

EXPERTS IN GAS ANALYSIS

ONLINE ODORS MONITORING IN WASTE WATER TREATMENT PLANTS

Odors are very distinct air contaminants as they generate nuisances (see note at the end). The factors playing a role in the determination of odor annoyance are: odor concentration and intensity, frequency, appreciation, duration, synergy and location. Chromatotec® proposes an automated solution to well identify the origin and the level of odors.

Technology Description

We offer a comprehensive solution for odor monitoring, including:

Odors analyzers:

- *MEDOR Gas chromatograph specific for sulfur compounds*

- H2S/ MM/EM/DES/DMS/ DMDS/PM/SO2
- According to ISO6326/2 & DIN51855/7

ASTM D 7493-08

- Low detection limit < 1ppb for H2S, Mercaptans and Sulfides
- Interference free
- Detector lifetime: up to 10 years

More than 20 years' experience of odor measurement in waste water treatment plant

- *chromaTID gas chromatograph specific for amines and ammonia*

- *DET NH3 FTUV detector for ammonia*

Data Acquisition and transmissions:

GPRS/ModBUS/4-20 mA/0-1V

Internal auto calibration to validate automatically the data

Option: Data Reporting and modeling Software

*Real Time Odor Dispersion Modeling
Online Registration of Complains
Recalculation of Odor Concentration at Specific Location & Time*

Option multi stream (2 to 12 streams with 1 analyzer)

Option: meteorological Station: wind direction and speed, temperature, relative humidity.

Our solution

The instrument monitors ambient odors inside and outside waste water treatment plant and monitors also the deodorization process. One instrument, using a multi stream selector is able to measure compound concentrations and odor indexes before and after deodorization tower. These measurements allow the control and the adjustment of deodorization processes, the optimization of chemical treatment and to decrease effective costs.

As the replacement of calibration gas cylinders is expensive and time consuming, Chromatotec® is developing electrochemical gas generators (e.g. H2S, Cl2, O2, H2...). These generators will allow high level calibration and improve the and reliability of the system. ■ ■ ■



Waste water plant treatment

Note

In a Human being:

- 1 gene to hear
- 3 genes to see
- 12 genes to taste
- Close to 1000 genes to smell
- Scientists recently found that a human nose can discern up to a trillion (1000 billiards) of different scents
- Human Nose Odor threshold for H2S and Ethyl-Mercaptan is 0,5 ppb.

airmoTWA: NEW EXPERT SYSTEM FOR GC-FID/MS

Chromatotec® has developed the first TRAP-GC-FID/MS designed for continuous monitoring of Volatile Organic Compounds (VOCs), inorganic molecules and permanent gases. In addition to the mass spectrometer (MS), this system encompasses the same trap, thermo desorption and separation technologies as airmoVOC analyzers (current mCERTS approved GCs analyzers).

For VOCs analysis, the Flame Ionization Detector (FID) and the MS are identifying and quantifying molecules at the same time allowing complete certainty of compounds being analyzed: precise quantification is carried out by the FID while the mass spectrometer verifies the compound identification (using Chromatotec's library).

In the Figure 1, the Benzene concentrations measured by the MS and the FID are displayed. The concentrations measured by FID and MS are very close (0.06 ppb mean difference between both detectors).

In case of saturation of the FID signal, the MS is used for quantification of VOCs. The system can quantify and identify VOCs from ppt to % levels. Also for permanent gases (O2, N2, CO2, Ar, He...) and inorganic molecules, the mass spectrometer is used for quantification and identification. With this system, trends of VOCs, halogenated compounds and permanent gas concentrations are automatically generated.

Thanks to our software Vistachrom, all data are time stamped and recorded on an industrial computer. The gas generators (H2 and air) allow the analyzer to be completely autonomous and can be remote controlled using internet connection. A calibration system installed in the analyzers allows automatic calibration of both FID and MS.

This system has proven its value in process surveillance and optimization. It allows non-specialized people to access high level of analytical information. Moreover the system is cost effective and mCERTs approved to work 24h/7 for more than 3 months without operator maintenance. ■ ■ ■

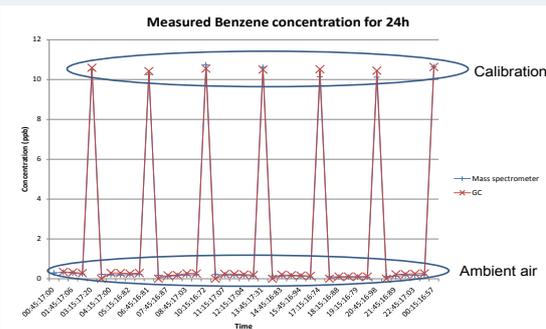


Figure 1: Measured Benzene concentrations for 24H with the GC-MS/FID

Exhibitions in May and June 2014



20-22 May 2014
Stand° 3540

To get an invitation:
info@chromatotec.com

Other Exhibitions in 2014

TECHNICAL DAY - France
Paris - Maison d'Aquitaine
9 October 2014

WWEM - England
Telford, 5 - 6 November 2014

ADIPEC - UAE
Abu Dhabi, 10-13 November 2014

The US EPA leads Photochemical Assessment Monitoring Stations programs (PAMS) for more than 15 years and many equipments used at PAMS sites are old and need to be replaced. That is why US EPA has conducted a material review of fully automatic GC units able to by analyze the 56 VOC ozone precursors of the PAMS list.

They planned to perform an evaluation in two steps:

- Laboratory evaluation of selected units: 8 candidates

- Field evaluation of three selected units after laboratory evaluation: deployment at PAMS field stations.

