AIR QUALITY MONITORING: CHEMICAL CHARACTERIZATION OF ATMOSPHERIC AEROSOL

There are evidences that chemical composition of atmosphere can be associated to risks for human health, particularly in towards quantity and quality of disperse atmospheric particulate matter (PM). Investigation of air quality is dedicated to both well-known toxic compounds (for environment and habitants), and specific molecules that have been recognized as markers able to give information about sources and processes taking place in the atmosphere. These studies have interesting fallout facts for Environmental Chemistry and Toxicology because they are primarily important for determining atmospheric pollution sources and for identifying strategies to reduce the impact on human health.

GOALS

Ultimate goals of this research topic is: i) to investigate chemical composition (both metals and organic fractions) of atmospheric particulate matter; ii) to develop and to optimize analytical methods for trace analysis of atmospheric samples; iii) to set-up methodologies for better environmental monitoring; iv) real case studies aimed at monitoring the air quality; v) data mining and processing for results interpretation.

INSTRUMENTS AND METHODS

Several instrumental techniques are used in order to reach purposes of this research activities: gas chromatography (GC), liquid chromatography (HPLC), atomic emission (AES) and absorption (AAS) spectroscopy. Research group laboratories are equipped with modern, advanced instruments that hyphenate separation techniques as mentioned above with sensitive and selective detection methods (i.e., Mass Spectrometry): HPLC-MS, GC-MS and ICP-MS are fully available in our group. Additionally, modern approaches for sample treatment are used (i.e., solid-phase extraction, SPE, and solid-phase micro extraction, SPME).

MAIN SUBJECTS

Analytical Chemistry; Environmental Chemistry; Separation Science.

RESEARCH GROUP

Maria Chiara Pietrogrande
Alberto Cavazzini
Luisa Pasti
Nicola Marchetti
Catia Contado
Maurizio Remelli

COLLABORATIONS

The research group is involved in active national (Istituto ISAC-CNR Bologna, ARPAE Emilia Romagna, ARPA Lombardia) and international (Department of Analytical Chemistry, University of Helsinki, Finland; Department of Analytical Chemistry, University of Santiago de Compostela, Spain) collaborations.