# Shunsuke Nakao

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## Research Interests

Atmospheric chemistry, aerosol-cloud interaction

## Education

Ph.D. in Chemical and Environmental Engineering June 2012
University of California, Riverside (UCR)
Dissertation: Chemical and Physical Investigation of Secondary Organic Aerosol Formation
Advisor: Prof. David R. Cocker III

B.E. in Applied Chemistry April 2007
Keio University, Japan

## Professional Experiences

Clarkson University: Assistant Professor of Chemical and Biomolecular Engineering
Aug 2014 - Present

Colorado State University: NSF Atmospheric and Geospace Sciences (AGS) Postdoctoral Fellow
Aug 2012 – July 2014

University of California, Riverside: Graduate Research Assistant July 2007 – June 2012

## Honors and Awards

- Clarkson Inaugural Ignite Pilot Grant Program Competition Finalist, 2018
- NSF Atmospheric and Geospace Sciences Postdoctoral Fellowship, 2012 - 2014
- Invited participant in the Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS) XII, and the Atmospheric Chemistry Gordon Research Conference, 2013
- Global Sustainability Leadership Fellowship, School of Global Environmental Sustainability, Colorado State University, 2013
- Esther F. Hays Graduate Fellowship, 2011
- University of California Transportation Center (UCTC) Graduate Fellowship at UCR, 2008

## Research Grants

Title: Quantitative investigation of molecular tracers of primary and secondary wood smoke aerosol relevant in wintertime New York
Agency: NYSERDA Award #:59809
Time Period: 07/01/2015-09/30/2017 Amount: $252,190
Role: PI

Title: Hygroscopicity of Secondary Organic Aerosols Formed via Aqueous Reactions.
Agency: NSF Award #: AGS-PRF-1230395
Time Period: 08/01/2012 – 07/31/2014 Amount: $172,000
Role: PI

## Research Advisees

Current:

M.S.: S. Aditya Kiran (2016 - present)

Alumni:

Ph.D.: Vikram Pratap (2014 - 2018)
M.S.: Gautham Anusuya Sekar (2014 - 2016)
Undergraduates: Fabio Mitsuo Fujita (Summer 2015), Mércia Valéria de Araujo Souza Peixoto (Summer 2015), Nathanael Zakreski (Spring 2016 – Summer 2017), Vincent Li (Fall 2015 – Spring 2017), Ying Chen (*Honors thesis advisee*: Fall 2015 – Spring 2017), Rachel Hunsinger (Fall 2016 – Spring 2017), Dominic Pellegrino (Summer 2017), Trevor Thomas (*Honors thesis advisee*: Fall 2016 – Spring 2018), Gregory McMullin (Fall 2017 – Spring 2018), Ryan Carpenter (Fall 2017 – Spring 2018), Connor Malony (Spring 2018), Kayla Weckesser (Spring 2018)

## Editorial service

- Asian Journal of Atmospheric Environment (IF N/A), International Editorial Board

## Manuscript Reviewer

Publon public profile: publons.com/a/1281960/

- Environmental Science & Technology (IF 2016: 6.198)
- Atmospheric Chemistry and Physics (IF 2016: 5.318)
- Atmospheric Environment (IF 2016: 3.269)
- Environmental Chemistry (IF 2015: 2.455)
- Journal of Aerosol Science (IF 2016: 2.042)
- Atmospheric Pollution Research (IF 2016/2017: 1.637)
- Atmosphere (IF 2015: 1.221)
- Geosciences (IF N/A)
- Climate (IF N/A)
- Sustainable Environment Research (IF N/A)

## Proposal Reviewer

- DOE Atmospheric System Research Program (Panelist)
- NSF Division of Atmospheric and Geospace Sciences (Panelist)

