

EDUCATION

Ph.D. Civil Engineering The University of Texas at Austin	Aug, 2018
M.S. Environmental and Water Resources Engineering The University of Texas at Austin	June, 2014
B.S. Water Supply and Wastewater Engineering Tongji University	July, 2012

RESEARCH EXPERIENCE

Postdoctoral Associate, Virginia Tech, VA Nov, 2018-present
Advisor: Dr. Gabriel Isaacman-VanWertz. Nov, 2018 - present
Develop novel field-deployable analytical instruments (i.e. TAG-CIMS/FID/EI-MS) to provide isomer-resolved online analysis of airborne organic compounds in indoor and outdoor environments. Design and apply new techniques and software to analyze complex and large data sets. Determine the isomer-resolved chemical composition of organic aerosol through laboratory experiments and the indoor-deployment campaign.

Advisor: Dr. John Little. May, 2020 - present
Review existing building and urban sustainability assessment frameworks in the literature and summarize the knowledge gaps. Develop a general, tiered system-of-systems modeling framework, that couples relevant systems in a modular fashion through mathematical modeling, to assess sustainability across building and city scales.

Graduate Research Fellow, The University of Texas at Austin 2012-2018
Dissertation: Sorption of semi-volatile organic compounds to dust and other surfaces in indoor environments.
Advisor: Dr. Ying Xu
Study the partitioning relationship of SVOCs between air and various indoor surfaces including clothing, dust, and furniture surfaces in a residential test house. Build mass transfer models to estimate the exposure to SVOCs through multiple pathways. Collect air and dust samples in low-income homes through a field campaign to investigate the relationship between SVOC levels and childhood asthma.

TEACHING EXPERIENCE

Teaching Certificate: Graduate Certificate in Engineering Education, awarded on Aug, 2018

1. Completed 16 credits course work (five courses) related with teaching engineering and engineering education

2. Taught a graduate course under the observation of the certificate supervisor and the course professor.
3. Learned in-depth knowledge on engineering education research and philosophy on teaching.

Teaching Assistant and Instructor: Renewable Energy and Environmental Sustainability, UT Austin, 2016-2018

1. Delivered well-organized and interesting lectures on green buildings and renewable energy.
2. Organized field trips to visit energy-saving buildings.
3. Graded homework and exams.

HONORS AND AWARDS

1. **Kolodzey Travel Grant.** (to award students with top academic achievements), The University of Texas at Austin. 2018.
2. **ASHRAE Grant-In-Aid Scholarship.** (to provide research funding for highest top-rated applicant), ASHRAE. 2014.
3. **The University of Texas at Austin Graduate Research Assistantship.** 2013-2018.
4. **Klaus Toepfer Environmental Scholarship.** (to award the best 10 environmental undergraduates all over China, set up by Dr. Klaus Toepfer, former Executive Director of UNEP), IESD-UNEP, Tongji University, 2011
5. **National Scholarship.** (to award Top 1 or 2 student in one academic year), Ministry of Education, China, 2009, No.06500

PUBLICATIONS

A. Journal articles

1. **Bi, C.,** Little, C. J. Integrated assessment across building and urban scales: a review and proposal for a more holistic, multi-scale, system-of-systems approach. Submitted to *Sustainable cities and society*. In review.
2. **Bi, C.,** Krechmer, J. E., Frazier, G. O., Xu, W., Lambe, A. T., Claflin, M. S., Lerner, B. M., Jayne, J. T., Worsnop, D. R., Canagaratna, M. R., and Isaacman-VanWertz, G. Quantification of isomer-resolved iodide CIMS sensitivity and uncertainty using a voltage scanning approach. *Atmos. Meas. Tech.* 14, 6835-6850.
3. **Bi, C.,** Krechmer, J. E., Canagaratna, M. R., and Isaacman-VanWertz, G. (2021). Correcting Bias in Log-Linear Instrument Calibrations in the Context of Chemical Ionization Mass Spectrometry. *Atmos. Meas. Tech.* 14, 6551-6560.
4. **Bi, C.,** Krechmer, J. E., Frazier, G. O., Xu, W., Lambe, A. T., Claflin, M. S., Lerner, B. M., Jayne, J. T., Worsnop, D. R., Canagaratna, M. R., and Isaacman-VanWertz, G. (2021). Coupling a gas chromatograph simultaneously to a flame ionization detector and chemical ionization mass spectrometer for isomer-resolved measurements of particle-phase organic compounds, *Atmos. Meas. Tech.*, 14, 3895-3907.
5. **Bi, C.,** Wang, X., Li, H., Li, X., and Xu, Y. (2020). Direct transfer of phthalate and alternative plasticizers from indoor source products to dust: laboratory measurements and predictive modeling. *Environmental Science & Technology.* 55, 341-351.

