Name of research institute or organization:

EMPA Materials Science and Technology

Title of project:

Emissions of Non-Regulated Oxidized Volatile Organic Compounds by advance GC-MS Technology (ENOVO)

Project leader and team

Geir Legreid, Stefan Reimann, Johannes Stähelin, and Martin Steinbacher

Project description:

Oxygenated Volatile Organic Compounds (OVOCs) were analyzed during four seasonal measurement campaigns at both a background site (High Alpine Station Jungfraujoch) and an urban site (Zürich) in Switzerland. The campaigns lasted for about one month each. OVOCs are toxic to human health and precursors for ozone and secondary organic aerosols, and data on their emissions is limited. For the analysis a newly developed double adsorbent sampling system coupled to a GC-MS was used. The high Alpine station at Jungfraujoch is located at 3580 m a.s.l. in the Swiss Alps and is a unique location for studying the chemistry of the lower free troposphere and transport phenomena. The compounds of main interest were C1-C5 alcohols, C2-C6 carbonyls and selected VOCs. The seasonal differences were of interest as well as the different sources for the OVOCs. The OVOCs are not only emitted from anthropogenic and biogenic sources, but also produced by oxidation processes in the atmosphere [1] which complicates the interpretation. Source profiles from the urban measurements in Zurich were used to distinguish the influence of primary and secondary OVOCs at the high Alpine background site.

Primary source regions for these compounds will be identified from back-trajectory analysis, and their source strengths will be calculated from average ratio of the OVOCs versus carbon monoxide (CO) concentrations during pollution events [2].

References:

[1]: Singh, H. B., L. J. Salas, et al. (2004). *Journal of Geophysical Research-Atmospheres* **109**(D15): art. no.-D15S07.
[2]: Reimann, S., D. Schaub, et al. (2004). *Journal of Geophysical Research-Atmospheres* **109**(D5): art. No. –D05307.

Key words:

Air pollution, Seasonal measurements, Oxidized Volatile Organic Compounds (OVOCs)

Collaborating partners/networks:

Bundesamt für Umwelt (BAFU)/ Federal Office for the Environment (FOEN)
Labor für Atmosphärenchemie, Paul Scherrer Institut
University of Bristol, School of Chemistry

Scientific publications and public outreach 2005:

Conference contributions

Legreid, G., Reimann, S, Steinbacher, M. and Stähelin, J., "OVOCs at the high alpine station Jungfraujoch: In-Situ measurements and assessment of anthropogenic sources", Urbino, Italy, September 12 – 16, 2005.

Address:

EMPA
Laboratory for Air Pollution/Environmental Technology
Ueberlandstrasse 129
CH-8600 Dübendorf

Contacts

Geir Legreid
Tel.: +41 1 823 4945
Fax: +41 1 821 6244
e-mail: geir.legreid@empa.ch