## Professional Societies

- American Association for Aerosol Research (AAAR), member, 2008 - present
- American Geophysical Union (AGU), member, 2011 – present
- American Institute of Chemical Engineers (AIChE), 2017 - present
- American Chemical Society (ACS), member, 2011 - present
- American Society for Engineering Education (ASEE), member, 2015 – present

## Professional Service

- AIChE annual meeting, Atmospheric Chemistry and Physics, co-chair (2017, 2018)
- AAAR annual conference

- Student poster competition judge (2013, 2014, 2015, 2016, 2017)
- Education Committee, Poster vice-chair (2018)

## **Peer Reviewed Publications** (*Nakao group students shown with underlines and italics*)

Google scholar profile: goo.gl/TdL6m1

28. *Pratap, V.*, Bian, Q., *Kiran, S. A.*, Hopke, P. K., Pierce, J. R., ***Nakao, S.*** (2018). Investigation of levoglucosan decay in wood smoke smog-chamber experiments: The importance of aerosol loading, temperature, and vapor wall losses in interpreting results, Atmospheric Environment (IF: 3.63), accepted.
27. *Pratap, V.*, *Chen, Y.*, Yao, G., ***Nakao, S.*** (2018), Temperature effects on multiphase reactions of organic molecular markers: A modeling study, Atmospheric Environment (IF: 3.63), 179, 40-48.
26. ***Nakao, S.*** (2017) Why would apparent κ linearly change with O/C? Assessing the Role of Volatility, Solubility, and Surface Activity of Organic Aerosols, Aerosol Science and Technology (IF: 1.93), 51, 1377-1388.
25. Li, L., Tang, P., ***Nakao, S.***, Cocker, D. R. (2016) Impact of molecular structure on secondary organic aerosol formation from aromatic hydrocarbons photooxidation under low NOx conditions, Atmospheric Chemistry and Physics (IF: 5.11), 16, 10793-10808.
24. Clark, C. H. C., Kacarab, M., ***Nakao, S.***, Asa-Awuku, A., Sato, K., Cocker III, D. R. (2016) Temperature effects on secondary organic aerosol (SOA) from the dark ozonolysis and photo-oxidation of isoprene, Environmental Science and Technology (IF: 5.39), 50, 5564-5571.
23. Carrico, C. M., Prenni, A. J., Kreidenweis, S. M., Levin, E. J. T., McCluskey, C. S., DeMott, P. J., McMeeking, G. R., ***Nakao, S.***, Stockwell, C., Yokelson, R. J. (2016) Rapidly evolving ultra fine and fine mode biomass more physical properties: Comparing laboratory and field results, Journal of Geophysical Research (IF: 3.32), DOI: 10.1002/2015JD024389.
22. Li, L., Tang, P., ***Nakao, S.***, Kacarab, M., Cocker III, D. R. (2016) Novel approach for evaluating secondary organic aerosol from aromatic hydrocarbons: Unified method for predicting aerosol composition and formation, Environmental Science and Technology (IF: 5.39), 50, 6249-6256.
21. Levin, E. J. T., McMeeking, G. R., DeMott, P. J., McCluskey, C. S., Carrico, C. M., ***Nakao, S.***, Jayarathne, T., Stone, E. A., Stockwell, C. E., Yokelson, R. J., Kreidenweis, S. M. (2016) Ice nucleating particle emissions from biomass combustion and the potential importance of soot aerosol, Journal of Geophysical Research (IF: 3.32), DOI: 10.1002/2016JD024879.
20. Li, L., Tang, P., ***Nakao, S.***, Chen, C.-L., Cocker III, D. R. (2016) Role of methyl group number on SOA formation from aromatic hydrocarbons photooxidation under low NOx conditions, Atmospheric Chemistry and Physics (IF: 5.11), 16, 2255-2272.
19. Xu, J., Griffin, R. J., Liu, Y., ***Nakao, S.***, and Cocker III, D. R. (2015) Simulated impact of NOx on SOA formation from oxidation of toluene and m-xylene, Atmospheric Environment (IF: 3.46), 101, 217-225.
18. Jayarathne, T., Stockwell, C., Yokelson, B., ***Nakao, S.***, and Stone, E. A. (2014) Emissions of fine particle fluoride from biomass burning, Environmental Science & Technology (IF: 5.39), 48, 12636-12644.
17. McCluskey, C. S., DeMott, P. J., Prenni, A. J., Levin, E. J. T., McMeeking, G. R., Sullivan, A. P., Hill, T. C. J., ***Nakao, S.***, Carrico, C. M., and Kreidenweis, S. M. (2014) Characterization of atmospheric ice nucleating particles associated with biomass burning in the US: prescribed burns and wildfires, Journal of Geophysical Research: Atmosphere (IF: 3.32) 119, doi: 2014JD021980.

