

GC Volatiles Systems

System VOC



Principal Applications

- USEPA Methods 502.2, 503.1, 601, 602, 8010, and 8021
- ISO 15009 and 15680
- Standard Methods 6200C
- Halocarbons
- Aromatics, olefins
- Solvents
- Hazardous wastes

System VPH and System BTEX

Principal Applications

- Massachusetts Volatile Petroleum Hydrocarbon (VPH) method
- Benzene, toluene, ethylbenzene, xylenes, and other aromatics (BTEX)
- USEPA Methods 602, 8015, and 8020
- GRO and DRO
- Leaking underground storage tank monitoring
- Fuel spills in soils
- Combined total leachate program
- Fuels in water (wastewater)
- ISO 15009 and 15680
- Standard Methods 6200C



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A World of Solutions



CE



High-Performance Systems for Detecting Volatile Organic Compounds by Purge and Trap/GC

The System VOC is a fully integrated, high-performance GC system available from OI Analytical for analyzing volatile organic compounds (VOCs) in water and soil. This complete state-of-the-art system extracts VOCs from a representative sample, chromatographically separates, and selectively detects target compounds following specific regulatory methods. Available as a turn-key system from a single vendor, the System VOC includes the new OI Analytical Model 4660 Eclipse Purge-and-Trap Sample Concentrator, Low-Dead-Volume Injector, Agilent® Technologies 6890 GC, column, and choice of optional autosamplers. The System VOC is configured with a tandem PID/ELCD for analyzing halogenated and aromatic species found in USEPA Methods 601/602 and 502.2. Many regulatory methods specify using PID/ELCD tandem detectors for VOC analysis. Systems delivered in the U.S. also include installation and setup.

Operating Principles

The Eclipse Sample Concentrator exhaustively extracts VOCs from the sample, concentrates them on a solid adsorbent bed, and thermally desorbs them onto the GC column. Chromatographic separations are performed on a capillary column for complete resolution of all compounds, including the gases, without subambient temperature programming or cryo-focusing. A tandem PID/ELCD selectively detects, identifies, and quantifies compounds specified in USEPA methods. Systems incorporating mass spectrometers are also available for analysis using USEPA Methods 524.2, 624, and 8260.

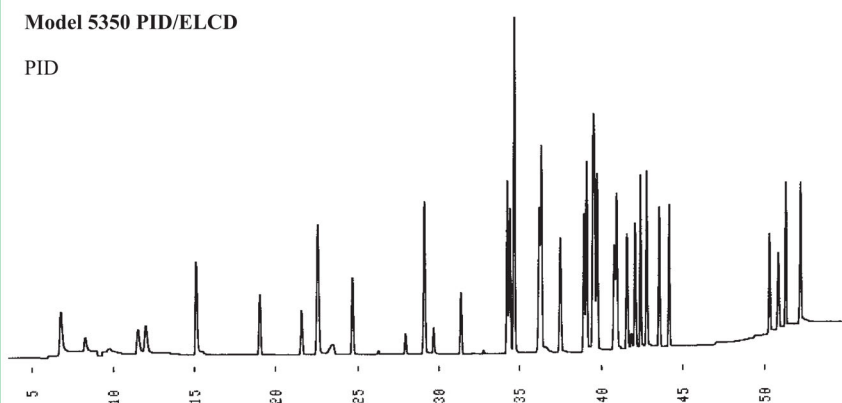
- Preconfigured packages include all necessary hardware for analysis: OI Analytical Eclipse Purge-and-Trap Sample Concentrator, Model 5350 Tandem PID/ELCD, Agilent GC, columns, and standards
- Integrated systems emphasize ease of use and accuracy of results
- All systems include an appropriate GC capillary column
- Eclipse Sample Concentrator provides built-in patented Cyclone Water Management™, rapid trap heating and cooling, and unique protective sparge filter design. Many productivity enhancement options are available
- Eclipse Sample Concentrator and autosamplers provide the fastest overall cycle time in the industry, maximizing your laboratory's productivity
- Tandem PID/ELCD requires only one detector port
- Third-generation ELCD features rapid-release reactor design and quick-change, nickel-tube disposable resin cartridges

