

Geophysical Research Abstracts
Vol. 18, EGU2016-16539, 2016
EGU General Assembly 2016
© Author(s) 2016. CC Attribution 3.0 License.



Segregation in the Atmospheric Boundary Layer – A Discussion

Ralph Dlugi (1,4), Martina Berger (1,4), Michael Zelger (1,4), Andreas Hofzumahaus (2), Franz Rohrer (2), Frank Holland (2), Keding Lu (3), Anywhere Tsokankunku (4), Matthias Sörgel (4), Gerhard Kramm (5), and Nicole Mölders (6)

(1) Working Group Atmospheric Processes, Munich, Germany (rdlugi@gmx.de), (2) Research Center Jülich, IEK 8, Germany, (3) Peking University, College of Environmental Sciences and Engineering, Beijing, China, (4) Biogeochemistry Department, Max Planck Institute for Chemistry, Mainz, Germany, (5) Engineering Meteorology Consulting, Fairbanks, USA, (6) Geophysical Institute and College of Natural Sciences and Mathematics, University of Alaska Fairbanks, USA

Segregation is a well known topic in technical chemistry and means an incomplete mixing of the reactants. Incomplete mixing reduces the rate of reaction which is of utmost importance in technical chemistry but has been paid less attention in atmospheric chemistry. Different observational and modelling studies on chemical reactions in the turbulent and convective atmospheric boundary layer are analysed for the influences of segregation in the systems $NO - NO_2 - O_3$ and $OH + VOCs$ (with main focus on isoprene). Also some estimates on reactions like $HO_2 + NO$ (an important recycling mechanism for OH) will be given. Especially, different terms of the intensity of segregation I_S (correlation coefficients, standard deviations of mixing ratios) are compared and are related to characteristics of the flow regimes, such as mixing conditions and Damköhler numbers. Also influences of fluctuations of actinic fluxes are discussed which influence the mostly photo chemically driven reactions that were investigated.