16. ***Nakao, S.***, Suda, S. R., Camp, M., Petters, M. D., and Kreidenweis, S. M. (2014) Droplet Activation of Wet Particles: Development of the Wet CCN Approach, Atmospheric Measurement and Techniques (IF: 2.99) 7, 2227-2241.
15. Clark, C. H., ***Nakao, S.***, Asa-Awuku, A., Sato, K., and Cocker III, D. R. (2013) Real-time study of particle-phase products from α-pinene ozonolysis and isoprene photo-oxidation using particle into liquid sampling directly coupled to a time of flight mass spectrometer (PILS-ToF), Aerosol Science and Technology (IF: 1.95) 47, 1374-1382.
14. ***Nakao, S.***, Tang, P., Tang, X., Clark, C., Qi, L., Heo, E., Asa-Awuku, A., Cocker III, D. R. (2013) Density and elemental ratio of secondary organic aerosol: application of a density prediction method, Atmospheric Environment (IF: 3.46) 68, 273-277.
13. Qi, L., ***Nakao, S.***, Cocker III, D. R. (2012) Aging of secondary organic aerosol from alpha-pinene ozonolysis: Roles of hydroxyl and nitrate radicals, Journal of the Air & Waste Management Association (IF: 1.61) 62, 1359-1369.
12. ***Nakao, S.***, Liu, Y., Tang, P., Chen, C.-L., Zhang, J., Cocker III, D. R. (2012) Chamber studies of SOA formation from aromatic hydrocarbons: observation of limited glyoxal uptake, Atmospheric Chemistry and Physics (IF: 5.11) 12, 3927-3937.
11. ***Nakao, S.***, Clark, C., Tang, P., Sato, K., Cocker III, D. R. (2011) Secondary Organic Aerosol formation from phenolic compounds in the absence of NOx, Atmospheric Chemistry and Physics (IF: 5.11) 11, 10649-10660.
10. Sato, K., ***Nakao, S.***, Clark, C., Qi, L., Cocker III, D. R. (2011) Secondary Organic Aerosol formation from the photooxidation of isoprene, 1,3-butadiene, and 2,3-dimethyl-1,3-butadiene under high NOx conditions, Atmospheric Chemistry and Physics (IF: 5.11) 11, 7301-7317.
9. ***Nakao, S.***, Shrivastava, M., Nguyen, A., Jung, H., Cocker III, D. R. (2011) Interpretation of secondary organic aerosol formation from diesel exhaust photooxidation in an environmental chamber, Aerosol Science and Technology (IF: 1.95) 45, 954-962.
8. Qi, L., ***Nakao, S.***, Malloy, Q., Warren, B., Cocker III, D. R. (2010) Can secondary organic aerosol formed in an atmospheric simulation chamber continuously age?, Atmospheric Environment (IF: 3.46) 44, 2990-2996.
7. Qi, L., ***Nakao, S.***, Tang, P., Cocker III, D. R. (2010) Temperature effect on physical and chemical properties of aerosols from m-xylene photooxidation, Atmospheric Chemistry and Physics (IF: 5.11) 10, 3847-3854.
6. Malloy, Q., ***Nakao, S.***, Qi, L., Austin, R., Stother, C., Hagino, H., Cocker III, D. R. (2009) Real-time aerosol density determination utilizing a modified scanning mobility particle sizer - aerosol particle mass analyzer system, Aerosol Science and Technology (IF: 1.95) 43, 673-678.
5. Shen, Z., Cao, J., Arimoto, R., Han, Z., Zhang, R., Han, Y., Liu, S., Okuda, T., ***Nakao, S.***, Tanaka, S. (2009) Ionic composition of TSP and PM2.5 during dust storms and air pollution episodes at Xi'an, China, Atmospheric Environment (IF: 3.46) 43, 2911-2918.
4. Shen, Z., Arimoto, R., Cao, J., Zhang, R., Li, X., Du, N., Okuda, T., ***Nakao, S.***, Tanaka, S. (2008) Seasonal variations and evidence for the effectiveness of pollution controls on water-soluble inorganic species in total suspended particulates and fine particulate matter from Xi'an, China, J. Air & Waste Manage. Assoc. (IF: 1.61) 58, 1560-1570.
3. Okuda, T., Katsuno, M., Naoi, D., ***Nakao, S.***, Tanaka, S., He, K., Ma, Y., Lei, Y., Jia, Y. (2008) Trends in hazardous trace metal concentrations in aerosols collected in Beijing, China from 2001 to 2006, Chemosphere (IF: 3.70) 72(6), 917-924.
2. Okuda, T., ***Nakao, S.***, Katsuno, M. Tanaka, S. (2007) Source identification of nickel in TSP and PM2.5 in Tokyo, Japan, Atmos. Environ. (IF: 3.46) 41(35), 7642-7648.

