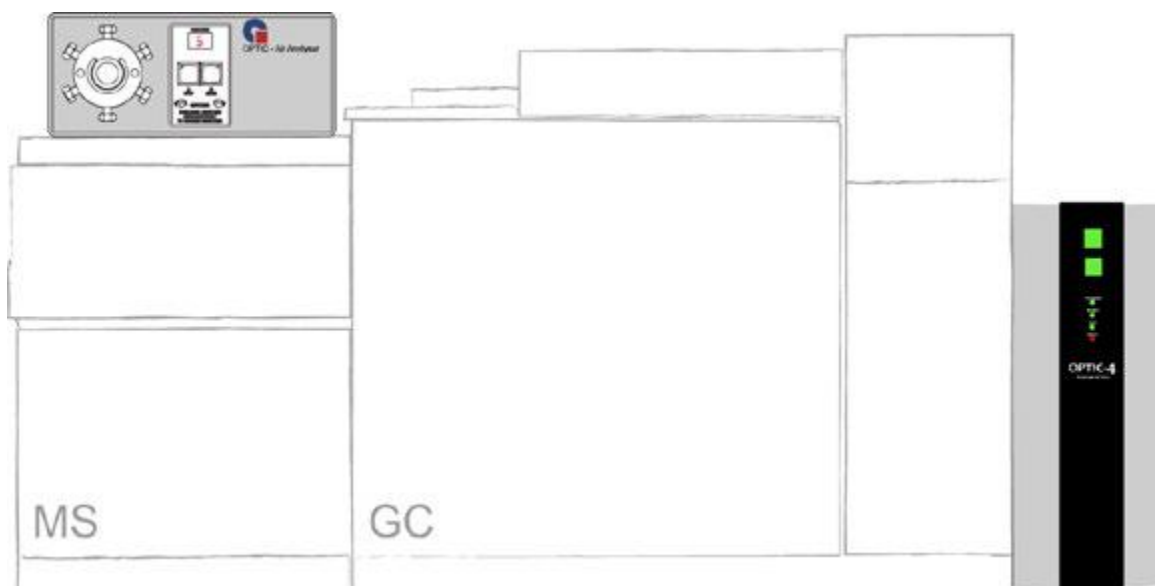


OPTIC-Air-Analyser

GC-MS Air Analyser for the Determination of very low Concentrations of VOCs in Air



Selection Valve (option)

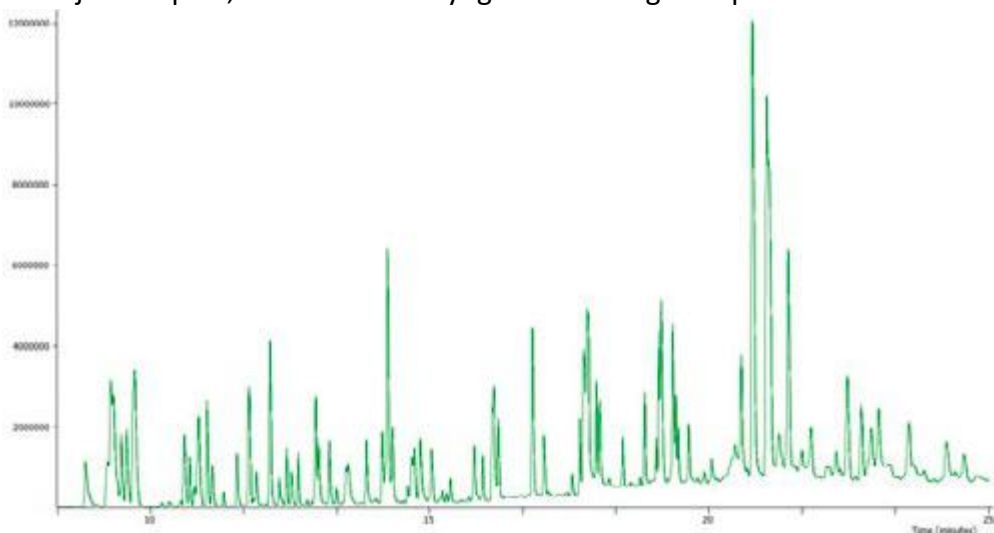
The OPTIC-Air-Analyser can be supplied with an 8 port selection valve as an option. Standard the system has one inlet tube that can be connected to a sample like a sample bag, climate chamber, Air pipe of a mobile lab or canister.

