RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

INERIS
maîtriser le risque pour un développement durable

INTERNSHIP OFFER

Characterization of gaseous phase secondary organic aerosol molecular markers for air quality assessment

Nos réf. : Ineris - [CGR] - ID 2726173

Publication date : 17/07/2025
Location : Verneuil-en-Halatte (60) - accessible en transports en commun, à 40 mn au Nord de Paris
Type of contract: internship
Contacts : Alexandre ALBINET, alexandre.albinet@ineris.fr; Ahmad EL MASRI, ahmad.el-masri@ineris.fr

CONTEXT

Ineris (National Institute for the Industrial Environment and Risks) employs around 500 people and serves as a national reference body under the supervision of the French Ministry of the Environment. Its primary mission is to conduct studies and research aimed at preventing risks that economic activities pose to the safety of people and property.

Joining Ineris offers an opportunity to apply and enhance your skills through research, support, and expertise missions on behalf of public authorities and industry. Ineris has 30,000 m^2 of laboratories and facilities equipped with state-of-the-art instrumentation and equipment.

INTERNSHIP OBJECTIVES

Impact of aerosols (tiny particles suspended in the air) on air quality and health is now well recognized. If aerosols are formed of a complex mixture, organic matter (organic aerosol, OA) represents a large fraction of the total mass of the fine particles in the atmosphere. OA sources, formation processes and chemical composition remain quite unknown. Organic compounds directly emitted in particulate phase in ambient air are defined as primary organic aerosol (POA). Besides, a large fraction of organic aerosol, secondary organic aerosol (SOA, 80 to 90 % of total OA in some locations) is produced by homogenous (in gas phase) and heterogeneous (gas/particle) reactions of volatile and semi-volatile organic compounds (VOCs and SVOCs) as well as aging of organic aerosols. Unlike primary aerosols, directly emitted into the atmosphere from characterized sources, secondary aerosols cannot be regulated. In this context, the discrimination of POA and SOA sources is fundamental.
SOA molecular markers from specific VOCs (e.g. SOA-biogenic: pinic acid, pinonic acid, 2-methylthreitol, 2-methylerythritol, β-caryophyllinic acid, MBTCA; SOA-anthropogenic: DHOPA, phthalic acid, SOA-Biomass Burning: methyl-nitrocatechols…) can provide insights into the processes and sources influencing SOA formation and spatiotemporal distribution. The main objective of this work is to characterize SOA markers from gaseous samples collected during the ACROSS field campaign (June-July 2022, https://across.aeris-data.fr/) in different sampling locations (Rambouillet forest, Paris city center). The quantification of several SOA markers will be performed by GC-MS/MS. By analyzing both gaseous and particulate phases,

the study aims to assess the gas/particle partitioning of these compounds, ultimately improving our understanding of their sources and chemical formation processes.

This work will be performed at INERIS (40 min from Paris, http://www.ineris.fr) in the operational unit ANAE (Analytical Methods and Developments for the Environment).

PROFILE

Master or equivalent in Environmental chemistry or Analytical Chemistry.

Experience/Skills

- Laboratory and research work interests.
- Knowledge in analytical chemistry (GC-MS, GC-MS/MS, derivatization).
- Knowledge in atmospheric chemistry/air quality is a plus.
- Autonomy, scientific rigor, adaptability, teamwork, open-mindedness, analytical skills, and writing abilities.
- Good oral and written English skills.

MISCELLANEOUS

- Location: 100% INERIS
- Desired start date: February-March 2026 for 6 months

Application procedure:

The application must include: a CV, the grades obtained in the M1 and in M2, a letter describing your motivation and your interest in working on the proposed subject and possibly, one or more letters of recommendation from your current or past teachers and/or supervisors.

- Indemnity: about 550 €/month
- Flexible hours
- Staff canteen
- Charging stations for electric vehicles

Our job offer is open to all. We aim to integrate new talents into an inclusive work environment.