

Literaturverzeichnis

- [1] *Handbuch des Diodenlasers von EOSI, Modell 2010.*
- [2] R. W. Adams and H. D. Downing. Infrared Optical Constants of a ternary system of 75 % H₂SO₄ , 10 % HNO₃ , and 15 % H₂O. *J. Opt. Soc. Am. A*, 3(1):22–28, 1995.
- [3] S. E. Anthony, R. Tisdale, R. Disselkamp, M. A. Tolbert, and J. C. Wilson. FTIR studies of low temperature sulfuric acid aerosols. *Geophys. Res. Lett.*, 22(8):917–920, 1995.
- [4] R. L. Armstrong. Aerosol heating and vaporization by pulsed light beams. *Appl. Opt.*, 23(1):148–155, 1984.
- [5] S. Arnold, E. K. Murphy, and G. Sageev. Aerosol particle molecular spectroscopy. *Appl. Opt.*, 24(7):1048–1053, 1985.
- [6] S. Arnold, M. Neumann, and A. B. Pluchino. Molecular spectroscopy of a single aerosol particle. *Opt. Lett.*, 9(1):4–6, 1984.
- [7] S. Arnold and A. B. Pluchino. Infrared spectrum of a single aerosol particle by photothermal modulation of structure resonances. *Appl. Opt.*, 21(23):4194–4196, 1982.
- [8] A. Ashkin and J. M. Dziedzic. Observation of optical resonances of dielectric spheres by light scattering. *Appl. Opt.*, 20(10):1803–1814, 1981.
- [9] P. W. Atkins. *Physikalische Chemie*. VCH Verlagsgesellschaft Weinheim mbH, 1988.
- [10] P. Beichert and B. J. Finlayson-Pitts. Knudsen Cell Studies of the Uptake of Gaseous HNO₃ and Other Oxides of Nitrogen on Solid NaCl: The Role of Surface-Adsorbed Water. *Phys. Chem. A*, 100(5):15218–15228, 1996.
- [11] A. K. Bertram, D. D. Patterson, and J. J. Sloan. Mechanisms and temperatures for the freezing of sulfuric acid aerosols measured by FTIR extinction spectroscopy. *J. Phys. Chem.*, 100:2376–2383, 1996.

- [12] A. K. Bertram and J. J. Sloan. Temperature dependent nucleation rate constants and freezing behavior of submicron nitric acid dihydrate aerosol particles under stratospheric conditions. *J. Geophys. Res.*, 103(D3):3553 – 3561, 1998.
- [13] U. Biermann et al. Absorption Spectra and Optical Constants of Binary and Ternary Solutions of H_2SO_4 , HNO_3 and H_2O in the Mid Infrared at Atmospheric Temperatures. *J. Phys. Chem. A.*, 104:783–793, 1996.
- [14] C. F. Bohren and D. R. Huffman. *Absorption and Scattering of Light by Small Particles*. Wiley Interscience, 1983.
- [15] M. Born and E. Wolf. *Principles of Optics*. Pergamon Press, 2. edition, 1964.
- [16] Bruker Analytik GmbH. *Vektor 22, Benutzer Handbuch*, 1996.
- [17] U. Busolt. Winkelaufgelöste Beobachtung der Mie-Streuung an einzelnen Mikropartikeln, Diplomarbeit, 1995.
- [18] C. K. Chan, Z. Ha, and M. Choi. Studies of water activities of aerosols of mixtures of sodium and magnesium salts. *Atmospheric Environment*, 34:4795–4803, 2000.
- [19] R. K. Chang and A. J. Campillo. *Optical Processes in microcavities*. World Scientific, 1996.
- [20] M. L. Clapp, R. F. Niedziela, L. J. Richwine, T. Dransfield, R. E. Miller, and D. R. Worsnop. Infrared spectroscopy of sulfuric acid/water aerosols: Freezing characteristics. *J. Geophys. Res.*, 102(D7):8899 – 8907, 1997.
- [21] M. L. Clapp, D. R. Worsnop, and R. E. Miller. Frequency dependent optical constants of water ice obtained directly by aerosol extinction spectra. *J. Phys. Chem.*, 99:6317–6326, 1995.
- [22] M. D. Cohen, R. C. Flagan, and J. H. Seinfeld. Studies of Concentrated Electrolyte Solutions Using the Electrodynamic Balance. 2. Water Activities for Mixed-Electrolyte Solutions. *J. Phys. Chem.*, 91:4575–4582, 1987.
- [23] M. D. Cohen, R. C. Flagan, and J. H. Seinfeld. Studies of Concentrated Electrolyte Solutions Using the Electrodynamic Balance. 3. Solute Nucleation. *J. Phys. Chem.*, 91:4583–4590, 1987.
- [24] L. Collot, V. Lefvre-Seguin, M. Brune, J. M. Raimond, and S. Haroche. Very high-Q whispering-gallery mode resonances observed on fused silica microspheres. *Europhys. Lett.*, 23(5):327–334, 1993.

