

## Chemical characterization of organic aerosol particles using high resolution mass spectrometry

### Context and objectives

Knowledge of organic aerosols (OA), accounting for roughly half of the mass of fine particulate matter (PM<sub>2.5</sub>) in the troposphere, is essential in terms of health and climate impacts. Their sources, formation processes and chemical composition are still relatively unknown. The use of high-resolution mass spectrometry (HRMS) permits to get a more comprehensive characterization of the OA fraction notably based on non-target screening approaches. Such methods are helpful to identify molecular markers or chemical patterns of primary (POA) or secondary OA (SOA) sources of interest, later used in PM source apportionment models. In addition, the detailed chemical OA characterization is helpful in the understanding and description of SOA formation pathways.

The work during this internship will be based on a detailed OA chemical characterization using innovative chemical analyses (non-target) by liquid and/or gas chromatography coupled to HRMS (LC-HRMS, GC-HRMS). Several samples obtained from either, light duty vehicle exhaust emissions, or reactivity chamber experiments (SOA formed from vehicle exhaust emissions or selected gaseous precursors by reaction with atmospheric oxidants such as OH or NO<sub>3</sub> radicals) will be studied. Depending on the samples studied, the final objective will be to identify the main secondary species formed from specific precursors and propose potential formation pathways, or to identify molecular markers or chemical patterns specific of secondary "gasoline" vs "diesel" vehicular emissions.

This work will be performed at INERIS (40 min from Paris, <http://www.ineris.fr>).

### Student profile

- Master's degree in environmental chemistry/Analytical Chemistry.
- Research and lab work interest.
- Knowledge in analytical chemistry (sample preparation GC-MS, LC-MS, GC-Q/Tof-MS, LC-Q/Tof-MS).
- Knowledge in atmospheric chemistry if possible.
- Autonomy, adaptability, communication and writing abilities.
- Good English level.
- Indemnity: about 542 €/month on average (3.75 €/h) + transportation according to INERIS' scale + staff canteen.
- Beginning January/February 2020 for 6 months

### Contacts:

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