

## List of Publications

### A) Peer-reviewed Journals

- A1. L. Wind, L. Hofer, A. Nagy, P. Winkler, A. Vrtala, W.W. Szymanski, "Light scattering from droplets with inclusions and the impact on optical measurement of aerosols", *J. Aerosol Sci.*, **35**, 1173, (2004).
- A2. P. M. Winkler, A. Vrtala, P. E. Wagner, M. Kulmala, K. E. J. Lehtinen, T. Vesala, "Mass and Thermal Accommodation during Gas-Liquid Condensation of Water", *Phys. Rev. Lett.* **93**, 075701-1 (2004).
- A3. P. Davidovits, D. R. Worsnop, J. T. Jayne, C. E. Kolb, P. Winkler, A. Vrtala, P. E. Wagner, M. Kulmala, K. E. J. Lehtinen, T. Vesala, M. Mozurkewich, "Mass Accommodation Coefficient of Water Vapor on Liquid Water", *Geophys. Res. Lett.* **31**, L22111 (2004).
- A4. A. Laaksonen, T. Vesala, M. Kulmala, P. M. Winkler, P. E. Wagner, "Commentary on Cloud Modelling and the Mass Accommodation Coefficient of Water", *Atmos. Chem. Phys.* **5**, 461 (2005).
- A5. A. I. Gaman, I. Napari, P. M. Winkler, H. Vehkamäki, P. E. Wagner, R. Strey, Y. Viisanen, M. Kulmala, „Homogeneous Nucleation of n-Nonane and n-Propanol Mixtures. A Comparison of Classical Nucleation Theory and Experiments", *J. Chem. Phys.*, **123**, 244502 (2005).
- A6. P. M. Winkler, A. Vrtala, R. Rudolf, P. E. Wagner, I. Riipinen, T. Vesala, K. E. J. Lehtinen, Y. Viisanen, M. Kulmala, "Condensation of Water Vapor: Experimental Determination of Mass and Thermal Accommodation Coefficients", *J. Geophys. Res.* **111**, D19202, (2006).
- A7. A. I. Hienola, P. M. Winkler, P. E. Wagner, H. Vehkamäki, A. Lauri, I. Napari, M. Kulmala, „Estimation of Line Tension and Contact Angle from Heterogeneous Nucleation Experimental Data“, *J. Chem. Phys.* **126**, 094705 (2007).
- A8. M. Kulmala, G. Mordas, T. Petäjä, T. Grönholm, P. P. Aalto, H. Vehkamäki, A. I. Hienola, E. Herrmann, M. Sipilä, I. Riipinen, H. E. Manninen, K. Hämeri, F. Stratmann, M. Bilde, P. M. Winkler, W. Birmili, P. E. Wagner, "The Condensation Particle Counter Battery (CPCB): A New Tool to Investigate the Activation Properties of Nanoparticles", *J. Aerosol Sci.*, **38**, 289-304 (2007).
- A9. H. Vehkamäki, A. Määttänen, A. Lauri, M. Kulmala, P. M. Winkler, A. Vrtala, P. E. Wagner, "Heterogeneous Multicomponent Nucleation Theorems for the Analysis of Nanoclusters", *J. Chem. Phys.*, **126**, 174707 (2007).
- A10. P. M. Winkler, G. Steiner, A. Vrtala, H. Vehkamäki, M. Noppel, K. E. J. Lehtinen, G. P. Reischl, P. E. Wagner, M. Kulmala, „Heterogeneous Nucleation Experiments Bridging the Scale from Molecular Ion Clusters to Nanoparticles“, *Science*, 319, 1374-1377 (2008).

- A11. P. M. Winkler, A. Vrtala, P. E. Wagner, “Condensation Particle Counting Below 2 nm Seed Particle Diameter and the Transition from Heterogeneous to Homogeneous Nucleation”, *Atmos. Res.*, **90**, 125-131 (2008).
- A12. P. M. Winkler, A. Hienola, G. Steiner, G. Hill, A. Vrtala, G. P. Reischl, M. Kulmala, P. E. Wagner, „Effects of Seed Particle Size and Composition on Heterogeneous Nucleation of n-Nonane”, *Atmos. Res.*, **90**, 187-194 (2008).