- [25] J.-J. Counieux and R. Tenu. Etude thermodynamique des equilibres solide-liquide des systemes $\text{H}_2\text{O}-\text{MCl}_2$ ($\text{M} = \text{Mg}, \text{Ca}, \text{Sr}, \text{Ba}$), I - Equation generale du liquides. *Journal de chimie physique*, 78(10):815–821, 1981.
- [26] D. J. Cziczo and J. D. Abbatt. Infrared Observations of the Response of NaCl , MgCl_2 , NH_4HSO_4 and NH_4NO_3 Aerosols to Changes in Relative Humidity from 298 to 238 K. *J. Phys. Chem. A*, 104(10):2038–2047, 2000.
- [27] D. J. Cziczo, J. B. Nowak, J. H. Hu, and J. D. Abbatt. Infrared Spectroscopy of Model Tropospheric Aerosols as a Funktion of Relative Humidity: Observation of Deliquescence and Crytallization. *J. Geophys. Res.*, 102(D15):18843–18850, 1997.
- [28] D. A. Dahl and J. E. Delmore. *Simion PC/PS2*. Idaho National Engineering Company, Idaho Falls, 1988.
- [29] E. J. Davis. A history of single aerosol particle levitation. *Aerosol Science and Technology*, 26:212–254, 1997.
- [30] W. Demtroeder. *Laserspektroskopie*. Springer Verlag, 2. edition, 1991.
- [31] F. J. Dentener and P. J. Crutzen. Reaction of N_2O_5 on tropospheric aerosols: Impact on the global distribution of NO_x , O_3 and OH. *J. Geophys. Res.*, 98(D4):7149–7163, 1993.
- [32] H. D. Downing and D. Williams. Optical Constants of Water in the Infrared. *J. Geophys. Res.*, 80(12):1656–1661, 1975.
- [33] J. Falbe and M. Regitz. *Römpp, Lexikon Chemie*. Georg Thieme Verlag, 10 edition, 1997.
- [34] K. H. Fung, D. G. Imre, and I. N. Tang. Detection limits for sulfates and nitrates in aerosol particles by Raman spectroscopy. *J. Aerosol Science*, 25(3):479–485, 1994.
- [35] K. H. Fung and I. N. Tang. Raman Scattering from single solution droplets. *Appl. Opt.*, 27(2):206, 1988.
- [36] A. Givan, A. Loewenschuss, and C. J. Nielsen. FTIR studies of annealing processes in low temperature pure and mixed amorphous ice samples. *J. Phys. Chem. B*, 101(43):8696, 1997.
- [37] J. W. Goodwin. *Colloidal Dispersions*. Royal Society of Chemistry, 1981.
- [38] G. S. Grader, S. Arnold, R. C. Flagan, and J. H. Seinfeld. Fourier transform infrared spectrometer for a single aerosol particle. *Rev. Sci. Instrum.*, 58(4):584–587, 1987.

