PhD position in atmospheric/analytical chemistry (2018-2021) at INERIS (France).

***NTSOA (non-target screening of organic aerosol)**: Chemical characterization of atmospheric organic aerosols using non-target screening approaches.*

Keywords

Atmospheric chemistry, Aerosol, Non-target screening, Reactivity, Sources, Air quality

Context and objectives

Knowledge of organic aerosols (OA), accounting for roughly half of the mass of fine particulate matter ($PM_{2.5}$) in the troposphere, is essential in terms of health and climate impacts. Their sources, formation processes and chemical composition are still relatively unknown. The measurement of specific marker compounds, chemical fingerprint or molecular fragmentation allow to distinguish and apportion the primary or secondary OA origins (POA or SOA). However, to date, there is no specific marker for several emission sources or secondary processes of prime interest. The emergence of the high-resolution mass spectrometry (HRMS) suggests a more comprehensive characterisation of the atmospheric pollutants, based on non-target methodologies, can be reached. The objective of this PhD work is to identify molecular markers or chemical patterns of primary or secondary OA sources of interest which will be used in source-receptor models to apportion these sources non-resolved until now. The work will be based on a detailed OA chemical characterization using conventional chemical analyses (target) and innovative ones (non-target) by liquid or gas chromatography coupled to HRMS (LC-HRMS, GC-HRMS). Two sources will be primarily investigated given the significance of their contributions on ambient air PM concentrations: biomass burning ("residential wood combustion" vs "green waste burning") and vehicular emissions ("gasoline" vs "diesel"). An attention will be focused on oxidation processes of these both sources occurring in the atmosphere (aging). Experiments will be performed to identify molecular markers or chemical patterns more representative of the aerosol state observed in ambient air.

Candidate profile

- Master in Environmental Chemistry/Analytical Chemistry.
- Lab and field work interest.
- Knowledge in atmospheric physic-chemistry.
- Knowledge in analytical–chemistry (sample preparation, GC-MS, LC-MS).
- Computer knowledge and data analysis.
- Autonomy, adaptability, communication and writing abilities.
- Good English level.

Useful information

Place of PhD work: INERIS (Verneuil en Halatte, France) = 100 %

PhD start: January 2018

To apply: Send CV + cover letter before 31/10/2017.

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