- A13. M. Kulmala, V.-M. Kerminen, A. Laaksonen, I. Riipinen, M. Sipilä, T. M. Ruuskanen, T. Kurtén, A. Lauri, L. Sogacheva, P. Hari, J. Bäck, H. Lihavainen, K. E. J. Lehtinen, H. Hakola, Y. Viisanen, M. Bilde, B. Svenningsson, M. Lazaridis, K. Torseth, K. E. Yttri, P. Tunved, E. D. Nilsson, S. Pryor, L.-L. Sørensen, S. Larsen, U. Hörrak, P. M. Winkler, P. E. Wagner, E. Swietlicki, M.-L. Riekkola, K. Hartonen, A. Ekman, R. Krejci, A. Grini, C. Hoyle, Ø. Hov, H.-C. Hansson, “Overview of the Biosphere-Aerosol-Cloud-Climate Interactions (BACCI) Studies”, *Tellus B*, **60**, 300-317 (2008).
- A14. J. Duplissy, M. B. Enghoff, K. L. Aplin, F. Arnold, H. Aufmhoff, M. Avngaard, U. Baltensperger, T. Bondo, R. Bingham, K. Carslaw, J. Curtius, A. David, B. Fastrup, S. Gagné, F. Hahn, R. G. Harrison, B. Kellelt, J. Kirkby, M. Kulmala, L. Laakso, A. Laaksonen, E. Lillestol, M. Lockwood, J. Mäkelä, V. Makhmutov, N. D. Marsh, T. Nieminen, A. Onnela, E. Pedersen, J. O. P. Pedersen, J. Polny, U. Reichl, J. H. Seinfeld, M. Sipilä, Y. Stozhkov, F. Stratmann, H. Svensmark, J. Svensmark, R. Veenhof, B. Verheggen, Y. Viisanen, P. E. Wagner, G. Wehrle, E. Weingartner, H. Wex, M. Wilhelmsson, and P. M. Winkler, „Results from the CERN pilot CLOUD experiment“, *Atmos. Chem. Phys.*, **10**, 1635-1647 (2010).
- A15. C. E. Kolb, R. A. Cox, J. P. D. Abbatt, M. Ammann, E. J. Davis, D. J. Donaldson, B. C. Garrett, C. George, P. T. Griffiths, D. R. Hanson, M. Kulmala, G. McFiggans, U. Poschl, I. Riipinen, M. J. Rossi, Y. Rudich, P. E. Wagner, P. M. Winkler, D. R. Worsnop, and C. D. O’Dowd, „An overview of current issues in the uptake of atmospheric trace gases by aerosols and clouds“, *Atmos. Chem. Phys.*, **10**, 10561-10605 (2010).
- A16. V.-M. Kerminen, T. Petäjä, H. E. Manninen, P. Paasonen, T. Nieminen, M. Sipilä, H. Junninen, M. Ehn, S. Gagné, L. Laakso, I. Riipinen, H. Vehkamäki, T. Kurten, I. K. Ortega, M. Dal Maso, D. Brus, A. Hyvärinen, H. Lihavainen, J. Leppä, K. E. J. Lehtinen, A. Mirme, S. Mirme, U. Hörrak, T. Berndt, F. Stratmann, W. Birmili, A. Wiedensohler, A. Metzger, J. Dommen, U. Baltensperger, A. Kiendler-Scharr, T. F. Mentel, J. Wildt, P. M. Winkler, P. E. Wagner, A. Petzold, A. Minikin, C. Plass-Dülmer, U. Pöschl, A. Laaksonen, and M. Kulmala. „Atmospheric nucleation: highlights of the EUCAARI project and future directions“, *Atmos. Chem. Phys.*, **10**, 10829-10848 (2010).

- A17. S. Schobesberger, P. M. Winkler, T. Pinterich, A. Vrtala, M. Kulmala, and P. E. Wagner, „Experiments on the temperature dependence of heterogeneous nucleation upon nm-sized NaCl and Ag particles.” *Chem. Phys. Chem.*, **11**, 3874-3882 (2010).
- A18. P. M. Winkler, G. Steiner, A. Vrtala, G. P. Reischl, M. Kulmala, and P. E. Wagner, Unary and binary heterogeneous nucleation of organic vapours on monodisperse WO<sub>x</sub> seed particles with diameters down to 1.4 nm. *Aerosol Sci. Technol.*, **45**, 493-498 (2011).