6. **Bi, C.**, Maestre, J.P., Li, H., Zhang, G., Givehchi, R., Mahdavi, A., Kinney, K., Siegel, J., Horner, S., and Xu, Y. (2018). Phthalates and organophosphates in settled dust and HVAC filter dust of U.S. low-income homes: association with season, building characteristics, and childhood asthma, *Environmental International*, 121, 916-930.
7. **Bi, C.**, Liang, Y., and Xu, Y. (2015). Fate and transport of phthalates in indoor environments and the influence of temperature: a case study in a test house. *Environmental Science & Technology*, 49(16), 9674-9681.
8. Li, H., **Bi, C.**, Li, X., and Xu, Y. (2019). A Needle Trap Device Method for Sampling and Analysis of Semi-volatile Organic Compounds in Air, *Chemosphere*, 250, 126284.
9. Velazquez, S., **Bi, C.**, Kline, J., Nunez, S., Corsi, R., Xu, Y., Ishaq, S.L. (2019). Accumulation of di-2-ethylhexyl phthalate from polyvinyl chloride flooring into settled house dust and the effect on the bacterial community. *PeerJ*, 7, e8147
10. Liang, Y., **Bi, C.**, Wang, X., and Xu, Y. (2018). Indoor residential fate model of phthalate plasticizers, *Indoor Air*, 29(1), 55-69.
11. Wang, X., **Bi, C.**, and Xu, Y. (2015). Modeling and analysis of sampling artifacts in measurements of gas-particle partitioning of semivolatile organic contaminants using filter-sorbent samplers. *Atmospheric Environment*, 117, 99-109.
12. Givehchi, R., Maestre, J., **Bi, C.**, Wylie, D., Horner, S., Xu, Ying., Kinney, Kerry., Siegel, J. (2018). Quantitative filter forensics with residential HVAC filters to assess indoor concentrations, *Indoor Air*, 29(3), 390-402.
13. Hurley, J. F., Kreisberg, N. M., Stump, B., **Bi, C.**, Kumar, P., Hering, S. V., Keady, P., and Isaacman-VanWertz, G. (2020). A new approach for measuring the carbon and oxygen content of atmospherically relevant compounds and mixtures, *Atmos. Meas. Tech.*, 13, 4911–4925
14. Eichler, C., Cohen Hubal, E., Xu, Y., Cao, J., **Bi, C.**, Weschler, C., Salthammer, T., Morrison, G., Koivisto, A. J., Zhang, Y., Mandin, C., Wei, W., Blondeau, P., Poppendieck, D., Liu, X., Delmaar, C., Jolliet, O., Shin, H. M., Diamond, M., Shiraiwa, M., Zuend, A., Hopke, P., Fantke, P., von Goetz, N., Kulmala, M., and Little, J. (2020). Assessing human exposure to SVOCs in materials, products and articles: a modular mechanistic framework. *Environmental Science & Technology*. 55, 25-43.
15. Velazquez, S., Griffiths, W., Dietz, L., Horve, P., Nunez, S., Hu, J., Shen, J., Fretz, M., **Bi, C.**, Xu, Y., Van Den Wymelenberg, KG. (2019). From one species to another: A review on the interaction of chemistry and microbiology in relation to cleaning in the built environment. *Indoor air*. 29. 880-894

B. Conference Proceedings

1. Bi., C. Wang, C., Little, C. J. Integrated assessment across building and city scales using a system-of-systems framework. In: Proceedings of Indoor air 2020, Online conference. Nov. 2020
2. Bi, C., Krechmer, J. E., Frazier, G. O., Xu, W., Lambe, A. T., Clafin, M. S., Lerner, B. M., Jayne, J. T., Worsnop, D. R., Canagaratna, M. R., and Isaacman-VanWertz, G. Isomer-resolved quantification of particle-phase organic compounds using a coupled GC-CIMS/FID, In: Proceedings of AAAR 2020, Online conference. Oct. 2020

