

Title

State-of-the art in off-line characterization of the organic content in atmospheric aerosol

Scientific summary

Atmospheric aerosols play a key role in many environmental processes. They can affect the optical properties and lifetime of clouds and thus alter the radiative balance in Earth's atmosphere. Atmospheric aerosols are also important because of their impact on human health. Epidemiological studies have established that exposure to atmospheric aerosols is associated with damaging effects on the respiratory and cardiovascular systems, and can lead to asthma, oxidative stress, health deterioration and even death. Atmospheric particles typically contain 30-80% by mass of organic compounds. Some of the compounds are primary in origin and serve as markers for specific processes such as biomass burning or automotive exhaust and can be used to identify the origin of the particles. Many other species are secondary in origin (secondary organic aerosol, SOA) and are formed as a result of the atmospheric oxidation of volatile organic compounds. Detailed information on the organic content of atmospheric aerosol is thus required in order to fully understand its impact on human health and climate.

Information on the organic content of atmospheric aerosol can be obtained by on-line and off-line measurement techniques. On-line techniques have the advantage of providing real-time data, but only for a limited number of species. In addition, the instrumentation required for on-line measurements is often prohibitively expensive and difficult to use. As a result, there is considerable interest in the development and use of off-line methods for the characterization of the organic content in atmospheric aerosol. The aim of this workshop is to provide a timely review of this research area and establish future research directions.

The objectives of this workshop are

- to review the state-of-the-art in the use of off-line methods for characterization of the organic content of atmospheric aerosol
- to provide knowledge about the advantages and limitations of the various techniques and their application to ambient measurements and chamber studies
- to investigate the potential of the participating researchers to collaborate in a joint research activity or inter-comparison campaign.

To achieve its objectives, the workshop will bring together 20-30 participants with a wide range of scientific expertise in the development and application of off-line methods for analysis of the organic content of atmospheric aerosols. A series of lectures covering the full range of sampling, extraction, analytical techniques and applications will be supplemented by focused discussions. Each of these sessions will have a rapporteur who will be responsible for preparing a summary which will be presented at the final discussion. A report covering recent developments, gaps in existing knowledge and topics for further research will be produced.

The workshop will be hosted at the SP Swedish National Testing and Research Institute, Department of Chemistry and Materials Technology during March 26 – 28, 2007. Attention will be made to also ensure participation of young scientists that are working in the research area. An application for additional funding will also be made to the European project EUROCHAMP and the host institute SP. The requested support includes accommodation (not Swedish participants), meals for all participants and travel expenses for PhD students and invited speakers.

Abstract

The workshop will provide a state-of-the-art review of the use of off-line methods for characterization of the organic content of atmospheric aerosol. It will bring together 20-30 participants with a wide range of scientific backgrounds, countries and experiences and enable the following topics to be addressed: new methods for sampling and analysis, application to ambient measurements and chamber studies and links to modelling and health. This workshop will take place in Boraas, Sweden during March 26 – 28, 2007.