- A19. T. Pinterich, P. M. Winkler, A. Vrtala, P. E. Wagner, „Experiments on the Contact Angle of n-Propanol on Differently Prepared Silver Substrates at Various Temperatures and Implications for the Properties of Silver Nanoparticles.“, *Atmos. Res.*, **101**, 510-518 (2011).
- A20. J. Kirkby, J. Curtius, J. Almeida, E. Dunne, J. Duplissy, S. Ehrhardt, A. Franchin, S. Gagné, L. Ickes, A. Kürten, A. Kupc, A. Metzger, F. Riccobono, L. Rondo, S. Schobesberger, G. Tsagkogeorgas, D. Wimmer, A. Amorim, F. Bianchi, M. Breitenlechner, A. David, J. Dommen, A. Downard, M. Ehn, R. C. Flagan, S. Haider, A. Hansel, D. Hauser, W. Jud, H. Junninen, F. Kreissl, A. Kvashin, A. Laaksonen, K. Lehtipalo, J. Lima, E. R. Lovejoy, V. Makhmutov, S. Mathot, J. Mikkilä, P. Minginette, S. Mogo, T. Nieminen, A. Onnela, P. Pereira, T. Petäjä, R. Schnitzhofer, J. H. Seinfeld, M. Sipilä, Y. Stozhkov, F. Stratmann, A. Tome, J. Vanhanen, Y. Viisanen, A. Vrtala, P. E. Wagner, H. Walther, E. Weingartner, H. Wex, P. M. Winkler, K. S. Carslaw, D. R. Worsnop, U. Baltensperger, M. Kulmala, „Role of sulfuric acid, ammonia and galactic cosmic rays in atmospheric aerosol nucleation.“, *Nature*, **476**, 429-433 (2011).
- A21. P. M. Winkler, A. Vrtala, G. Steiner, D. Wimmer, H. Vehkamäki, K. E. J. Lehtinen, G. P. Reischl, M. Kulmala, P. E. Wagner, „Quantitative characterization of critical nanoclusters nucleated on large single molecules”, *Phys. Rev. Lett.* **108**, 085701 (2012).
- A22. L. Cappellin, T. Karl, M. Probst, O. Ismailova, P. M. Winkler, C. Soukoulis, E. Aprea, T. D. Märk, F. Gasperi, F. Biasioli, “On Quantitative Determination of Volatile Organic Compound Concentrations Using Proton-transfer-reaction-time-of-flight-mass-spectrometry”, *Environ. Sci. Technol.* **46**, 2283-2290 (2012).
- A23. P. M. Winkler, J. Ortega, T. Karl, L. Cappellin, H. R. Friedli, K. Barsanti, P. H. McMurry, J. N. Smith, "Identification of the biogenic compounds responsible for size-dependent nanoparticle growth", *Geophys. Res. Lett.* **39**, L20815 (2012).
- A24. A. Kupc, P. M. Winkler, A. Vrtala, P. E. Wagner, “Unusual temperature dependence of heterogeneous nucleation of water vapor on Ag particles”, *Aerosol Sci. Technol.* **47**, i-iv (2013).
- A25. M. Noppel, H. Vehkamäki, P. M. Winkler, M. Kulmala, P. E. Wagner, “Heterogeneous nucleation in multi-component vapor on a partially wettable charged conducting seed particle. I. Formulation of general equations: Electrical surface and line excess quantities”, *J. Chem. Phys.* **139**, 134107 (2013).

- A26. M. Noppel, H. Vehkamäki, P. M. Winkler, M. Kulmala, P. E. Wagner, “Heterogeneous nucleation in multi-component vapor on a partially wettable charged conducting seed particle. II. The generalized Laplace, Gibbs-Kelvin, and Young equations and application to nucleation”, *J. Chem. Phys.* **139**, 134108 (2013).
- A27. E. J. T. Levin, A. J. Prenni, B. B. Palm, D. A. Day, P. Campuzano-Jost, P. M. Winkler, S. M. Kreidenweis, P. J. DeMott, J. L. Jimenez, J. N. Smith, “Size-resolved aerosol composition and its link to hygroscopicity at a forested site in Colorado”, *Atmos. Chem. Phys.* **14**, 2657-2667 (2014).
