Ambient Air Monitoring Applications

Ambient air monitoring by FID detection – airmoVOC BTEX

Context & Challenges

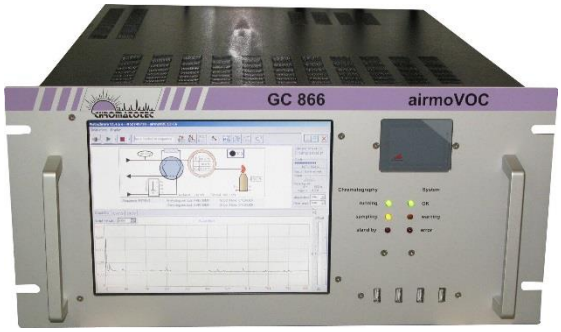
Urban pollution is a problem that concerns more and more people in charge of public health. In large cities, car emissions are an important source of atmospheric pollution. This problem is growing as the traffic keeps on increasing. BTEX compounds are present in car emissions. It is therefore important to be able to analyze them with short analysis cycle duration and on a continuous and automatic way.

Chromatotec® Solutions

The note presents the analysis of ambient air BTEX by trapping of the compounds on adsorbent.

The air is sampled at ambient temperature by a trap. This system allows performing a pollution monitoring on a quasi-continuous mode (sampling during 75% of the time). The trapped compounds are then thermo-desorbed.

The compounds are separated using a metallic capillary column and detected with a flame ionisation detector (FID). The analysis are treated by an integrated microprocessor, and the results are transferred towards a PC where easy to use software allows to visualise and to retreat the results if necessary. Intern calibration systems allows for calibration and validation of results.



Technical information and results

A typical chromatogram of BTEX in ambient air is shown in Figure 1. The results are displayed using Vistachrom software. All results can be re-treated using peak viewer software. On the chromatogram, one can see that concentrations as low as 10 ppt can be measured.

A trend obtained on a period of 60 hours in the country side near Bordeaux is shown in Figure 2. Due to the short resolution time, the instrument allows for monitoring of pollution due to traffic.
As it is shown on the Figure 3, the retention times are very stable over 60h. It shows that the instrument is perfectly suited for continuous automatic monitoring of BTEX.

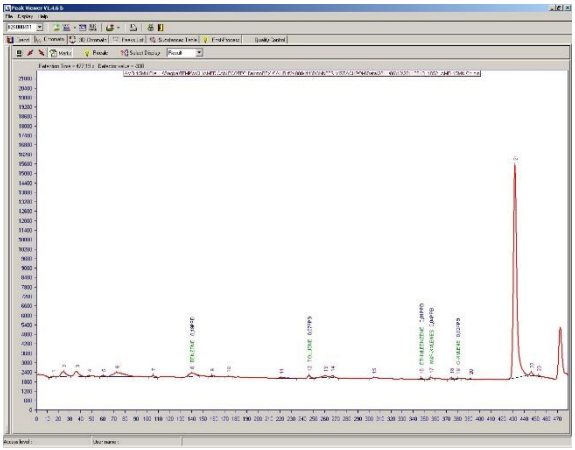


Figure 1 - chromatogram of 476 ml of ambient air (Bordeaux area)

Analytical conditions: airmoVOC BTEX

Sampling: ≈ 476 ml of ambient air.

Carrier gas: cylinder hydrogen (≈ 400 hPa)

Column: MXT 30CE, film thickness: 1 µm, id: 0.28 mm, length: 30 m

Amplification: high (level 3)

Cycle duration: 15min

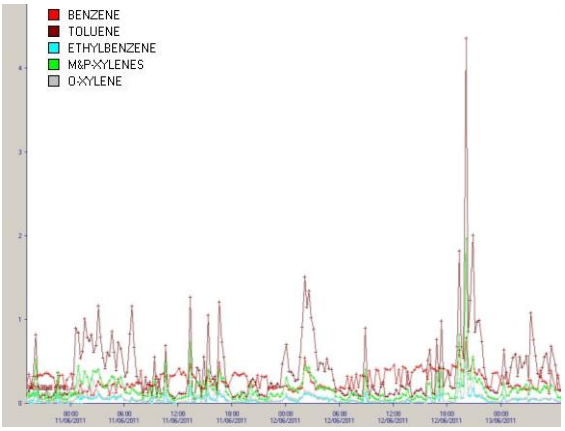


Figure 2 - histogram of BTEX concentrations on a period of 60 hours (country side near Bordeaux)

Conclusion:

airmoVOC BTEX is perfectly suited for the monitoring of Benzene, Tolulene, Ethylbenzene and Xylenes. It allows the measurement of low and very low BTEX concentrations (ppb and ppt). As the instrument is very stable and robust, it does not need maintenance on daily basis. Also, data can be transfered automatically using modbus or remote control.

For more information about the performance of our instruments, please have a look at the NPL report for the MCERTS Certification on our website.

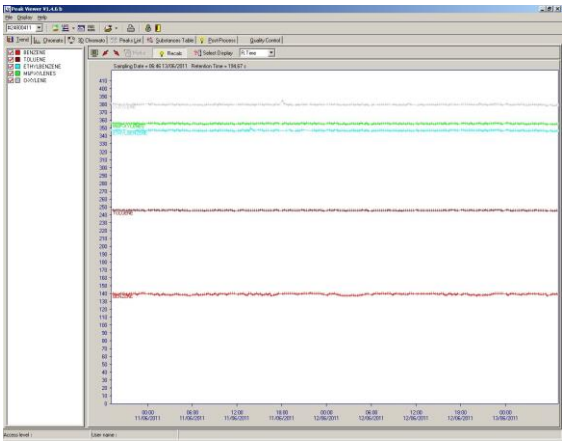


Figure 3 - histogram of BTEX retention time over 60 hours