TROPOS
Leibniz Institute for Tropospheric Research

Atmospheric Chemistry

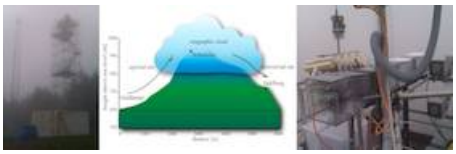
Our research intends to understand the tropospheric multiphase system. Model development is based on experimental work in the laboratory and in the field. Lab work utilises state-of-the-art physical and analytical chemistry methods to study gas phase, aqueous phase, organic phase, surface and, alltogether, multiphase phenomena. Field work aims to understand chemical processing and composition of tropospheric particles, clouds, fog and rain in the complex interplay of all compartments involved.

Field experiments

The chemical characterisation of anthropogenic aerosol, chemical multiphase processes and the formation and deposition of atmospheric trace gases are examined.

Chemical aerosol characterization and process studies

The chemical characterization of atmospheric particles, their sources, transportand their importance for heterogeneous and aqueous phase chemistry.



Cloud and precipitation chemistry and process studies

The physicochemical characterization of gas and particle phase before, during and after clouds, chemical interactions of cloud droplets, gas and particle phase.

Development & application of new instruments for atmosphere-chemical field measurements especially at the research station Melpitz

Since 1992, Melpitz is a research station for continuously characterized meteorologically and physico-chemically and interdisciplinary field campaigns.

Emissions, gas phase analysis & process studies

The advancement of the analytic equipment and methods as well as the extension of the substance spectrum.

Lab experiments

Heterogeneous, gas-phase and homogeneous aqueous phase processes, particle modifications in an aerosol chamber and the nucleation in a flow tube are realised.

Laboratory investigations on particle formation and early growth

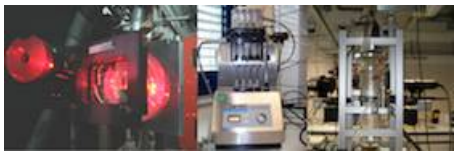
Investigation of nucleation from the reaction OH + SO2 under near-atmospheric conditions, NH3. and organic substances

Aerosol chamber experiments

Secondary organic aerosol via ozonolysis of biogenic hydrocarbons and OH radical initiated reaction of aromatic compounds.

Gas-phase reactions of OH radicals and Criegee Intermediates

Oxidative degradation reactions of important organic compounds (benzene, butadiene, isoprene, alpha-pinene) aere studied mechanistically.



Photochemical reactions in aqueous phase and phase transfers

Investigation of oxidation reactions of functionalized hydrocarbons in aqueous solution and phase transfer.

Multiphase Modeling

Multiphase Modelling

Based on lab and field experiments chemical mechanisms are formulated and modelled as well as different modules developed for improving higher scale models.

Leibniz-Institut für
Troposphärenforschung e.V. (TROPOS)
Permoserstraße 15
04318 Leipzig

Phone: ++49 (341) 2717 7060
Fax: ++49 (341) 2717 99 7060
Follow us on Twitter:
@TROPOS_de

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