

# Curriculum vitae

Ph.D. Tomi Raatikainen  
tomi.raatikainen@fmi.fi

## Education

Ph.D., University of Kuopio, 2003–2009

M.Sc., University of Kuopio, 1997–2003

## Research experience

Post-doc in Georgia Institute of Technology, School of Earth and Atmospheric Sciences: started October 2010

Researcher in Finnish Meteorological Institute, Climate Change unit: from January 2007 to September 2010

Researcher in University of Kuopio, Dept. of Physics: 2004–2006

Trainee in University of Kuopio, Department of Physics: June and July 2001 and from June 2002 to December 2003

## Research topics and tools

Developing activity coefficient models and surface tension and density parameterizations for liquid organic-electrolyte mixtures

Modeling of aerosol hygroscopic growth and cloud droplet activation by using different versions of Köhler theory and also air parcel models

Cloud droplet activation of particles containing surface active substances

Analysis of Aerosol Mass Spectrometer (AMS) data including both basic procedures and positive matrix factorization (PMF)

Analysis and closure studies of e.g. hygroscopicity, ethanol affinity, CCN activity, chemical composition, particle number size distribution and mass concentration data

Programming languages include Matlab, Fortran and Igor Pro

## Scientific monographs

T. Raatikainen: Thermodynamic modelling of multicomponent aerosols, Ph.D. thesis, Report Series in Aerosol Science, 106, 2009

T. Raatikainen: Aktiivisuuserroinmallit elektrolyytti-orgaaninen-vesi-liuoksille: soveltuvuus monikomponenttisten aerosolien kasvuominaisuuksien kuvaamiseen, M.Sc. thesis (in Finnish), University of Kuopio, Department of Physics, 2003

## Refereed publications

T. Raatikainen, P. Vaattovaara, P. Tiitta, P. Miettinen, J. Rautiainen, M. Ehn, M. Kulmala, A. Laaksonen and D. R. Worsnop: Physicochemical properties and origin of organic groups detected in boreal forest using an aerosol mass spectrometer, *Atmos. Chem. Phys.*, 10, 2063-2077, 2010

N. L. Prisle, T. Raatikainen, A. Laaksonen and M. Bilde: Surfactants in cloud droplet activation: mixed organic-inorganic particles, *Atmos. Chem. Phys.*, 10, 2063-2077, 2010

P. Tiitta, P. Miettinen, P. Vaattovaara, J. Joutsensaari, T. Petäjä, A. Virtanen, T. Raatikainen, P. Aalto, H. Portin, S. Romakkaniemi, H. Kokkola, K.E.J. Lehtinen, M. Kulmala and A. Laaksonen: Roadside aerosol study using hygroscopic, organic and volatility TDMA: Characterization and mixing state, *Atmos. Environ.*, 44, 976-986, 2010

J. L. Jimenez, M. R. Canagaratna, N. M. Donahue, A. S. H. Prevot, Q. Zhang, J. H. Kroll, P. F. DeCarlo, J. D. Allan, H. Coe, N. L. Ng, A. C. Aiken, K. S. Docherty, I. M. Ulbrich, A. P. Grieshop, A. L. Robinson, J. Duplissy, J. D. Smith, K. R. Wilson, V. A. Lanz, C. Hueglin, Y. L. Sun, J. Tian, A. Laaksonen, T. Raatikainen, J. Rautiainen, P. Vaattovaara, M. Ehn, M. Kulmala, J. M. Tomlinson, D. R. Collins, M. J. Cubison, E. J. Dunlea, J. A. Huffman, T. B. Onasch, M. R. Alfarra, P. I. Williams, K. Bower, Y. Kondo, J. Schneider, F. Drewnick, S. Borrmann, S. Weimer, K. Demerjian, D. Salcedo, L. Cottrell, R. Griffin, A. Takami, T. Miyoshi, S. Hatakeyama, A. Shimono, J. Y. Sun, Y. M. Zhang, K. Dzepina, J. R. Kimmel, D. Sueper, J. T. Jayne, S. C. Herndon, A. M. Trimborn, L. R. Williams, E. C. Wood, A. M. Middlebrook, C. E. Kolb, U. Baltensperger and D. R. Worsnop: Evolution of Organic Aerosols in the Atmosphere, *Science*, 326, 1525-1529, 2009.

N. Kivekäs, V.-M. Kerminen, T. Raatikainen, P. Vaattovaara, A. Laaksonen and H. Lihavainen: Physical and chemical characteristics of aerosol particles and cloud droplet activation during the Second Pallas Cloud Experiment (Second PaCE), *Boreal Env. Res.*, 14, 515-526, 2009

T. Raatikainen, A. Laaksonen, A.-P. Hyvärinen, J. Vanhanen, K. Hautio, H. Lihavainen, Y. Viisanen and I. Napari: Surface tensions of multicomponent aqueous electrolyte solutions: predictive models based on binary limits, *J. Phys. Chem. C.*, 112, 10428-10434, 2008

N.L. Prisle, T. Raatikainen, R. Sorjamaa, B. Svenningsson, A. Laaksonen and M. Bilde: Surfactant partitioning in cloud droplet activation: a study of C8, C10, C12 and C14 normal fatty acid sodium salts, *Tellus B*, 60, 416-431, 2008