System VOC

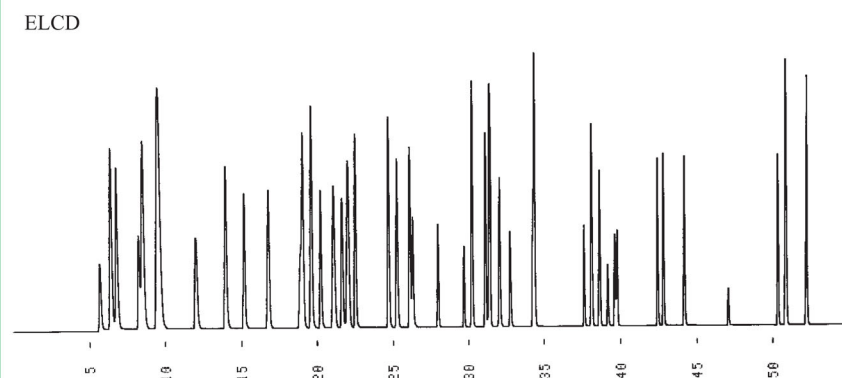
Standard: 5 mL of USEPA Method 502.2 mix (5 ppb)
Column: Rtx-502.2 105 m x 0.53-mm I.D. x 3.0- μ m film
Trap: OI Analytical #9 (Tenax®/silica/charcoal)
Detector: OI Analytical Tandem PID/ELCD
For more information, see OI Analytical application note 1412.

Model 5350 PID/ELCD

PID



ELCD



GC Systems for Volatile Petroleum Hydrocarbons (VPH) and Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) Analysis

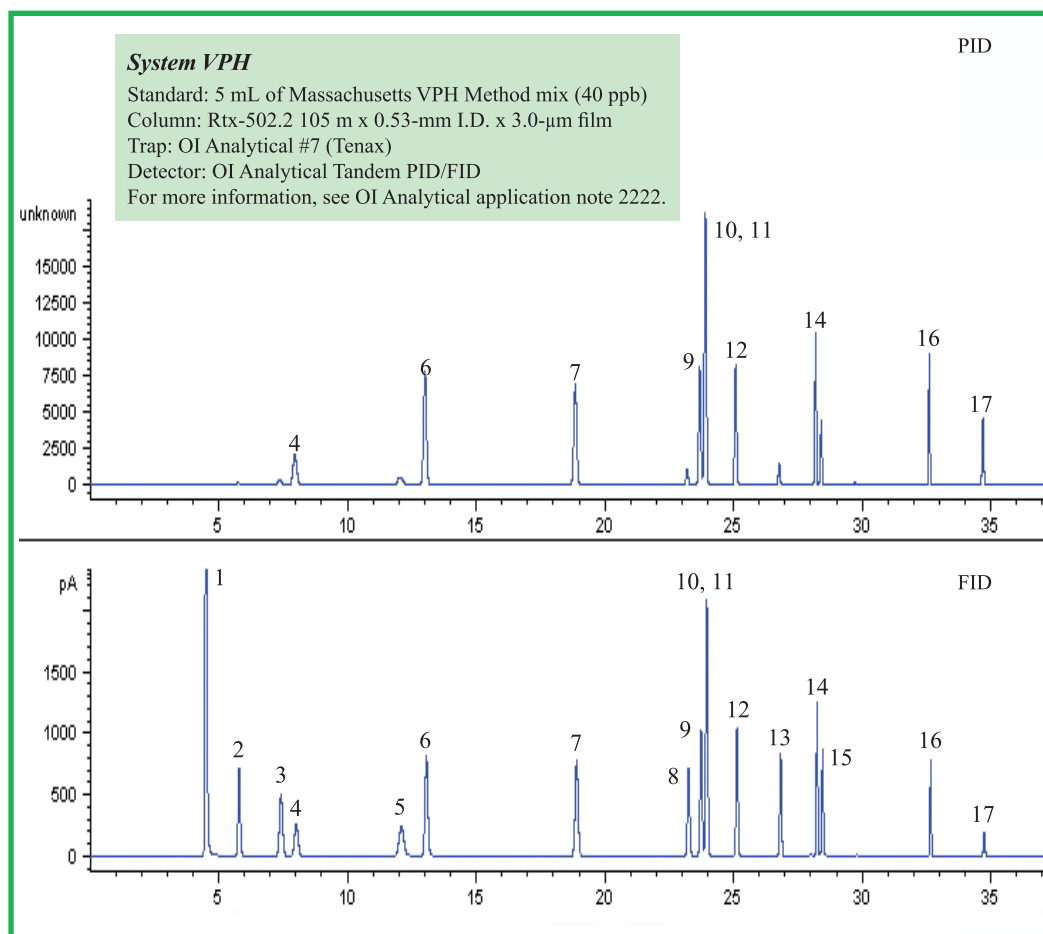
The System VPH is a complete package tailored to measure aromatic and aliphatic hydrocarbons in environmental samples using the Massachusetts VPH and similar methods. This affordable system can also be customized for analyzing BTEX and other aromatic compounds, volatile gasoline range organics (GRO), and volatile diesel range organics (DRO).

