

Intercomparison of Oxygenated Volatile Organic Compound (OVOC) Measurements

Oxygenated volatile organic compounds (OVOC) are important players in tropospheric photochemistry. They are emitted from anthropogenic and natural sources but also formed in the photochemical transformation of other VOC.

Within this activity a workshop was held at the Research Centre Jülich, Germany, October 11-12, 2004, to prepare the intercomparison experiment at the atmosphere simulation chamber SAPHIR.

In the period October - December 2004 intensive preparatory work was carried out to ensure a successful intercomparison experiment. Various tests concerning the stability of mixtures of OVOC were done as well as tests introducing those mixtures into the SAPHIR chamber. Additionally, hardware components such as manifolds, inlet lines, and gas supply for the different instruments were set up and tested.

The intercomparison experiment was carried out January 17-28, 2005. 12 groups participated in this intercomparison with a variety of different instruments covering the whole range from standard techniques to newly developed methods. The intercomparison was conducted as a formal "blind" intercomparison. The referee is Eric Apel, NCAR, Boulder, CO, USA.

List of compounds intercompared in this experiment:

formaldehyde, acetaldehyde, butanal, hexanal, methanol, ethanol, 1-propanol, 1 butanol, methacrolein, methyl vinyl ketone, acetic acid methyl ester, acetone, benzaldehyde, 2-methyl-3-buten-2-ol

n-butane and toluene were added as tracers for dilution processes in SAPHIR and as reference compounds for gas chromatography.

According to our experience with previous intercomparison experiments the results of such an intercomparison lead to a substantial improvement of the measurement techniques.

The results of the ACCENT OVOC intercomparison activity will

- improve the methods for the measurement of OVOC in the atmosphere, foster analytical training,
- enhance the transfer of knowledge through scientific and technical communication among the participants,
- demonstrate the importance of regular proficiency tests to stay abreast of advancing technology.

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Participants

ACCENT OVOC Intercomparison Workshop, October 11 - 12, 2004



List of participants (in alphabetical order):

Stefan Altenschmidt	FZJ
Bob Blake	ULEICS
Theo Brauers	FZJ
Paolo Ciccioli	CNR
Elena Gómez Alvarez	CEAM
Armin Hansel	University of Innsbruck
Christoph Holzke	FZJ
James Hopkins	University of York
Markus Jocher	FAL Agroscope, Switzerland
Jürgen Kesselmeier	MPICHEM
Einhard Kleist	FZJ
Nina Knothe	MPICHEM
Ralf Koppmann	FZJ
Geir Legreid	EMPA, Switzerland
Konrad Müller	IFT
Christian Plass-Dülmer	Meteo. Observ. Hohenpeissenberg, GAW, Germany
Norbert Schmidbauer	NILU
Sheena Juliet Solomon	IUP,UB
Rainer Steinbrecher	FZK/Garmisch-Partenkirchen
Ralf Tillmann	FZJ
Robert Wegener	FZJ
Kevin Wyche	ULEICS
Dickon Young	University of Bristol

ACCENT OVOC Intercomparison Experiment, January 17 - 28, 2005
Research Centre Jülich



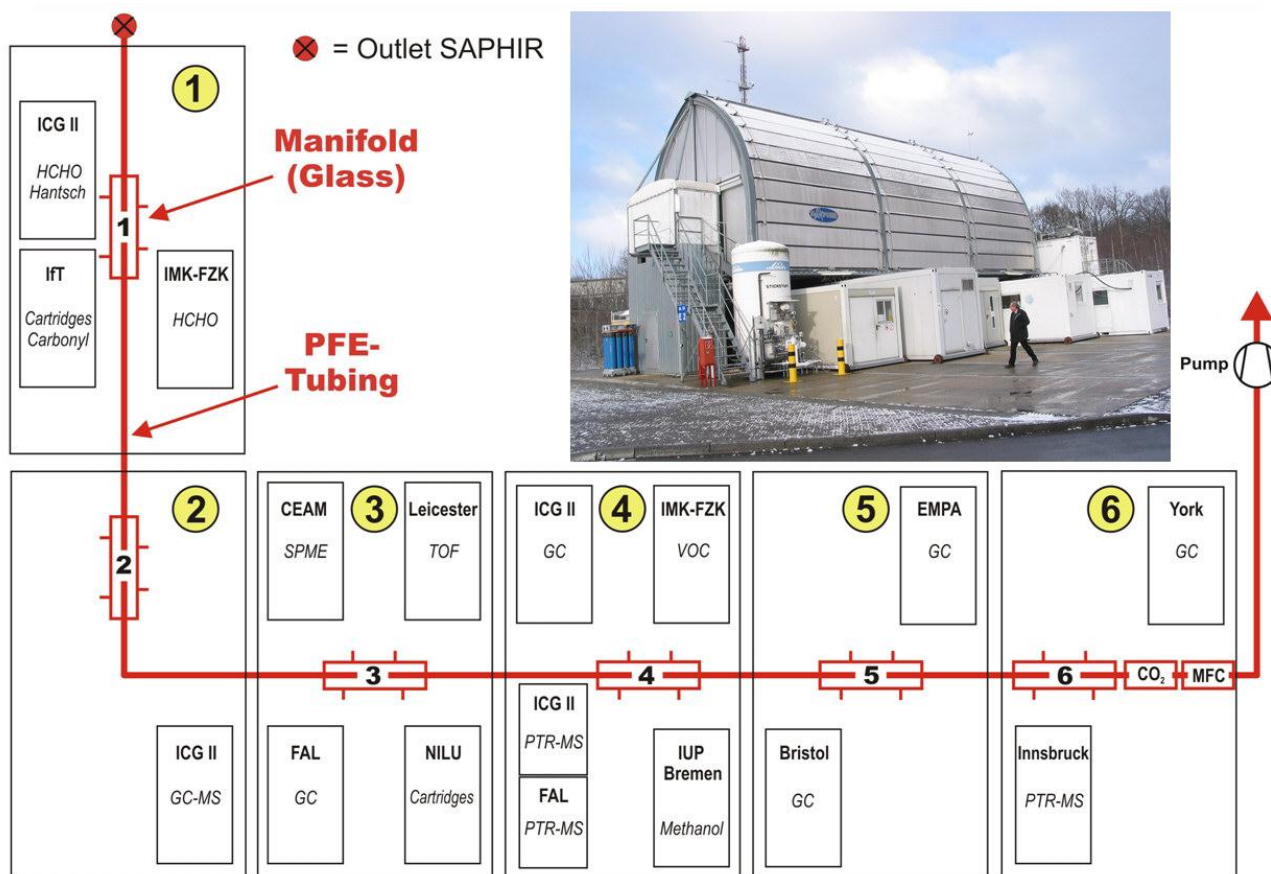
List of participants (sorted by institute):