1. Okuda, T., ***Nakao, S.***, Tanaka, S., Shen, Z.X., He, K., Ma, Y., Lei, Y., Jia, Y. (2007) Characterization of water-soluble ionic composition of aerosols in Xi'an and Beijing, China, Chikyukagaku(Geochemistry) (IF: not available) 41(4), 113-123 (in Japanese with English abstract).

## Invited Seminars

5. University of California, Riverside, Department of Chemical and Environmental Engineering, 8 June 2018, Understanding the role of phase partitioning in aging of organic aerosols.
4. University of Toronto, Southern Ontario Centre for Atmospheric Aerosol Research, 6 April 2016, Bridging cloud condensation nuclei activity and volatility of oxidized organic aerosol.
3. University of Wyoming, Department of Atmospheric Science, 18 April 2014, Droplet activation of wet particles: Development of the Wet CCN approach.
2. Nagoya University, Japan, Department of Earth and Environmental Sciences, 24 July 2012.
1. National Institute for Environmental Studies, Japan, Secondary Organic Aerosol Seminar, 21 December 2011.

## Oral Presentations (*Nakao group students shown with underlines and italics*)

19. ***Nakao, S.*** (2018) Investigation of Levoglucosan Decay in Wood Smoke Smog-chamber Experiments: The Importance of Aerosol Loading, Temperature, and Vapor Wall Losses in Interpreting Results, AIChE annual meeting, Pittsburgh, PA, USA.
18. ***Nakao, S.*** (2017) Why Would Cloud Condensation Nucleus Activity Linearly Change with O/C? Assessing the Role of Volatility, Solubility, and Surface Activity of Organic Aerosols, 2017 AIChE annual meeting, Minneapolis, MN, USA.
17. ***Nakao, S.*** (2017) Why Would Apparent CCN Activity Linearly Change with O/C? Assessing the Role of Volatility, Solubility, and Surface Activity of Organic Aerosols, American Association for Aerosol Research, Raleigh, NC, USA.
16. *Pratap, V., Srikakulapu, A.*, Bian, Q., Pierce, J. R., Hopke, P. K., ***Nakao, S.*** (2017) Low Temperature Chemistry of Biomass Burning Markers, American Association for Aerosol Research, Raleigh, NC, USA.
15. Jayarathne, T., Stockwell, C., Yokelson, R. J., ***Nakao, S.***, Stone, E. (2014) Fluoride Emissions from Biomass Burning, American Association for Aerosol Research, Orlando, Fl, USA.
14. ***Nakao, S.***, Lim, Y., Turpin, B., Boris, A., Collett, J., Kreidenweis, S. (2014) The Role of Aqueous Chemistry in Cloud Formation: Impact of Oligomerization, American Association for Aerosol Research, Orlando, Fl, USA.
13. Levin, E., McMeeking, G., DeMott, P., McCluskey, C. S., Carrico, C., ***Nakao, S.***, Stockwell, C., Yokelson, R. J., Kreidenweis, S. (2014) Ice Nucleating Particle Emissions from Biomass Combustion and the Potential Importance of Soot Aerosol, American Association for Aerosol Research, Orlando, FL, USA.
12. ***Nakao, S.***, Heo, G., Warren, B., Qi, L., Hagino, H., Carter W. P. L., Cocker III, D. R. (2013) Chemical and Physical Investigation of Fractal-Like Iodine Oxide Particle Formation, 2013 AIChE Annual Meeting, San Francisco, CA, USA.