The System VPH and System BTEX are identical to the System VOC but is customized for analyzing aromatics and aliphatics by using the reasonably-priced tandem PID/FID detector combination. The PID and FID detectors installed in series using OI Analytical's patented tandem configuration generate simultaneous aliphatic and aromatic chromatograms in a single analysis. The PID/FID is the required detector for many regulatory methods such as USEPA Method 8015, Massachusetts VPH, and many GRO methods. Like the System VOC, many methods in use in the world specify PID/FID tandem detectors for VOC methods.

Purge-and-Trap Autosamplers

OI Analytical offers a full range of autosamplers for use with the System VOC, System VPH, and System BTEX including the Model 4551A Water Autosampler, Model 4552 Water/Soil Autosampler, and AMPS six-port, on-line, continuous multipoint sampler.

- Standard system package includes all necessary hardware for analysis: Eclipse Purge-and-Trap Sample Concentrator, Model 4450 Tandem PID/FID, Agilent GC, appropriate columns, and standards
- System VPH includes the capillary column specified in the Massachusetts VPH method
- Tandem PID/FID provides excellent sensitivity and linearity, while eliminating interconnecting transfer lines
- PID hidden-window design prevents lamp fouling
- Third detector capability
- Systems are available for customized requirements or other related methods such as BTEX, GRO, and DRO
- On-line, automated, multipoint water monitoring system is also available
- Automated pH measurement provides confirmation of proper preservation technique



1.	Methanol
2.	<i>n</i> -Pentane
3.	2-Methylpentane
4.	Methyl- <i>tert</i> -butyl ether (MTBE)
5.	2,2,4-Trimethylpentane
6.	Benzene
7.	Toluene
8.	<i>n</i> -Nonane
9.	Ethylbenzene
10.	<i>m/p</i> -Xylene
11.	
12.	<i>o</i> -Xylene
13.	<i>n</i> -Decane
14.	1,2,4-Trimethylbenzene
16.	Naphthalene
17.	2,5-Dibromotoluene

General Specifications

Standard System VOC Hardware

- Eclipse Purge-and-Trap Sample Concentrator
- Model 5350 Tandem PID/ELCD System
- Agilent GC
- OI Analytical low-dead-volume injector

Performance Specifications

Trap

- >1,000 °C/minute heating rate to 300 °C; 450 °C maximum
- >240 °C/minute cooling rate (200 °C to 30 °C in <50 sec)

Water Management

- Eliminates all but ~0.25 µL (0.063 µL/minute) of trapped desorb water (>96% water removed)
- Operates at *ambient* temperature
- Water removal at level equivalent to condensation at 4.8 °C

ELCD

Minimum Detectable Mass

- Halogen: 1 pg lindane

Maximum Detectable Mass

- Halogen: 5 µg lindane

PID

Dynamic Range

- Greater than 10⁶

Sensitivity

- <40 picograms benzene

Communication Interface

- Ethernet/LAN connection to the sample concentrator

Detector Output

- 1V full-scale analog voltage

Requirements

Power Requirements

- 115 VAC (±10%), 60 Hz
- 230 VAC (±10%), 50 Hz

Benchspace Requirements

- 105.4 linear cm (41.5 inches) for total basic system

Gas Requirements

- Ultrahigh purity H₂, and He (99.999% purity or better)

Options

- Choice of three autosamplers including multipoint sampling for homeland defense applications
- Foam Buster™, Foam Sensor™, Sparge Overfill Sensor™, Infra-Sparge™ Sample Heater
- pH Express™ for automated pH measurement
- Choice of capillary GC columns
- Extended warranties and training
- Eclipse Sample Concentrator supports international languages, as well as English

General Specifications

Standard System VPH and System BTEX Hardware

- Eclipse Purge-and-Trap Sample Concentrator
- Model 4450 Tandem PID/FID detector system
- Agilent GC
- OI Analytical low-dead-volume injector or Agilent split/splitless injector
- Method-appropriate GC capillary column

Performance Specifications

Minimum Detectable Mass

PID

- <40 pg benzene

FID

- 5 pg carbon/second propane

Dynamic Range

PID

- >10⁶

FID

- ±10% over a 10⁶ range

Communications Interface

- Ethernet/LAN connection to the sample concentrator and GC

Detector Output

- 1V full-scale analog voltage

Requirements

Power Requirements

- 110 VAC (±10%), 60 Hz
- 220 VAC (±10%), 50 Hz

Benchspace Requirements

- 109.2 linear cm (43 inches) for a standard system

Gas Requirements

- Ultrahigh purity H₂, and He (99.999% purity or better)

Options

- Choice of three autosamplers including multipoint sampling for homeland defense applications
- Foam Buster™, Foam Sensor™, Sparge Overfill Sensor™, Infra-Sparge™ Sample Heater
- pH Express™ for automated pH measurement
- Choice of capillary GC columns
- Extended warranties and training
- Eclipse Sample Concentrator supports international languages, as well as English

Several factors including GC, column, electrolyte, and compound class can affect performance.

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