- [39] G. S. Grader, S. Arnold, R. C. Flagan, and J. H. Seinfeld. Fourier transform infrared spectroscopy of a single levitated aerosol particle. *J. Chem. Phys.*, 86(11):5897–5903, 1987.
- [40] Z. Ha and C. K. Chan. Water activities of $MgCl_2$, $Mg(NO_3)_2$, $MgSO_4$ and their mixtures. *Aerosol Science and Technology*, 31:154–169, 1999.
- [41] D. O. Haan and B. J. Finlayson-Pitts. Knudsen Cell Studies of the Reaction of Gaseous Nitric Acid with Synthetic Sea Salt at 298 K. *J. Phys. Chem. A*, 101(51):9993–9999, 1997.
- [42] G. M. Hale and M. R. Query. Optical Constants of Water in the 200 nm to 200 μm Wavelength Region. *Appl. Opt.*, 12(3):555–563, 1973.
- [43] W. H. Hartung and C. T. Avedisian. On the electrodynamic balance. *Proc. Roy. Soc. London A*, 437:237–266, 1992.
- [44] G. Herzberg. *Molecular Spectra and Molecular Structure: II Infrared and Raman Spectra of polyatomic molecules*. D. van Nostrand Company, Inc., 1945.
- [45] J. M. Hollas. *Modern Spectroscopy*. Wiley, 3. edition, 1996.
- [46] A. F. Hollemann, E. Wiberg, and N. Wiberg. *Lehrbuch der Anorganischen Chemie*. W. de Gruyter, 101 edition, 1995.
- [47] O. Huebner. Zur Coulomb-Instabilität levitierter Mikrotröpfchen, Diplomarbeit, 1998. Diplomarbeit, Fachbereichsbibliothek Physik, FU-Berlin.
- [48] R. J. Hunter. *Foundations of Colloid Science, Vol. I*. Oxford Science Publications, Clarendon Press, Oxford, 1987.
- [49] A. L. Huston, H.-B. Lin, J. D. Eversole, and A. J. Campillo. Effect of bubble formation on microdroplet cavity quality factors. *Opt. Soc. Am.*, 13(3):521–531, 1996.
- [50] L. T. Iraci, A. M. Middlebrook, and M. A. Tolbert. Laboratory studies of the formation of polar stratospheric clouds: Nitric acid condensation on thin sulfuric acid films. *J. Geophys. Res.*, 100(D10):20969–20977, 1995.
- [51] J. D. Jackson. *Classical Electrodynamics*. Wiley Interscience, 1962.
- [52] M. Z. Jacobson. *Fundamentals of Atmospheric Modelling*. Cambridge University Press, 1. edition, 1999.
- [53] M. Kerker. *The Scattering of Light*. Academic Press, 1969.

- [54] Y. P. Kim, B. Pun, C. K. Chan, R. C. Flagan, and J. H. Seinfeld. Determination of water activity in ammonium sulfate and sulfuric acid mixtures using levitated single particles. *Aer. Sci. Tech.*, 20:275–284, 1994.
- [55] Y. P. Kim and J. H. Seinfeld. Atmospheric Gas-Aerosol Equilibrium: III. Thermodynamic of Crustal Elements Ca^{2+} , K^+ , and Mg^{2+} . *Aer. Sci. Tech.*, 22:93–100, 1995.
- [56] T. Koop, U. Biermann, W. Raber, B. P. Luo, P. J. Crutzen, and T. Peter. Do stratospheric aerosol droplets freeze above the ice frost point? *Geophys. Res. Lett.*, 22(8):917–920, 1995.
- [57] B. Krämer. Laboruntersuchungen zum Gefrierprozess in polaren stratosphärischen Wolken, Dissertation, 1998. Fachbereichsbibliothek Physik, FU-Berlin.
- [58] B. Krämer, O. Hübner, H. Vortisch, L. Wöste, T. Leisner, M. Schwell, E. Rühl, and H. Baumgärtel. Homogeneous nucleation rates of supercooled water measured in single levitated microdroplets. *J. Chem. Phys.*, 111(14):6521, 1999.
- [59] H. J. Krappe. Private Mitteilung.
- [60] U. Kreibig and M. Vollmer. *Optical Properties of Metal Clusters*. Springer, 1995.
- [61] H. Kurita, A. Takami, and S. Koda. Size reduction of gold particles in aqueous solution by pulsed laser irradiation. *Appl. Phys. Lett.*, 72(7):789–791, 1998.
- [62] Landolt and Börnstein. *Physikalische und Chemische Tabellen*.
- [63] S. Langer, R. S. Pemberton, and B. J. Finlayson-Pitts. Diffuse Reflectance Infrared Studies of the Reaction of Synthetic Sea Salt Mixtures with NO_2 : A Key Role for Hydrates in the Kinetics and Mechanisms. *Phys. Chem. A*, 101(7):1277–1286, 1997.
- [64] H.-B. Lin. Infrared absorption spectroscopy of single particles using photophoresis. *Opt. Lett.*, 10(2):68 – 70, 1985.
- [65] H.-B. Lin and A. J. Campillo. cw nonlinear optics in droplet microcavities displaying enhanced gain. *Phys. Rev. Lett.*, 73(18):2440–2443, 1994.
- [66] S. Link, C. Burda, Z. L. Wang, and M. A. El-Sayed. Electron dynamics in gold and gold-silver alloy nanoparticles: The influence of a non-equilibrium electron distribution and the size dependence of the electron-phonon relaxation. *J. Chem. Phys.*, 111(3):1255–1264, 1999.