11. Tang, P., ***Nakao, S.***, Chen, C.-L., Cocker III, D. R. (2013) Secondary Organic Aerosol Formation from Aromatic Compounds: Describe SOA Yield Using [OH]/[HO2] Ratio, American Association for Aerosol Research, Portland, OR, USA.

10. ***Nakao, S.***, Kreidenweis, S., Suda, S., Petters, M. (2013) A New Experimental Approach toward Determining Cloud Nucleating Activities of Haze Particles, American Association for Aerosol Research, Portland, OR, USA.
9. McCluskey, C., DeMott, P.J., Prenni, A. J., McMeeking, G. R., Sullivan, A. P., Levin, E., ***Nakao, S.***, Carrico, C. M., Franc, G. D., Hill, T. C., Kreidenweis, S. M. (2013) The production and characteristics of ice nuclei from biomass burning in the US, European Science Foundation Atmospheric Ice Nucleation Workshop, Vienna, Austria.
8. ***Nakao, S.***, Tang, P., Clark, C., Qi, L., Seo, E., Chen, C.L., Asa-Awuku, A., Cocker III, D. R. (2012) Density and Elemental Ratios of Secondary Organic Aerosol: Application of a Density Prediction Method, American Association for Aerosol Research, Minneapolis, MN, USA.
7. ***Nakao, S.***, Liu, Y., Tang, P., Cocker III, D. R. (2011) Role of glyoxal in SOA formation from aromatic hydrocarbons, American Association for Aerosol Research, Orlando, FL, USA.
6. ***Nakao, S.***, Shrivastava, M., Nguyen, A., Qi, L., Jung, J., Cocker III, D. R. (2010) Influence of dilution and particle fractal dimension of diesel exhaust on measured SOA formation in a smog chamber, American Association for Aerosol Research, Portland, OR, USA.
5. Clark, C., ***Nakao, S.***, Sato, K., Qi, L., Asa-Awuku, A., Cocker III, D. R. (2010) Chemical characterization by particle into liquid sampling directly coupled to an accurate mass time-of-flight mass spectrometer (PILS-ToF) of secondary organic aerosol (SOA), American Association for Aerosol Research, Portland, OR, USA.
4. ***Nakao, S.***, Cocker III, D. R. (2010) Secondary Organic Aerosol (SOA) formation, 5th Annual CE-CERT- Shanghai Jiao Tong Student Symposium, Shanghai, China.
3. Qi, L., ***Nakao, S.***, Warren, B., Malloy, Q., Cocker III, D. R. (2009) Temperature effect on SOA chemical composition from select chamber reaction systems: From the perspective of a High-Resolution Aerosol Mass Spectrometer, American Association for Aerosol Research, Minneapolis, MN, USA.
2. Qi, L., ***Nakao, S.,*** Malloy, Q., Warren, B., Cocker III, D. R. (2008) Can secondary organic aerosol formed in atmospheric simulation chamber be continuously aging?, American Association for Aerosol Research, Orlando, FL, USA.
1. ***Nakao, S.***, Okuda, T., Tanaka, S., Shen, Z. X., He, K., Ma, Y., Lei, Y., Jia, Y. (2006) Observation of water-soluble ionic composition of aerosols in Xi'an China, Japan Young Geochemist Symposium, Japan.