- A28. Y. Y. Cui, A. Hodzic, J. N. Smith, J. Ortega, J. Brioude, H. Matsui, E. J. T. Levin, A. Turnipseed, P. Winkler, B. de Foy, “Modeling ultrafine particle growth at a pine forest site influenced by anthropogenic pollution during BEACHON-RoMBAS-2011”, *Atmos. Chem. Phys.* **14**, 11011-11029 (2014).
- A29. A. Kürten, T. Jokinen, M. Simon, M. Sipilä, N. Sarnela, H. Junninen, A. Adamov, J. Almeida, A. Amorim, F. Bianchi, M. Breitenlechner, J. Dommen, N. M. Donahue, J. Duplissy, S. Ehrhart, R. C. Flagan, A. Franchin, J. Hakala, A. Hansel, M. Heinritzi, M. Hutterli, J. Kangasluoma, J. Kirkby, A. Laaksonen, K. Lehtipalo, M. Leiminger, V. Makhmutov, S. Mathot, A. Onnela, T. Petäjä, A. P. Praplan, F. Riccobono, M. P. Rissanen, L. Rondo, S. Schobesberger, J. H. Seinfeld, G. Steiner, A. Tomée, J. Tröstl, P. M. Winkler, C. Williamson, D. Wimmer, P. Ye, U. Baltensperger, K. S. Carslaw, M. Kulmala, D. R. Worsnop, J. Curtius, “Neutral molecular cluster formation of sulfuric acid-dimethylamine observed in real time under atmospheric conditions”, *Proc. Natl. Acad. Sci.* **111**, 15019-15024 (2014).
- A30. J. L. Fry, D. C. Draper, K. C. Barsanti, J. N. Smith, J. Ortega, P. M. Winkler, M. J. Lawler, S. S. Brown, P. M. Edwards, R. C. Cohen, L. Lee, “Secondary organic aerosol formation and organic nitrate yield from NO<sub>3</sub> oxidation of biogenic hydrocarbons”, *Environ. Sci. Technol.* **48**, 11944-11953 (2014).
- A31. J. Julin, P. M. Winkler, N. M. Donahue, P. E. Wagner, I. Riipinen, “Near-unity mass accommodation coefficient of organic molecules of varying structure”, *Environ. Sci. Technol.* **48**, 12083-12089 (2014).
- A32. F. Bianchi, A. P. Praplan, N. Sarnela, J. Dommen, A. Kürten, I. K. Ortega, S. Schobesberger, H. Junninen, M. Simon, J. Tröstl, T. Jokinen, M. Sipilä, A. Adamov, A. Amorim, J. Almeida, M. Breitenlechner, J. Duplissy, S. Ehrhart, R. C. Flagan, A. Franchin, J. Hakala, A. Hansel, M. Heinritzi, J. Kangasluoma, H. Keskinen, J. Kim, J. Kirkby, A. Laaksonen, M. J. Lawler, K. Lehtipalo, M. Leiminger, V. Makhmutov, S. Mathot, A. Onnela, T. Petäjä, F. Riccobono, M. P. Rissanen, L. Rondo, A. Tomé, A. Virtanen, Y. Viisanen, C. Williamson, D. Wimmer, P. M. Winkler, P. Ye, J. Curtius, M. Kulmala, D. R. Worsnop, N. M. Donahue, U. Baltensperger, “Insight into acid-base nucleation experiments by comparison of the chemical composition of positive, negative and neutral clusters”, *Environ. Sci. Technol.* **48**, 13675-13684 (2014).

- A33. A. P. Praplan, S. Schobesberger, F. Bianchi, M. P. Rissanen, M. Ehn, T. Jokinen, H. Junninen, A. Adamov, A. Amorim, J. Dommen, J. Duplissy, J. Hakala, A. Hansel, M. Heinritzi, J. Kangasluoma, J. Kirkby, M. Krapf, A. Kürten, K. Lehtipalo, F. Riccobono, L. Rondo, N. Sarnela, M. Simon, A. Tomé, J. Tröstl, P. M. Winkler, C. Williamson, P. Ye, J. Curtius, U. Baltensperger, N. M. Donahue, M. Kulmala, D. R. Worsnop, “Elemental composition and clustering behaviour of  $\alpha$ -pinene oxidation products for different oxidation conditions”, *Atmos. Chem. Phys.* **15**, 4145-4159 (2015).
