

UNIVERSITY OF MACAU
FACULTY OF SCIENCE AND TECHNOLOGY
DEPARTMENT of
CIVIL AND ENVIRONMENTAL ENGINEERING

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**" Understanding Secondary organic aerosol
(SOA) – Applications of a Chemical Ionization
Mass Spectrometer "**

by

[Prof. Mattias Hallquist](#)

Professor, Department of Chemistry and Molecular Biology,

University of Gothenburg, Sweden

Date: 18/11/2016 (FRIDAY)

Time: 2:30PM – 3:30PM

Venue: E11 – 1009

Abstract

The secondary organic aerosol (SOA) represents a dominant fraction of the tropospheric aerosol. Still, the current level of understanding of SOA processes is remarkably low compared to other processes in aerosol science, i.e. modelled SOA based on

experimental findings and existing theory do not capture the variability of observed SOA loadings. Lately, models have been improved by adding sources/processes to reduce the bias but still there is no model that is capable of describing SOA satisfactorily while capturing a large temporal and spatial variability. The uncertainties associated with SOA relates to its formation from atmospheric oxidation of volatile organic compounds (VOCs). The complexity is compounded further by the fact that each VOC can undergo a number of atmospheric degradation processes to produce a range of oxidised products, which may or may not contribute to SOA formation and growth.

Using High-Resolution Chemical Ionisation ToF-MS (HR-CI-ToF-MS), with high resolution ($>5000\text{m}/\Delta\text{m}$), makes it possible to distinguish the molecular identity of numerous compounds in complex mixtures for both gas and particle phase. The instrument applies soft ionisation limiting the fragmentation and one can usually identify the parent molecules. The speaker's research group has since a few years applied HR-CI-ToF-MS to measurements both in laboratory, for emission studies and in field observations. The presentation will include a survey of SOA with some examples from these recent studies.

Biography

Professor Mattias Hallquist has been active in the field of atmospheric science since 1993, when doing a PhD with emphasis on chemical kinetics and mechanisms of organic compounds. After a postdoc session at the University of Cambridge he returned to the University of Gothenburg (GU) at Department of Chemistry and Molecular Biology. Currently, he is leading the secondary organic aerosols (SOA) and traffic emission group and coordinating a multi-project framework (5 year project) on Photochemical Smog in China (Research-Policy). Professor Hallquist is supported by the strategic area: sustainable transport initiative where the focus is air pollution research in developing countries. Professor Hallquist has a profound expertise in aerosol and atmospheric chemistry and is coordinating an initiative on Atmosphere-Climate-Ecosystems at GU.

ALL ARE WELCOME!