The optional 8 port selection valve can be controlled manually or by software so the sample can be selected automatically.

Application

A home-made mixture of 63 compounds (comparable to the TO-17 mixture) is used for evaluation of the OPTIC-Air-Analyser. Sampling was done during three minutes at 75 ml/min (total sample volume = 225 ml).

The resulting chromatogram starts with n-Propane and ends with Naphthalene. Since the sample trap is in the injection port, no additional cryogenic focusing is required at the head of the capillary column.



TIC chromatogram (scan) of a 63 compound mixture at 25 µg/m³.

List of compounds:

Propane	Ethane, 1,2-dichloro-	o-Xylene
Ethene, chloro-	Methyl t-butyl ether (MTBE)	Benzene, 1,3-dichloro-
Ethanol	1-Butanol	Nonane
Isobutane	Benzene	Benzene, 1,3,5-trimethyl
1,3-butadiene	Ethane, 1,1,1-trichloro-	Benzene, 1,3,5-trimethyl
1-Butyne	Cyclopentane, methyl-	Benzene, 1,2-dichloro-
Butane	n-Hexane	Benzene, 1,4-dichloro-
Methylene chloride	Carbon Tetrachloride	Benzene, 1,2,4-trimethyl-
Propenenitrile	Trichloroethylene	Indane
Isopropyl Alcohol	Cyclohexane	Decane
Carbon disulfide	Propane, 1,1-dichloro-	Decaline
Dimethyl sulfide	Ethyl tert-butyl ether (ETBE)	Benzyl methyl ketone
Ethene, 1,1-dichloro-	Propane, 1,2-dichloro-	Benzene, 1,2,4-trichloro-
1-Propanol	Ethane, 1,1,2-trichloro-	Naphthalene
trans-1,2-Dichloroethylene	Propane, 1,3-dichloro-	Undecane
Diethyl ether	Heptane	
Isoprene	Toluene	
Pentane	Tetrachloroethylene	
cis-1,2-Dichloroethylene	Benzene, chloro-	
Ethane, 1,1-dichloro-	Bromoform	
Butanone	4-Vinyl-1-cyclohexene	
Trichloromethane	Octane	
Tetrahydrofuran	Ethylbenzene	
2-Butanol	m,p-Xylene	

Automated Air Sampling and Analysis

The OPTIC-Air-Analyser has been developed for the automated, in situ, determination of airborne volatile organic compounds (VOCs) using the OPTIC inlet from a sorbent tube trap. A sorbent tube placed as an injection port liner can be repeatedly used to collect samples of air, with the trapped analytes being subsequently desorbed onto a capillary gas chromatography (GC) column without the use of intermediate cryogenic refocusing. The system does not need any liquid nitrogen or CO₂, there is no need for adsorption/desorption tubes.

