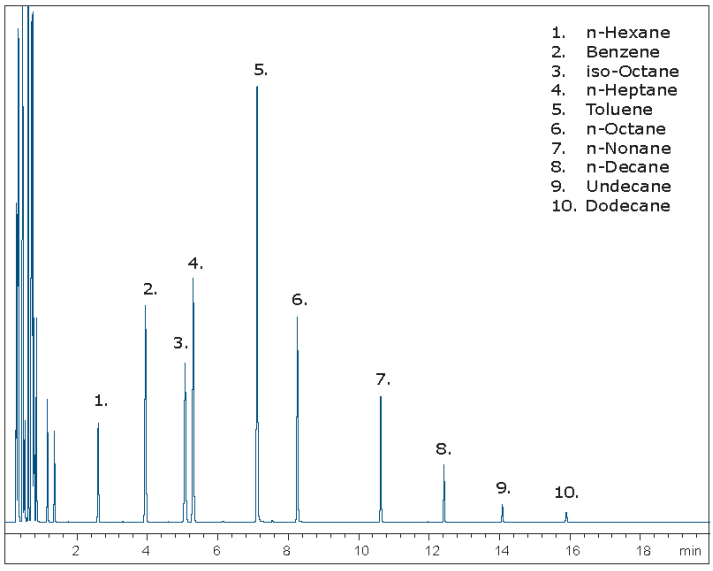
Typical refinery gas analyzers are configured with dual TCDs and a single FID for the analysis of permanent gases, hydrogen and hydrocarbons through benzene. However, with the new 383DS, a second FID provides the ability to also analyze low level CO/CO2, oxygenates, BTEX, or heavier hydrocarbons. Every system is specially engineered to the customer's specific sample needs.

The additional capabilities of the 383DS increase throughput and decrease the amount of instrumentation needed in the laboratory.

The 383DS total refinery gas analyzer utilizes the multiple valve and column positions available in the Wasson-ECE auxiliary oven, in addition to the valves and columns housed in the programmable oven.

Additional analyses preformed by the second FID include:

- Heavy hydrocarbons
- Oxygenates
- Low level CO/CO_2 in conjunction with a methanizer
- BTEX



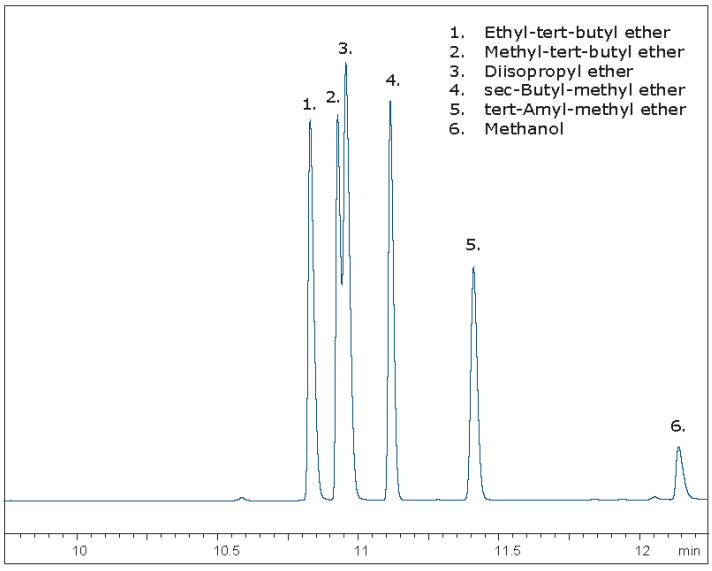


Figure 1 and 2: Possible FID2 simultaneous analyses for heavier hydrocarbons and oxygenates at ppm levels.

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Engineered Solutions, Guaranteed Results.

Automating Laboratory Hardware for Silane Analysis

Laboratory procedures for sample handling and chemical synthesis may require many different types of hardware to work in conjunction with one another. When the chemicals being manipulated are also pyrophoric and toxic such as silane (SiH_4), it becomes critical to ensure that procedures are followed correctly and with as little human exposure as possible.

The Automator, developed by Wasson-ECE Instrumentation, is a stand-alone automation controller which removes the potential for human error and eliminates the need to closely monitor processes.

Hardware components can be plugged into the back of the Automator and controlled according to a predefined method. Prior to the development of the Automator, expensive software and a deep understanding of programming languages was necessary to accomplish the same tasks.

Methods are easily configured using the intuitive method design wizard, reducing development time from days to minutes. Complete control over the hardware can be obtained by setting flows, temperatures, and voltages according to timed or logical events. The method and corresponding hardware configuration can then be saved for later use.

For the analysis of silane, the Automator was first used to control the pressure of the sampling system and ensure no air was allowed to enter the system. Introducing air to silane creates abrasive silicon oxide deposits which would damage sensitive hardware components. Additional methods were programmed to alternate between calibration blends and silane sources using pneumatic valves.

