

## **Bergische Universität Wuppertal, Wuppertal, Germany (BUW)**

### **Expertise and Experience**

The Physical Chemistry Department of the Bergische Universität Wuppertal, headed until 2001 by Prof. Dr. K.H. Becker for over 20 years (new head of the institute: Prof. Dr. Th. Benter) has specialist knowledge in the investigation of atmospheric gas-phase photo-oxidation processes. The institute operates a number of indoor photoreactors of different sizes equipped with a large variety of analytical devices. Recently, the activities of the department have been considerably extended to include the investigation of atmospherically relevant heterogeneous reactions, modelling and field measurements. Accordingly, the organisation avails of staff processing expertise in all of these areas. The organisation was heavily involved in the building of the EUPHORE photoreactor in Valencia, Spain and presently assists in the maintenance and running of the facility. The department has coordinated the German tropospheric ozone research program TFS-LT3 and was instrumental in the organisation of the BERLIOZ field campaign in Berlin in the summer of 1998. The Department has participated successfully and contributed substantially to a high number of EC funded research projects (Environment, Growth and Brite-Euram programmes).

### **Professional Experience**

**Prof. Dr. Peter Wiesen** (PI) is senior research scientist of the Physical Chemistry Department of the Bergische Universität Wuppertal and has more than 15 years experience in the field of physical chemistry. His major research fields are: (i) relative kinetic measurements and product analysis of atmospheric processes in medium sized photoreactors using in situ long-path absorption spectroscopy for analysis (path length in the IR up to 1 km, detection range: sub-ppb), (ii) measurements of trace gas ( $N_2O$ ,  $CH_4$ , selected hydrocarbons) emissions from different combustion sources (household burners, power stations, automobiles and jet engines of aircrafts) and (iii) studies of heterogeneous processes at ambient temperatures and at low temperatures ( $< -80$  °C). In recent years, research students under his supervision have participated successfully and contributed substantially to several EC funded research projects. His work has resulted in more than 60 publications in peer-reviewed journals. The PI is reviewer for several scientific journals and several scientific programs.

### **RECENT/CURRENT EC PROJECTS**

AEROJET2	Non-intrusive measurements of aircraft engine exhaust emissions (BRPR-CT98-0618)
ARTEMIS	Assessment of road transport emission models and inventory systems (G2RD-CT-1999-10429)
DIFUSO	Diesel fuel and soot: Fuel formulation and its atmospheric implications (ENV4-CT97-0390), coordinator
DOMAC	DMS: Oxidation mechanisms in relation to aerosols and climate (ENV4-CT97-0410)
ELCID	Evaluation of the climate impact of DMS (EVK2-CT-1999-00033)
EUPHORAM	In situ EUPHORE radical measurement (ENV4-CT95-0011), coordinator
EUPHORE	The European Photoreactor (EV5V-CT92-0059), coordinator

EUROSOLV	Reduction of tropospheric ozone formation in Europe by the employment of alternative industrial solvents (ENV4-CT97-0414)
EXACT	Effects of the oxidation of aromatic compounds in the troposphere (EVK2-CT-1999-00053)
IALSI	Processes relevant to global change – Improvements and access to a large Simulation Chamber (EVR1-CT-2001-40013)
MOST	Multiphase chemistry of oxygenated species in the troposphere (EVK2-CT-2001-00114)
NITROCAT	Nitrous acid and its influence on the oxidation capacity of the atmosphere (EVK2-CT-1999-00025), coordinator
OSOA	Origin and formation of secondary organic aerosol (EVK2-1999-00016)
PARTEMIS	Measurement and prediction of emissions of aerosols and gaseous precursors from gas turbine engines (GRD1-1999-10891)
SAMPLER	Sampling device for the measurement of peroxy radicals in atmospheric systems (ENV4-CT97-0389), coordinator

## RECENT PUBLICATIONS

- Becker, K.H., Lörzer, J.C., Kurtenbach, R., Wiesen, P., Jensen, T., Wallington, T.J. (2000) Contribution of vehicle exhaust to the global N<sub>2</sub>O budget, *Chemosphere: Global Change Sci.* **2**, 387-395.
- Bröske, R., Kleffmann, J., Wiesen, P. (2003) Heterogeneous conversion of NO<sub>2</sub> on secondary organic aerosol surfaces: A possible source of nitrous acid (HONO) in the atmosphere?, *Atmos. Chem. Phys.* (in press).
- Cavalli, F., Geiger, H., Barnes, I., Becker, K.H. (2002) FT-IR kinetic, product and modeling study of the OH-initiated oxidation of 1-butanol, *Environ. Sci. Technol.* **36**, 1263-1270.
- Geiger, H., Becker, K.H., Wiesen, P. (2003) Effect of gasoline formulation on the formation of photo-smog: A box model study, *J. Air & Waste Manag. Assoc.* (in press).
- Geiger, H., Barnes, I., Bejan, I., Benter, Th. Spittler, M. (2003) The tropospheric degradation of isoprene: An updated module for the regional atmospheric chemistry mechanism (RACM), *Atmos. Environ.* **37**, 1503-1519.
- Geiger, H., Kleffmann, J., Wiesen, P. (2002) Smog chamber studies on the influence of diesel exhaust on photo-smog formation, *Atmos. Environ.* **36**, 1737-1747.
- Kleffmann, J., Heland, J., Kurtenbach, R., Lörzer, J.C., Wiesen, P. (2002) A new instrument (LOPAP) for the detection of nitrous acid (HONO), *Environ. Sci. Poll. Res. Int.* **9**, Special Issue 4, 48-54.
- Kleffmann, J., Becker, K.H., Bröske, R., Rothe, D., Wiesen, P. (2000) Solubility of HBr in H<sub>2</sub>SO<sub>4</sub>/H<sub>2</sub>O and HNO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub>/H<sub>2</sub>O solutions, *J. Phys. Chem.* **104**, 8489-8495.
- Siese, M., Becker, K.H., Brockmann, K.J., Geiger, H., Hofzumahaus, A., Holland, F., Mihelcic, D., Wirtz, K. (2001) Direct measurements of OH radicals from the ozonolysis of selected alkenes: A EUPHORE simulation chamber study, *Environ. Sci. Technol.* **35**, 4660-4667.