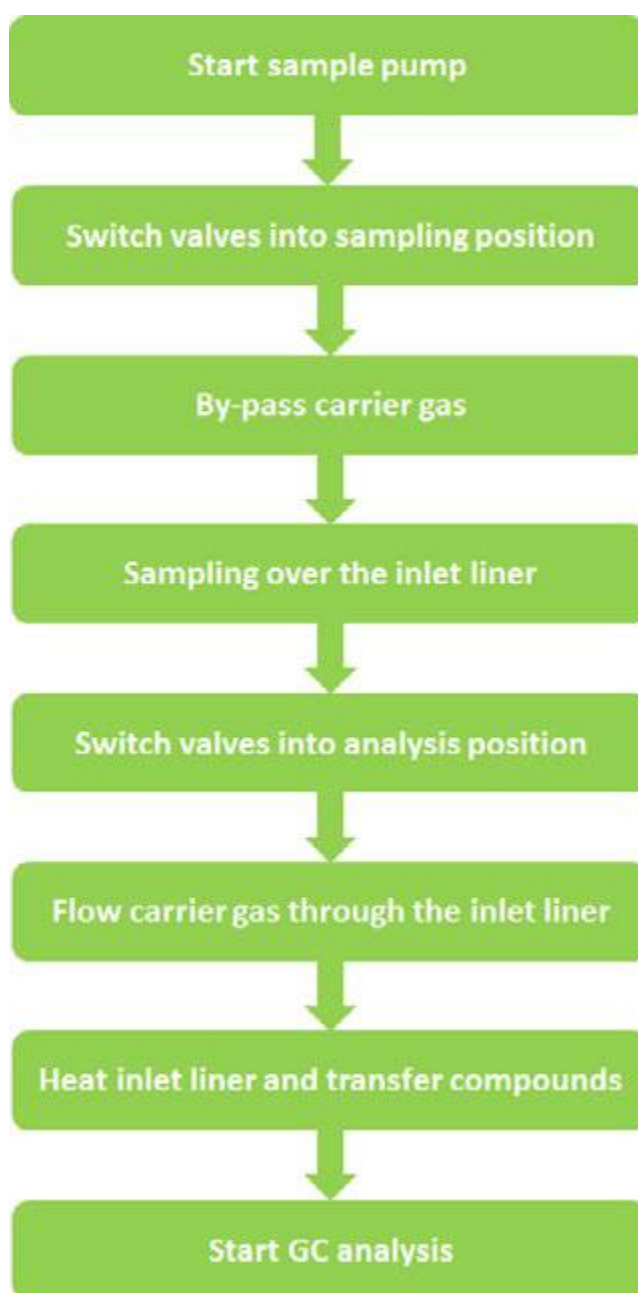
It is possible to set a continuous run so that for on-line analysis the system can run 24 – 7.

Operation

Using a multi positioning valve (option), the system can select between standards from, e.g., a Tedlar® bag or taking sample directly from the outside via, e.g., a probe on the roof of a mobile lab. Via a smart flow system, a sample is pumped through the injector port liner containing a suitable trapping material in reverse flow from bottom to top trapping the analytes, while the carrier gas is rerouted to the GC capillary column by-passing the injector port. Sampling is done during a fixed time with a constant flow controlled with a mass flow controller. The system is made so that it can be used without the use of additional coolant as liquid nitrogen or CO₂.

Once the sampling period is finished, the carrier gas flow via the injector port is re-established.

Following this, the injection port is heated to desorb the analytes from the injection port liner for transfer to the GC capillary column. In parallel with heating the injection port liner, the GC-MS analysis is started.



Strong points

- An analyser for in situ Analysis of VOCs in Urban Air has been demonstrated
- Air samples are automatically enriched on a sorbent tube in the OPTIC inlet and subsequently analysed by GC-MS
- No need for LN 2 or CO 2 as trapping coolant
- Instrument Detection Limit (IDL) is for the majority of the compounds in the range of 10 – 100 ng/m³
- Can work with any GC-MS
- On-line solution
- Automatically analyse up to 8 sample bags or canisters (with the optional selection valve)

What is supplied

The OPTIC-Air-Analyser consist out of:

- Special OPTIC-4 MultiMode Inlet.
- Valves and pump for sampling in a sophisticated housing
- GC column
- 3 days installation and training

Optional:

- 8 port selection valve with software and manual operation

Installation and training is done by [ChromaVision](#).

Contact

GL Sciences B.V. | Tel. +31 (0)40 2549531 | info@glsciences.eu | www.glsciences.eu