- A34. J. Kim, L. Ahlm, T. Yli-Juuti, M. Lawler, H. Keskinen, J. Tröstl, S. Schobesberger, J. Duplissy, A. Amorim, F. Bianchi, N. M. Donahue, R. C. Flagan, J. Hakala, M. Heinritzi, T. Jokinen, A. Kürten, A. Laaksonen, K. Lehtipalo, P. Miettinen, T. Petäjä, M. P. Rissanen, L. Rondo, K. Sengupta, M. Simon, A. Tome, C. Williamson, D. Wimmer, P. M. Winkler, S. Ehrhart, P. Ye, J. Kirkby, J. Curtius, U. Baltensperger, M. Kulmala, K. E. J. Lehtinen, J. N. Smith, I. Riipinen, A. Virtanen, “Hygroscopicity of nanoparticles produced from homogeneous nucleation in the CLOUD experiment”, *Atmos. Chem. Phys.* **16**, 293-304 (2016).
- A35. C. R. Hoyle, C. Fuchs, E. Järvinen, H. Saathoff, A. Dias, I. El Haddad, M. Gysel, S. C. Coburn, J. Tröstl, A.-K. Bernhammer, F. Bianchi, M. Breitenlechner, J. C. Corbin, J. Craven, N. M. Donahue, J. Duplissy, S. Ehrhart, C. Frege, H. Gordon, N. Höppel, M. Heinritzi, T. B. Kristensen, U. Molteni, L. Nichman, T. Pinterich, A. S. H. Prevot, M. Simon, J. G. Slowik, G. Steiner, A. Tomée, A. L. Vogel, R. Volkamer, A. C. Wagner, R. Wagner, A. S. Wexler, C. Williamson, P. M. Winkler, C. Yan, A. Amorim, J. Dommen, J. Curtius, M. W. Gallagher, R. C. Flagan, A. Hansel, J. Kirkby, M. Kulmala, O. Möhler, F. Stratmann, D. R. Worsnop, U. Baltensperger, “Aqueous phase oxidation of sulphur dioxide by ozone in cloud droplets”, *Atmos. Chem. Phys.* **16**, 1693-1712 (2016).
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- A37. T. Petäjä, E. O’Connor, D. Moiseev, V. Sinclair, A. Manninen, R. Väänänen, A. von Lerber, J. Thornton, K. Nicoll, W. Petersen, V. Chandrasekar, J. Smith, P. Winkler, O. Krüger, H. Hakola, H. Timonen, D. Brus, T. Laurila, E. Asmi, M. Riekkola, J. Mona, P. Massoli, R. Engelmann, M. Komppula, J. Wang, C. Kuang, J. Bäck, A. Virtanen, J. Levula, M. Ritsche, N.

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- A38. P. M. Winkler, R. L. McGraw, P. S. Bauer, C. Rentenberger, P. E. Wagner, „Direct determination of three-phase contact line properties on nearly molecular scale“, *Sci. Rep.* **6**, 26111 (2016).
- A39. K. Lehtipalo, L. Rondo, J. Kontkanen, S. Schobesberger, T. Jokinen, N. Sarnela, A. Kürten, S. Ehrhart, A. Franchin, T. Nieminen, F. Riccobono, M. Sipilä, T. Yli-Juuti, J. Duplissy, A. Adamov, L. Ahlm, J. Almeida, A. Amorim, F. Bianchi, M. Breitenlechner, J. Dommen, A. J. Downard, E. M. Dunne, R. C. Flagan, R. Guida, J. Hakala, A. Hansel, W. Jud, J. Kangasluoma, V.-M. Kerminen, H. Keskinen, J. Kim, J. Kirkby, A. Kupc, O. Kupiainen-Määttä, A. Laaksonen, M. J. Lawler, M. Leiminger, S. Mathot, T. Olenius, I. K. Ortega, A. Onnela, T. Petäjä, A. Praplan, M. P. Rissanen, T. Ruuskanen, F. D. Santos, S. Schallhart, R. Schnitzhofer, M. Simon, J. N. Smith, J. Tröstl, G. Tsagkogeorgas, A. Tome, P. Vaattovaara, H. Vehkamäki, A. E. Vrtala, P. E. Wagner, C. Williamson, D. Wimmer, P. M. Winkler, A. Virtanen, N. M. Donahue, K. S. Carslaw, U. Baltensperger, I. Riipinen, J. Curtius, D. R. Worsnop, M. Kulmala, "The effect of acid-base clustering and ions on the growth of atmospheric nanoparticles", *Nat. Commun.* **7**, 11594 (2016).