RTI International based at Research Triangle Park in Durham (North Carolina), has been chosen by the US EPA to organize the tests.

With Consolidated Analytical Systems (CAS), our distributor in the USA who has provided a demo airmOzone unit, we have been selected as one of the 8 candidates. At this time the laboratory phase testing is ended and RTI is currently analyzing the test results of each candidate in order to select the three best units that will be admitted to the field evaluation.

The laboratory phase tests

The testing took place over a period of 3 weeks: first week set up phase in the RTI laboratory, second and third week testing phase.

Two different blends have been chosen: PAMS blend at 100 ppb and Texas Commission on Environmental Quality (TCEQ) blend at 6 ppb. TCEQ is the PAMS blend plus several potential interferent compounds. Both cylinders are diluted using zero air generator and a dilution system with three mass flow controllers (two connected to the cylinders and the other to the generator).

The dilution blend is sent to a manifold where all instrument sample the gas to be analyzed. One TO17 sorbent tube is also connected to the manifold and will be used as reference. Different concentrations and different conditions of temperature (25°C to 35°C) and humidity (20% to 70 %) have been applied during the 9 days of testing.

5 tests were performed each day: zero air test, 3 tests of concentration variation and a last test over the night at a defined concentration between 18h and 4h. The candidates were required to provide a report of the



airmOzone at US EPA laboratory

of the 9 days of testing with sensitivity factors stable and logical regardless of the level of dilution, temperature and humidity applied to the sample. During these tests, we have noticed to RTI several advantages of our unit:

- Compact unit in rack, easily transportable (look at photo here above). We were the only vendor to supply rack mounted system, other units were placed on the laboratory bench

- Autonomous unit regarding the gas supply: air and hydrogen

- Analysis cycle time in 30 mn other units were in 1 h cycle time. This is a considerable advantage when tests last only 1h30. We were able to supply 2 or 3 results when other candidates could obtain only one result.

results of their units before a certain deadline. The list of compounds to be measured has been determined by RTI and corresponds to PAMS list (56 VOC) plus several optional compounds such CCl₄, 1,3 butadiene, alpha and beta pinene.

Acetone has been removed from the study because of too much interference. The laboratory evaluation consists also in other evaluation criteria as usability, reliability and cost. Each candidate has been required to fulfill a table indicating information concerning these parameters.

Conclusion of the laboratory tests

CAS / Chromatotec® team wrote reports during each

NATURAL GAS: COMPLETE ANALYTICAL SOLUTION

Chromatotec® has developed in its Research & Development laboratories, a new instrument for hydrocarbon (C1-C6+) measurements and calorific values as well as WOBBE index computation.

This analyzer is based on chromatography principle using a Thermal Conductivity Detector (TCD). The sample will be separated into the column and quantified by the detector. A difference of thermal conductivity between the reference gas (carrier gas) and the sample gas will allow the quantification of hydrocarbons.

The identification of compounds will be made as for all chromatographic systems with the retention time. Measured concentrations are obtained and displayed via Vistachrom Software and are used to calculate calorific values and WOBBE index. These data give analytical information allowing full characterization of natural gas calorific capability.

The analyzer is robust, easy to use for non-specialized operator and requires very low maintenance.

For a complete natural gas analysis, this instrument can be coupled to a chromaFID (BTEX and others VOCs measurement) and an energyMEDOR (for sulfur and mercaptan measurements). Due to its new improvements, Chromatotec® provides a full analytical solution for natural gas monitoring. ■■■

COMPLETE ONLINE MONITORING SOLUTION FOR WASTE WATER TREATMENT PLANT

Due to the increasing number of requests for the monitoring of waste water treatment plant atmosphere, Chromatotec® has designed a specific analytical solution for sulfur and nitrogen compounds analysis.

For more than 25 years, Chromatotec® has proven its value and expertise in measuring and recording sulfur concentrations in waste water treatment plant. Chromatotec® has completed its sulfur analyzer range with a new system dedicated to the measurement of ammonia and sum of amines. To the best of our knowledge, no analytical systems

are available on the market for this application.

Therefore, Chromatotec® is glad to propose its solution for nitrogen compounds analysis. It has a specific nitrogen compounds detector working with a ceramic ion source. A hot, chemically reactive gas boundary layer is formed at the surface of the ceramic and chemical reactions occur at the immediate vicinity of the ion source. Samples react with the boundary layer and are decomposed. Nitrogen compounds will be detected by the collector after decomposition. Then, the obtained signal will be collected and transferred to Vistachrom Software

for full results traceability.

The system can also remote controlled and all data can be transferred to an external computer or data logger. Due to the specificity of the ceramic, nitrogen compounds can be analyzed from ppb (µg/m³) for amines to ppm (mg/m³) for ammonia.

Also, we can propose a specific detection system for phosphorous compounds and oxygenated compounds. This new range of analyzers will be perfectly suited for entering new markets and applications. ■■■

EUROPE – FRANCE
15 Rue d'Artiguelongue
33240 Saint-Antoine
Tel +33 (0) 557 940 626
Fax +33 (0) 557 940 620



NORTH AMERICA – TX
18333 Egret Bay Blvd, Suite 270
Houston TX 77058
Tel +1 (281) 335 4944
Fax +1 (281) 335 4943



ASIA – CHINA
Room 1806, Building 1,
Wanda Plaza, No.93, Jianguo
Avenue, Chaoyang District,
Beijing 100022, China
Tel +86 (0) 105 960 3283