- [67] S. Link and M. A. El-Sayed. Size and Temperature Dependence of the Plasmon Absorption of Colloidal Gold Nanoparticles. *J. Phys. Chem. B*, 103(3):4212–4217, 1999.
- [68] G. Mie. Beiträge zur Optik trüber Medien, speziell kolloidaler Metallösungen. *Annalen der Physik*, 25(3):377–455, 1908.
- [69] L. T. Molina and M. J. Molina. Production of Cl_2O_2 from the self reaction of the ClO radical. *J. Phys. Chem.*, 91, 1987.
- [70] V. Morillon, F. Debeaufort, J. Jose, J. F. Tharrault, M. Capelle, G. Blond, and A. Voilley. Water vapour pressure above saturated salt solutions at low temperatures. *Fluid Phase Equilibria*, 155:297–309, 1999.
- [71] M. Mozurkewich. Aerosol Growth and the Condensation Coefficient for Water: A review. *Aerosol Science and Technology*, 5:223–236, 1986.
- [72] J. Musick and J. Popp. Investigations of chemical reactions between single levitated magnesium chloride microdroplets with SO_2 and NO_x by means of Raman spectroscopy and elastic light scattering. *Phys. Chem. Chem. Phys.*, 1:5497–5502, 1999.
- [73] K. W. Oum, M. J. Lakin, D. O. DeHaan, T. Brauers, and B. J. Finlayson-Pitts. Formation of Molecular Chlorine from the Photolysis of Ozone and Aqueous Sea-Salt Particles. *Science*, 279:74–77, 1998.
- [74] W. Paul. Elektromagnetische Käfige für geladene und neutrale Teilchen. *Phys. Bl.*, 46(7):227–237, 1990.
- [75] C. J. Pouchert. *The Aldrich Library of Infrared Spectra*. Aldrich Chemical Company, 3 edition, 1981.
- [76] H. R. Pruppacher and J. D. Klett. *Microphysics of Clouds and Precipitation*. Kluwer Academic Publishers, 2. edition, 1997.
- [77] K. Puech, F. Z. Henari, W. J. Blau, D. Duff, and G. Schmid. Investigation of the ultrafast dephasing time of gold nanoparticles using incoherent light. *Chem. Phys. Lett.*, 247:13, 1995.
- [78] W. Roedel. *Physik unserer Umwelt: Die Atmosphäre*. Springer Verlag, Berlin, 1994.
- [79] M. Rood, M. Shaw, T. Larson, and D. Covert. Ubiquitous nature of ambient metastable aerosol. *Nature*, 337:537–539, 1989.
- [80] G. Sageev, R. Flagan, J. H. Seinfeld, and S. Arnold. Condensation Rate of Water on Aqueous Droplets in the Transition Regime. *J. Colloid and Interface Science*, 113(2):421–429, 1986.