- A40. J. Kirkby, J. Duplissy, K. Sengupta, C. Frege, H. Gordon, C. Williamson, M. Heinritzi, M. Simon, C. Yan, J. Almeida, J. Tröstl, T. Nieminen, I. K. Ortega, R. Wagner, A. Adamov, A. Amorim, A.-K. Bernhammer, F. Bianchi, M. Breitenlechner, S. Brilke, X. Chen, J. Craven, A. Dias, S. Ehrhart, R. C. Flagan, A. Franchin, C. Fuchs, R. Guida, J. Hakala, C. R. Hoyle, T. Jokinen, H. Junninen, J. Kangasluoma, J. Kim, M. Krapf, A. Kürten, A. Laaksonen, K. Lehtipalo, V. Makhmutov, S. Mathot, U. Molteni, A. Onnela, O. Peräkylä, F. Piel, T. Petäjä, A. P. Praplan, K. Pringle, A. Rap, N. A. D. Richards, I. Riipinen, M. P. Rissanen, L. Rondo, N. Sarnela, S. Schobesberger, C. E. Scott, J. H. Seinfeld, M. Sipilä, G. Steiner, Y. Stozhkov, F. Stratmann, A. Tomé, A. Virtanen, A. L. Vogel, A. C. Wagner, P. E. Wagner, E. Weingartner, D. Wimmer, P. M. Winkler, P. Ye, X. Zhang, A. Hansel, J. Dommen, N. M. Donahue, D. R. Worsnop, U. Baltensperger, M. Kulmala, K. S. Carslaw, J. Curtius, "Ion-induced nucleation of pure biogenic particles", *Nature* **533**, 521-526 (2016).
- A41. J. Tröstl, W. K. Chuang, H. Gordon, M. Heinritzi, C. Yan, U. Molteni, L. Ahlm, C. Frege, F. Bianchi, R. Wagner, M. Simon, K. Lehtipalo, C. Williamson, J. S. Craven, J. Duplissy, A. Adamov, J. Almeida, A.-K. Bernhammer, M. Breitenlechner, S. Brilke, A. Dias, S. Ehrhart, R. C. Flagan, A. Franchin, C. Fuchs, R. Guida, M. Gysel, A. Hansel, C. R. Hoyle, T. Jokinen, H. Junninen, J. Kangasluoma, H. Keskinen, J. Kim, M. Krapf, A. Kürten, A. Laaksonen, M. Lawler, M. Leiminger, S. Mathot, O. Möhler, T. Nieminen, A. Onnela, T. Petäjä, F. M. Piel, P. Miettinen, M. P. Rissanen, L. Rondo, N. Sarnela, S. Schobesberger, K. Sengupta, M. Sipilä, J. N. Smith, G. Steiner, A. Tomé, A. Virtanen, A. C. Wagner, E. Weingartner, D. Wimmer, P.

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## **B) Conference Proceedings**

- B1. P. Winkler, A. Vrtala, P. E. Wagner, "Measurement of Vapor Uptake Via Aerosol Droplet Growth Experiments", in *Proceedings of the Mass Accommodation Workshop* (ed. by P. Davidovits, C. Kolb, M. Kulmala, D. Worsnop) p. 4. Billerica/Boston (2002).
- B2. P. M. Winkler, P. E. Wagner, M. Kulmala, I. Napari, H. Kokkola, A. Laaksonen, "Nucleation and Growth Processes in Binary Water - Ammonia Vapor Mixtures", *Report Series Aerosol Sci.* **59**, 132 (2003).
- B3. P. M. Winkler, P. E. Wagner, "Experimental Study on the Influence of Ammonia on Heterogeneous Nucleation of Water Vapor on Nanoparticles", *Abstracts of the European Aerosol Conference 2003. J. Aerosol Sci.*, p. S1067 (2003).
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