Analysis and monitoring of wastewater quality for refinery processes

Context & Challenges

Following the publication of a ministerial decree on August 24, 2017, French industrial activities must meet compliance requirements on the quality of discharges of hazardous substances into water from environmental protection installation. Industrials are particularly targeted by these new guidelines and must adapt their monitoring systems.

Molecule	N° CAS	SANDRE Code	Limit value of concentration	Flow threshold
Benzene	71-43-2	1114	50 µg/l	If the release exceeds 1g/j
Toluène	108-88-3	1278	74 µg/l	If the release exceeds 2g/j
Xylènes (Somme o,m,p)	1330-20-7	1780	50 µg/l	If the release exceeds 2g/j

Extract from the ministerial decree 24/08/2017 / NOR: TREP1713284A
https://aida.ineris.fr/consultation_document/39706

Chromatotec® Solutions

Chromatotec® has developed a solution equipped with an MCERTS certified GC FID, analyzing VOCs dissolved in liquids, by purge & trap sampling system (according to the EPA 502-2 standard) or headspace. This system therefore makes it possible to extract VOCs from a liquid and analyze them by a GC, in order to identify and quantify all the contaminants in the water : BTEX as well as light to SVOCs. Concentration of BTEX/VOCs can be analysed down to 1 ng/l level and up to 15 000 µg/l with automatic embeded dilution system.

This cutting edge technology includes an automatic water sampling system with a fast loop. The sampling is made below the surface of the liquid, to avoid aspiration of floating particles and to stay away from the bottom of the tank and avoid extraction of sludge. This sampling system is placed outside a box, near the place where waters are collected. A pump is carrying liquids to the sampling and filtration box, and then inside the analytical shelter where the analyzer is installed.

This all in one solution is composed of an airmoVOC analyzer, hydrogen generators and zero air catalyzer, an internal calibration allowing to obtain reliable results, in real time and without human intervention.

airmoVOC WMS

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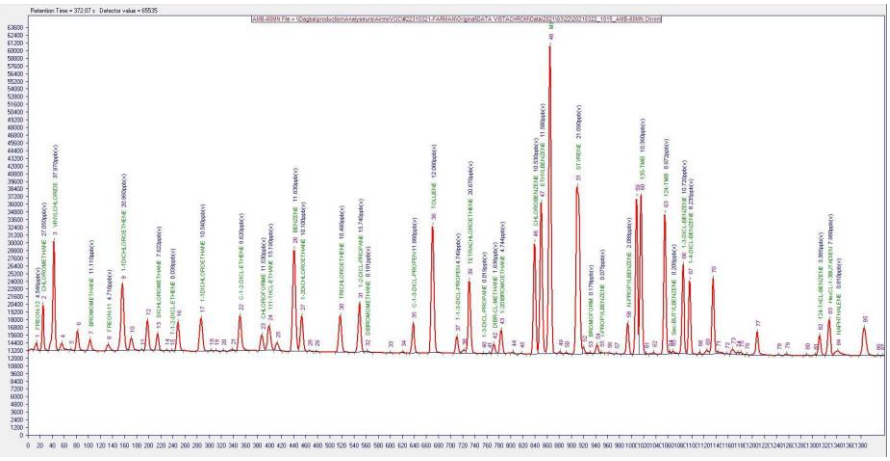
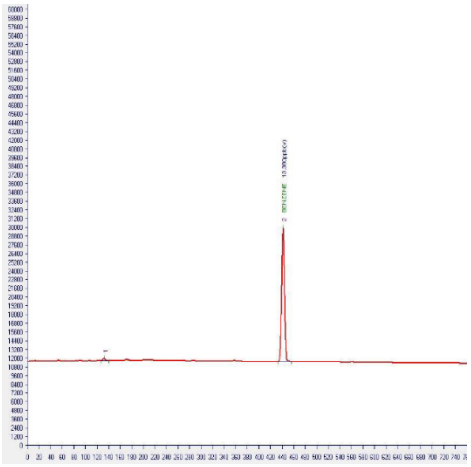
The airmoVOC WMS is used in the water markets of the food processing, the pharmaceutical industry, cosmetics and perfumery and also in the analysis of drinking water, beverages and drinking water, surfaces, food liquids (milk, soda, wines, spirits…).



Chromatogram obtained with airmoVOC WMS



Focus on Benzene

Ease of use:

- Waterproof cabinet, protected from wet projections and aggressive atmospheres
- No auxiliary gas needed for operation and calibration
- Hydrogen, nitrogen and air consumption
- Reliable FID detector
- Integrated sampling pump enables analysis of atmosphere pressurized sample
- Automatic internal calibration with certified permeation tubes at ppb or ppm level

Data acquisition and treatment:

Data are automatically collected by Vistachrom software and interface. Datas like concentrations, retention times, analyzer status … can be transferred by Modbus protocol or 4-20mA analog output, directly to a supervision room. With the inbuilt LCD color touchscreen, the edition, viewing and transfer of the chromatograms becomes a lot easier. A calculation module manages the results to perform a daily average of the concentrations, retention times, etc … of the selected compounds.

Conclusion

- Autonomous analyzer
- Compounds speciation with chromatography technique
- Linearity for each component
- Robust instrument, minimum maintenance needed
- State of the art PC and software solutions (Modbus, calculation modules, Windows embedded based software)
- Integrated calibration device with permeation tube for automatic data validation
- ppb or ppm analyzer version available
- Certified by Mcerts

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