## **Poster Presentations** (*Nakao group students shown with underlines and italics*)

23. *Kiran, A. S., Pratap, V.*, ***Nakao, S.*** (2018) Characterization of Polarity Distribution of Organic Aerosol via HPLC Coupled with Fast Aerosol Size Distribution Measurements, International Aerosol Conference, St. Louis, MO, USA.
22. *Kiran, A. S., Pratap, V.*, Bian, Q., Pierce, J. R., Hopke, P. K., ***Nakao, S.*** (2017) Temperature Dependence of Vapor Wall Deposition: A Case Study with Levoglucosan, American Association for Aerosol Research, Raleigh, NC, USA.
21. ***Nakao, S.***, *Partap, V.*, Philip Hopke (2016) Quantitative investigation of molecular tracers of wood smoke aerosol relevant in wintertime in New York State, Understanding and Reducing Residential Wood Combustion Emissions Symposium, Albany, NY, USA.
20*. *Pratap, V.*, ***Nakao, S.*** (2016) Lifetime evaluation of biomass burning markers in low temperature conditions – Effect of vapor loss in a Teflon chamber, American Association for Aerosol Research, Portland, OR, USA. [*Won a student poster award]

19. Pratap, V., ***Nakao, S.*** (2015) Multiphase chemistry of biomass burning markers and its relevance in cold regions, American Association for Aerosol Research, Minneapolis, MN, USA.
18*. Sekar, G. A., ***Nakao, S.*** (2015) Organic aerosol-sulfate interaction: Evaluation of thermodynamic effects, American Association for Aerosol Research, Minneapolis, MN, USA. [*Won a student poster award]
17. ***Nakao, S.***, Levin, E., McMeeking, G., Carrico, C., Jayarathne, T., Stone, E., Kreidenweis, S. (2014) Hygroscopicity and Cloud Condensation Nuclei Activity of Fresh Biomass Burning Aerosol: Black Carbon Mixing States, American Association for Aerosol Research, Orlando, Fl, USA.
16. Tang, P., ***Nakao, S.***, Chen, C. L., Cocker III, D. R. (2012) Secondary Organic Aerosol Formation from Aromatic Compounds: Relationship between SOA Yield and Chemical Structure, American Association for Aerosol Research, Minneapolis, MN, USA.
15. ***Nakao, S***., Heo, G., Carter W. P. L., Warren, B., Cocker III, D. R. (2011) Investigation of particle formation and ozone impacts of methyl iodide (CH3I), American Geophysical Union, San Francisco, CA, USA.
14. Liu, Y., ***Nakao, S.***, Tang, P., Cocker III, D. R., Griffin, R. J. (2011) Computational Simulation of Secondary Organic Aerosol Formation from Toluene Oxidation, American Association for Aerosol Research, Orlando, FL, USA.
13. Tang, P., ***Nakao, S.***, Qi, L., Tang, P., Cocker III, D. R. (2011) Relationships Between Chemical Structure and Secondary Organic Aerosol Formation for Aromatic Compounds, American Association for Aerosol Research, Orlando, FL, USA.
12. Clark, C., ***Nakao, S.***, Sato, K., Asa-Awuku, A., Cocker III, D. R. (2011) Temperature Dependence of Secondary Organic Aerosol Particle-Phase Products from Isoprene Dark Ozonolysis and NO Photooxidation, American Association for Aerosol Research, Orlando, FL, USA.
