

ADEME

 Agence de l'Environnement
et de la Maîtrise de l'Energie

**Club ADEME
International**

Duration
2 months

Total costs
Less than 200 k €

Staff mobilized
3 people

Thematic



Benefits performed

Services
HQE Certification
(High environmental quality)
Construction

What they said

Quick implementation and
easy to use.

«A high-performance, complex
solution for an inexperienced
user».

«A real mobile lab on 1m² and
operating in full autonomy
without gas bottles»


CHROMATOTEC

Analysis of Ozone Precursors and Volatile Polycyclic Aromatic Hydrocarbons (vPAHs)

in Air with Scalable Continuous Measurement Solutions

VOCs are, for the most part, pollutants coming from human activity that contribute to ozone formation. European standards for ambient air monitoring focus on the measurement in the air of those that most negatively affect human health: the BTEX. This family of compounds, belonging to VOCs, is carcinogenic, toxic and mutagenic and its inhalation exposure values are regulated.

Chromatotec collaborates with several national and international institutions to better understand the impact of these toxic substances. Many institutes study their generation in atmospheric simulation chambers such as those of the prestigious CNRS Orleans or LISA which are equipped with the latest Chromatotec technologies.

With the GC FID MS auto analyzer «airmosCAN XPERT», the CNRS wanted to have the most successful market solution for continuous monitoring at ppt (ng/L) of at least 123 VOCs, including BTEX and vPAHs: more than twice the number of compounds recommended by the US EPA (United States Environmental Protection Agency) on their list of 56 PAMS (Photochemical Assessment Monitoring Stations) target hydrocarbons. EPOC laboratory in Bordeaux, as well as the Ecole des Mines de Douai, focus on vPAHs (C₆ to C₁₆). Due to the large number of compounds, it may be necessary to combine Flame Ionization Detection (FID) and individual Mass Spectrometry (MS) identification to avoid separation,

French partners



CNRS Orléans



LISA (Interuniversity Laboratory of Atmospheric Systems) in Paris



EPOC (Oceanic and Continental Environments and Paleoenvironments) in Bordeaux



Foreign partners

- MOECC (Ministry of Environment Climate Change in Canada) for Benzene and 1,3-Butadiene
- Chinese referent institutes



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interference and quantitation problems in case of coelution. Results are automatically validated by comparing both detectors to provide certified data.

Main phases

Analysis of the situation, development of methods and adaptation to the needs, installation, user training, following up the progress of the project, validation of results, communication: reports, scientific publications, articles on the website.

Local customers and beneficiaries

EPOC, IPREM (Institut des Sciences Analytiques et de Physico-Chimie pour l'Environnement et les Matériaux) in Pau, Air Quality Networks (ATMO).

The same equipment allowed the study of the effect on mice of polluted atmospheres, such as the one in Beijing, reproduced in LISA's atmospheric chamber. These latest technologies are part of a cross-comparison campaign on 1,3-butadiene in ambient air in collaboration with the LCSQA (Central Laboratory for Air Quality Monitoring) as part of the national survey on the birth of children without arms in the southern region of France. Lastly, measurement campaigns took place in a pine forest in the region of Aquitaine to compare the substances present in the atmosphere with the theoretical study of the reactivity of terpenes (oxidation and particle formation).

Post-project results

Projects with the Ecole des Mines de Douai (EMD) and other national and international projects (France, China, India, Poland, USA, Canada, Chile)

Ecological/climate indicators

Better characterization of ambient air with understanding of the mechanisms of ozone formation and indirect monitoring of the health impact linked to prolonged exposure of individuals to ozone precursors in different countries, beyond only BTEX.

With more than 130 members, the Club ADEME International assists the SMEs in its network in the development of innovative projects and international partnerships. The objective is to participate in the dissemination of French knowledge, by supporting the private and public sector in the ecological and energy transition sector in order to meet global environmental and climate challenges.

For more information : www.clubinternational.ademe.fr



Club ADEME International | Exemplary project sheet - January 2020



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