J. Duplissy, M. Gysel, M. R. Alfarra, J. Dommen, A. Metzger, A. S. H. Prevot, E. Weingartner, A. Laaksonen, T. Raatikainen, N. Good, S. F. Turner, G. McFiggans, and U. Baltensperger: Cloud forming potential of secondary organic aerosol under near atmospheric conditions, *Geophys. Res. Lett.*, 35, L03818, 2008

H. Kokkola, R. Sorjamaa, A. Peräniemi, T. Raatikainen and A. Laaksonen: Cloud formation of particles containing humic-like substances, *Geophys. Res. Lett.*, 33, L10816, 2006

A.-P. Hyvärinen, T. Raatikainen, A. Laaksonen, Y. Viisanen and H. Lihavainen: Surface tensions and densities of H<sub>2</sub>SO<sub>4</sub> + NH<sub>3</sub> + water solutions, *Geophys. Res. Lett.*, 32, L16806, 2005

T. Raatikainen and A. Laaksonen: Application of several activity coefficient models to water-organic-electrolyte aerosols of atmospheric interest, *Atmos. Chem. Phys.*, 5, 2475-2495, 2005

A.-P. Hyvärinen, H. Lihavainen, K. Hautio, T. Raatikainen, Y. Viisanen and A. Laaksonen: Surface Tensions and Densities of Sulfuric Acid + Dimethylamine + Water Solutions, *J. Chem. Eng. Data*, 49, 917-922, 2004

R. Sorjamaa, B. Svenningsson, T. Raatikainen, S. Henning, M. Bilde and A. Laaksonen: The role of surfactants in Köhler theory reconsidered, *Atmos. Chem. Phys.*, 4, 2107-2117, 2004

## Manuscripts

T. Raatikainen and A. Laaksonen: A simplified treatment of surfactant effects on cloud drop activation, *Geosci. Model Dev. Discuss.*, 3, 1139–1159, 2010

## Conference abstracts

T. Raatikainen et al.: Physicochemical properties and origin of organic groups detected in boreal forest using an aerosol mass spectrometer. International Aerosol Conference 2010, Helsinki, Abstract 6G3, 2010

T. Raatikainen et al.: Aerosol Composition and Properties of the Organic Fraction in Hyytiälä, Finland. In: J. Smolík and C. D. O'Dowd (eds). Proceedings of the 18th International Conference for Nucleation and Atmospheric Aerosols, Prague, Czech Republic, 98-101, 2009

T. Raatikainen et al.: An AMS/TDMA study of organic aerosol properties at a Finnish background site. European Aerosol Conference 2009, Karlsruhe, Abstract T022A07, 2009

T. Raatikainen et al.: Modeling of cloud droplet activation of surfactant-salt particles. NOSA Aerosol Symposium, Oslo, Norway, 95-96, 2008

T. Raatikainen et al.: Estimating critical droplet size using experimental critical saturation ratios. European Aerosol Conference 2008, Thessaloniki, Greece, Abstract T06A009P, 2008

T. Raatikainen et al.: Aerosol composition after a clean air nucleation event in Hyytiälä, Finland. European Aerosol Conference 2007, Salzburg, Abstract T13A224, 2007

T. Raatikainen et al.: Composition of ambient aerosols during one nucleation and growth event in Hyytiälä, Finland. In: H. Vehkamäki, T. Bergman, J. Julin, M. Salonen and M. Kulmala (eds). NOSA 2006 Aerosol symposium, combined with the X Finnish National Aerosol Symposium, Finnish-Czech Aerosol Symposium, and BACCI workshop, Helsinki 8.-10.11.2006, 302-305, 2006

T. Raatikainen et al.: Surface tensions of organic bases, inorganic acids and their salts. In: M. Kulmala, A. Lindroth and T.M. Ruuskanen (eds). Proceedings of BACCI, NECC and FCoE activities 2005, Book B, 481-484, 2006

T. Raatikainen et al.: Intercomparison of cloud microphysics models with inorganic and organic compounds. Proceedings of the Second Joint BACCI Meeting in Kuopio 13.-15.6.2005, 86-88, 2005

T. Raatikainen et al.: Surface tensions and densities of water-sulphuric acid-ammonia solutions: Predictions and experimental data. In: M. Kulmala and T.M. Ruuskanen (eds). Research Unit on Physics, Chemistry and Biology of Atmospheric Composition and Climate Change: III Progress Report and Proceedings of Seminar in Pallas 29.3.-1.4.2005, 245-249, 2005

T. Raatikainen and A. Laaksonen: Activity coefficient models for thermodynamic modeling of organic-electrolyte aerosol particles. Proceedings of the First Joint BACCI Meeting in Lund 14.-15.6.2004, 93-98, 2004

T. Raatikainen: Activity coefficient models for organic-electrolyte aerosol particles. In: M. Kulmala, M. Salonen and T.M. Ruuskanen (eds). Research Unit on Physics, Chemistry and Biology of Atmospheric Composition and Climate Change: II Progress Report and Proceedings of Seminar in Helsinki 14.-16.6.2004, 241-246, 2004