11. Heo, G., ***Nakao, S.***, Tang, P., Cocker III, D. R., Carter, W. P. L. (2011) Development and Evaluation of PM-SAPRC to Model Secondary Organic Aerosol Formation from Various Aromatic Compounds, American Association for Aerosol Research, Orlando, FL, USA.
10. ***Nakao, S.***, Clark, C., Tang, P., Cocker III, D. R. (2010) SOA formation from benzene, toluene, and phenolic compounds, Atmospheric Chemical Mechanisms, Davis, CA, USA.
9. ***Nakao, S.***, Tang, P., Clark, C., Sato, K., Cocker III, D. R. (2010) SOA formation from phenolic compounds, American Association for Aerosol Research, Portland, OR, USA.
8. Tang, P., ***Nakao, S.***, Tang, X., Cocker III, D. R. (2010) Secondary organic aerosol formation from the trimethylbenzene isomers, Americal Association for Aerosol Research, Portland, OR, USA.
7. ***Nakao, S.***, Qi, L., Tang, P., Sato, K., Cocker III, D. R. (2009) Secondary organic aerosol formation from m-xylene photooxidation: the role of the phenolic product, American Geophysical Union Fall meeting, San Francisco, CA, USA.
6. ***Nakao, S.***, Qi, L., Malloy, Q., Clark, C., Tang, P., Sato, K., Cocker III, D. R. (2009) Secondary organic aerosol formation from m-xylene photooxidation: Evaluation of the phenolic SOA formation route, American Association for Aerosol Research, Minneapolis, MN, USA.
5. Gookin, G., Salazar, K., Mac Kinnon, M., Willett, P., Keebaugh, A., Meacher, D., ***Nakao, S.***, Cocker III, D. R., Kleinman, M. T. (2009) Is toxicity reduced by inhalation of biodiesel-versus petroleum-diesel-fueled engine exhaust in an asthma mouse model?, UC Toxic Substances Research and Teaching Program Annual Symposium, Berkeley, CA, USA.
4. Malloy, Q.G.J., ***Nakao, S.***, Austin, R., Stothers, C., Araiza, J., Cocker III, D.R. (2009) Real-time aerosol density determination utilizing a Aerosol Particle Mass Analyzer - Scanning Mobility

Particle Sizer System, 26th Informal Symposium on Kinetic and Photochemical Processes in the Atmosphere, University of California, Riverside, USA.

3. ***Nakao, S.***, Malloy, Q., Shrivastava, M., Jung, H., Cocker III, D. R. (2009) Volatility evolution of aerosols in diesel exhaust, University of California Transportation Center Student Conference, USA.
2. Malloy, Q., ***Nakao, S.***, Cocker III, D. R. (2009) Density evolution of fresh and aged diesel exhaust, University of California Transportation Center Student Conference, USA.
1. Warren, B., Carter, W. P. L., Song, C., Malloy, Q. G. J., Qi, L., ***Nakao, S.***, Cocker III, D. R., Predicting secondary organic aerosol formation: PM-SAPRC08, American Assosiation for Aerosol Research, Orlando, FL, USA.

**Teaching Experience** (student evaluation score out of five shown in parenthesis):

Undergraduate level

- Phase Equilibria: CH270, S15 (3.5), F17, F18
- Thermodynamics & Energy Balances: CH260, F15 (3.1), F16 (4.1), S17 (3.5)
- Chemical Engineering Laboratory II – Reactor experiments: CH410, F14 (3.9)

Graduate level:

- Atmospheric Chemistry: CH576, S16 (4.8)
- Advanced Chemical Engineering Thermodynamics: CH571, S19