- [81] G. Sageev and J. H. Seinfeld. Laser heating of an aqueous aerosol particle. *Appl. Opt.*, 23(23):4368–4374, 1984.
- [82] M. Schwell. Beobachtung der HCl-Gasaufnahme einzelner Schwefelsäuretröpfchen unter stratosphärischen Bedingungen, Dissertation, 1998. Fachbereichsbibliothek Physik, FU-Berlin.
- [83] M. Schwell, H. Baumgärtel, I. Weidinger, B. Krämer, H. Vortisch, L. Wöste, T. Leisner, and E. Rühl. Uptake dynamics and diffusion of HCl in Sulfuric acid solution measured in single levitated microdroplets. *J. Phys. Chem. A*, 104, 2000.
- [84] J. H. Seinfeld. *Air Pollution*. Wiley Interscience, 1986.
- [85] S. Solomon. The mystery of the antarctic ozone “hole”. *Rev. Geophys.*, 26, 1988.
- [86] S. Solomon. Progress towards a quantitative understanding of Antarctic ozone depletion. *Nature*, 347, 1990.
- [87] H. Takubo. Refractive index as a measure for saturation and supersaturation in crystal growth of water-soluble substances. *J. Cryst. Growth Vol.*, 104(2):239–244, 1990.
- [88] I. N. Tang. Thermodynamic and optical properties of mixed-salt aerosols of atmospheric importance. *J. Geophys. Res.*, 102(D2):1883–1893, 1997.
- [89] I. N. Tang and H. R. Munkelwitz. Simultaneous determination of refractive index and density of an evaporating aqueous solution droplet. *Aer. Sci. Tech.*, 15, 1991.
- [90] I. N. Tang and H. R. Munkelwitz. Water activities, densities, and refractive indices of aqueous sulfates and sodium nitrate droplets of atmospheric importance. *J. Geophys. Res.*, 99(D9):18801–18808, 1994.
- [91] R. Tenu and J.-J. Counieux. Etude thermodynamique des equilibres solide-liquide des systemes H_2O-MCl_2 ($M = Mg, Ca, Sr, Ba$), II - Calcul des diagrammes d’équilibres solide-liquide. *Journal de chimie physique*, 78(10):823–828, 1981.
- [92] R. Thurn et al. Structural resonances observed in the Raman spectra of optically levitated liquid droplets. *Appl. Opt.*, 24, 1985.
- [93] M. A. Tolbert. Sulfate aerosols and polar stratospheric cloud formation. *Science*, 264, 1994.
- [94] O. W. Toon and M. A. Tolbert. Infrared optical constants of H_2O ice, amorphous nitric acid solutions and nitric acid hydrates. *J. Geophys. Res.*, 99(D12):25631–25654, 1994.

- [95] R. D. Vold and M. J. Vold. *Colloid and Interface Chemistry*. Addison Wesley Publishing Company, 1983.
- [96] H. Vortisch. Laboruntersuchungen zum Gefrierverhalten des stratosphärischen Schwefelsäureaerosols, Diplomarbeit, 1998. Fachbereichsbibliothek Physik, FU-Berlin.
- [97] H. Vortisch, B. Krämer, I. Weidinger, L. Wöste, T. Leisner, M. Schwell, H. Baumgärtel, and E. Rühl. Homogeneous freezing nucleation rates and crystallization dynamics of single levitated sulfuric acid solution droplets. *Phys. Chem. Chem. Phys.*, 2:1407–1413, 2000.
- [98] G. Waschewsky and J. P. Abbat. *J. Phys. Chem. A*, 103:5312, 1999.
- [99] R.C. Weast and M. J. Astle. *Handbook of Chemistry and Physics*. CRC Press, 60. edition, 1979.
- [100] I. Weidinger. Untersuchungen zur HCl-Gasaufnahme levitierter H₂SO₄-Mikrotröpfchen, Diplomarbeit, 1998. Fachbereichsbibliothek Physik, FU-Berlin.
- [101] D. D. Weis and G. E. Ewing. Infrared spectroscopic signatures of (NH₄)₂SO₄ aerosols. *J. Geophys. Res.*, 101(D13):18709–18720, 1996.
- [102] W. Whitten, J. Ramsey, S. Arnold, and B. Bronk. Single-Molecule Detection Limits in Levitated Microdroplets. *Anal. Chem.*, 63:1027–1031, 1991.
- [103] R. Zhang, P. J. Wooldridge, J. P. D. Abbatt, and M. J. Molina. Physical chemistry of the H₂SO₄/H₂O binary system at low temperatures: Stratospheric implications. *J. Phys. Chem.*, 97, 1993.
- [104] M. A. Zondlo, A. B. Barone, and M. A. Tolbert. Uptake of HNO₃ on ice under upper tropospheric conditions. *Geophys. Res. Lett.*, 24(11):1391 – 1394, 1996.