Ralf Tillmann	FZJ
Ralf Koppmann	FZJ
Christoph Holzke	FZJ
Robert Wegener	FZJ
Jens Boßmeyer	FZJ
Aurelia Brunner	FAL Agroscope
Taina Ruuskanen	FAL Agroscope
Markus Jocher	FAL Agroscope
Christoph Spirig	FAL Agroscope
Dominik Steigner	FZK-IFU
Rudolf Meier	FZK-IFU
Rainer Steinbrecher	FZK-IFU
Elena Gómez Alvarez	CEAM
Konrad Müller	IFT
Sheena Juliet Solomon	IUP,UB
Dickon Young	University of Bristol
James Hopkins	University of York
Geir Legreid	EMPA
Armin Wisthaler	University of Innsbruck
Bob Blake	ULEICS
Kevin Wyche	ULEICS
Alex Parker	ULEICS
Arve Bjerke	NILU

Referee: Eric Apel, NCAR

Intercomparison Experiment

Setup of instruments at SAPHIR



Short [description](#) of the experiment

Events

Workshop

Workshop on the Results of the Intercomparison of OVOC Measurements

June 20 - 22, 2005, Research Center Jülich, Germany

Progress Report 2007

Data of the OVOC intercomparison campaign is still discussed between the participating groups and the referee. Therefore only a confidential internal report is available at the present time.

A draft manuscript for publication has been prepared by the referee and distributed among the participants. At present the manuscript is in discussion among the participating groups and it is expected to submit the papers in the course of this year.

For any further information please get in touch with [✉ Robert Wegener](mailto:Robert.Wegener).

ACCENT OVOC Intercomparison

January 24 - 28, 2005

SAPHIR, Research Center Jülich, Germany

12 participating institutes

FZJ, FZK-IFU, IfT, University of Bremen (Germany)

CEAM (Spain)

Universities of Bristol, York, Leicester (UK)

NILU (Norway)

FAL Agroscope, EMPA (Switzerland)

Referee: Eric Apel, NCAR, USA

ACCENT OVOC Intercomparison

List of intercompared compounds:

formaldehyde, acetaldehyde

butanal, hexanal

methanol, ethanol

1-propanol, 1-butanol

methacrolein, methyl vinyl ketone

acetic acid methyl ester

acetone, benzaldehyde

2-methyl-3-buten-2-ol

n-butane and toluene

as tracers for dilution

processes in SAPHIR

and as reference compounds

for gas chromatography

ACCENT OVOC Intercomparison

Schedule:

Day #1:

Experiment 1A: Blank measurement, dry synthetic air

Experiment 1B: Blank measurement, synthetic air +
water

Experiment 1B: Blank measurement, dry synthetic air +
water + ozone

Day #2:

Experiments 2A-C: OVOC in dry synthetic air

3 different ranges of mixing ratios

Schedule:

Day #3:

Experiments 3A-C: OVOC in synthetic air + water

3 different ranges of mixing ratios

Day #4:

Experiments 4A-C: OVOC in synthetic air + water + ozone

3 different ranges of mixing ratios

Day #4:

Experiment 5A: ambient air

Experiment 5B: ambient air + OVOC