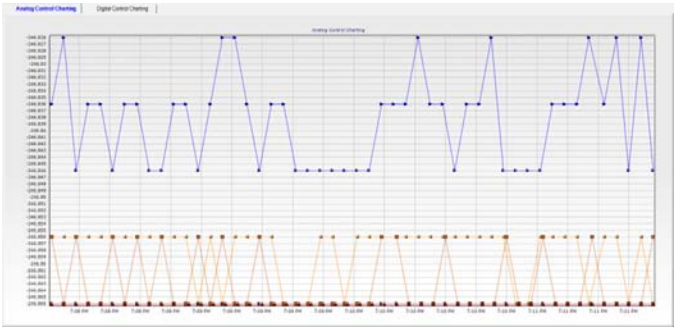


Figure 3: Real-time data tracking using the Automator and AutoVision software.

Figure 4: Front view of the Automator touch screen

The Automator is capable of controlling almost any type of laboratory hardware including valves, motors, pumps, heaters, and alarms.

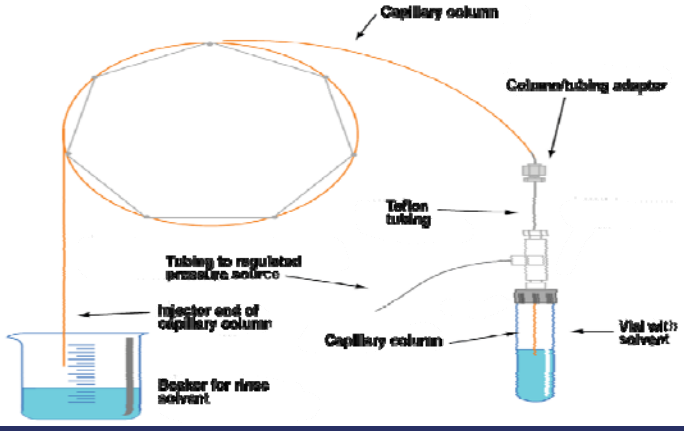
Product Features:

- Fully configurable digital and analog I/O
- Proportional integral derivative (PID) control
- Standalone controller with configurable IP address
- Temperature, pressure, flow and voltage control
- Hardware state editor with runtime event table
- Touch screen controller interface
- Four configurable PID loops
- 24 digital I/O, expandable to 55 digital I/O
- 16 channels of 16-bit A/D
- Four channels of 12-bit D/A
- Client software accessible from internet
- No additional software needed
- Operating system independent
- Real-time data tracking

Chromatography Tips and Tricks

When column contamination cannot be removed by baking out or trimming the column it may be necessary to solvent rinse the column. Any stubborn residues that are soluble in the solvent are washed from the column. Injecting large volumes of solvent while the column is still installed does not rinse a column nor does it remove contaminants. **Warning: A capillary GC column must have a bonded and cross-linked stationary phase before it can be solvent rinsed. Rinsing a non-bonded stationary phase results in severe damage to the column.**

Multiple solvents are normally used to rinse a column. Each successive solvent must be miscible with the previous one. High boiling point solvents should be avoided especially as the last solvent rinse. A good choice for the first rinse is the sample matrix. A series of solvents that works well in the majority of cases is methanol, followed by methylene chloride, and ending with hexane. Acetone can be substituted for methylene chloride to avoid using a halogenated solvent.



If samples are aqueous based, such as biological fluids and tissues use water prior to the first methanol rinse.

The table below suggests solvent volumes for different diameter columns. Using larger solvent volumes is not harmful, but rarely beneficial. After adding the first solvent, pressurize the solvent through the column, but stay below 20 psi. Use the highest pressure that keeps the solvent flow rate below 1 mL/min. Longer rinse times are required when using heavy or viscous solvents, and for longer or smaller diameter columns. When most of the first solvent has entered the column, add the next solvent. The previous solvent does not have to vacate the column completely before the next solvent is started. After the last solvent has left the column, allow the pressurizing gas to flow through for 5-10 minutes. Install the column into the injector, and turn on the carrier gas. Allow the carrier gas to flow through the column for an additional 5-10 minutes. Attach the column to the detector and using a temperature program starting at 40-50°C, heat the column at 2-3°/min until the upper temperature limit of the column is reached. Maintain the upper temperature limit for 1-4 hours until the column is fully conditioned.

Column I.D. (mm)	Solvent Volume (mL)*
0.18-0.2	3-4
0.25	4-5
0.32	6-7
0.45	7-8
0.53	10-12
*Using larger volumes will not damage the column.	

Additional questions? Contact our service department at (970)221-9179 or service@wasson-ece.com.

Wasson-ECE Instrumentation News

Wasson-ECE Basic GC Training on the Road!

Wasson-ECE will be taking our 2-day Basic GC Course on the road. See below for scheduled dates and cities.

September 14-15: Houston, TX
October 12-13: Anacortes, WA

Cost: $1000 per participant

Sign-up at www.wasson-ece.com and click on the Education Center or call (970) 221-9179.

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.

Events Calendar

May 25: Free 383DS Super RGA Webinar
July 27: Free 383DHO RGA plus Oxygenates Analysis Webinar
September 14-15: Basic GC 2-Day Course in Houston TX
September 28: Free Automator Webinar
October 12-13: Basic GC 2-Day Course in Anacortes, WA
November 30: Free Environmental Products Webinar

Want a custom training course for your company? Need training at your site? Contact Wasson-ECE for your quote today at training@wasson-ece.com or call (970)221-9179.

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