3. Bi, C., Frazier, G., Krechmer, J., Xu, W., Lambe, A., Claflin, M., Lerner, B., Canagaratna, M., Jayne, J., Worsnop, D., Isaacman-VanWertz, G. Isomer-resolved Chemical Characterization of the Particle-phase Oxidation Products of Indoor Emissions Using Gas Chromatography-Chemical Ionization Mass Spectrometry, In: Proceedings of AAAR 2019, Portland, USA. July. 2019
4. Bi, C., and Xu, Y. Screen-level estimation of crawling-induced exposure to particle-phase phthalates, In: Proceedings of Indoor Air 2018, Philadelphia, USA. Jul. 2018.
5. Bi, C., and Xu, Y. Direct transfer of phthalates from polyvinyl chloride flooring into house dust: a chamber study. In: Proceedings of Indoor Air 2018, Philadelphia, USA. Jul. 2018.
6. Bi, C., Maestre, J.P., Zhang, G., Kinney, K., Novoselac, A., Siegel, J., and Xu, Y. Semi-volatile organic compounds in indoor settled dust and HVAC filter dust: association with seasons, childhood asthma and building characteristics, In: Proceedings of Indoor Air 2018, Philadelphia, USA. Jul. 2018.
7. Bi, C., and Xu, Y. Phthalates uptake by settled dust on polyvinyl chloride flooring and the influence of temperature. In: Proceedings of Indoor Air 2016, Ghent, Belgium. Jul. 2016.
8. Bi, C., Maestre, J., Kinney, K., Siegel, J., Horner, S., and Xu, Y. Semi-volatile organic compounds in indoor settled and HVAC filter dust: association with seasons, childhood asthma and building characteristics. In: Proceedings of Indoor Air 2016, Ghent, Belgium. Jul. 2016.
9. Bi, C., and Xu, Y. The influence of temperature on the fate and transport of indoor phthalates: a case study in a test house. In: Proceedings of Healthy Building 2015 America, Boulder, Colorado, USA. Jul. 2015.
10. Bi, C., and Xu, Y. Fate and transport of phthalates in indoor environments and the influence of temperature: a case study in a test house. In: Proceedings of A&WMA's 108th Annual Conference & Exhibition, Raleigh, North Carolina, USA. Jun. 2015.
11. Bi, C., and Xu, Y. The influence of temperature, ventilation and humidity on the fate and transport of indoor phthalates. In: Proceedings of Indoor Air 2014, Hong Kong, China. Jul. 2014.
12. Mcglynn, D., Bi, C., Frazier, G., Pusede, S., Isaacman-VanWertz, G. Concentrations of Biogenic Volatile Organic Compound in an East Coast Forest, and Their Relative Importance for Ozone Chemical Loss. In: Proceedings of AAAR 2019, Portland, USA. July. 2019
13. Frazier, G., Bi, C., Mcglynn, D., Pusede, S., Isaacman-VanWertz, G. Biogenic Oxidation Products in a Mixed Forest: Their Concentrations, Reactivity, and Fates. In: Proceedings of AAAR 2019, Portland, USA. July. 2019
14. Li, H., Bi, C., Crain, N., Novoselac, A., Kinney, K., Corsi, R., and Xu, Y. Phthalate, organophosphates, polybrominated diphenyl ethers, pesticides, and their alternatives in indoor air and dust in U.S. high school, In: Proceedings of Indoor Air 2018, Philadelphia, USA. Jul. 2018.
15. Li, H., Bi, C., and Xu, Y. Novel rapid method for characterizing emissions of semi-volatile organic compounds from building materials and consumer products, In: Proceedings of Indoor Air 2018, Philadelphia, USA. Jul. 2018.
16. Li, H., Bi, C., Xu, Y., Crain, N., Novoselac, A., Kinney, K., Corsi, R. Phthalates, organophosphates, polybrominated diphenyl ethers, pesticides, and their alternatives in indoor air and dust in U.S. schools. In: Indoor Air 2016, Ghent, Belgium. Jul. 2016.

PROPOSAL CONTRIBUTIONS

1. Organophosphates and Phthalates in Sleep Microenvironments: Emission, Transport, and Infants' Exposure. National Science Foundation (NSF). 2015. Awarded.
2. Occupational Exposure to SVOCs from Indoor “Green” Paints. National Institute for Occupational Safety and Health (NIOSH)-Education Research Center (ERC). 2017. Awarded.
3. A Novel Botanical Air Filtration System to Reduce Organic Air Pollutants in Indoor Environments. The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). 2014. Awarded.

INVITED SEMINAR PRESENTATIONS

1. **Bi., C.** Emission and transport of semi-volatile organic compounds in buildings and the consequent exposure: a cross-scale, system-of-systems view. Invited presentation at University of Toronto. Department of Civil and Mineral Engineering. Feb. 2021

CONFERENCE ORAL PRESENTATIONS

1. **Bi, C.,** Krechmer, J. E., Canagaratna, M. R., and Isaacman-VanWertz, G. Correcting Bias in Log-Linear Instrument Calibrations in the Context of Chemical Ionization Mass Spectrometry. In: Proceedings of AAAR 2021, Online conference. Oct. 2021
2. **Bi., C.,** Wang, C., Little, C. J. Integrated assessment across building and city scales using a system-of-systems framework. In: Proceedings of Indoor air 2020, Online conference. Nov. 2020
3. **Bi, C.,** Krechmer, J. E., Frazier, G. O., Xu, W., Lambe, A. T., Claflin, M. S., Lerner, B. M., Jayne, J. T., Worsnop, D. R., Canagaratna, M. R., and Isaacman-VanWertz, G. Isomer-resolved quantification of particle-phase organic compounds using a coupled GC-CIMS/FID, In: Proceedings of AAAR 2020, Online conference. Oct. 2020
4. **Bi, C.,** Frazier, G., Krechmer, J., Xu, W., Lambe, A., Claflin, M., Lerner, B., Canagaratna, M., Jayne, J., Worsnop, D., Isaacman-VanWertz, G. Isomer-resolved Chemical Characterization of the Particle-phase Oxidation Products of Indoor Emissions Using Gas Chromatography-Chemical Ionization Mass Spectrometry, In: Proceedings of AAAR 2019, Portland, USA. July. 2019
5. **Bi, C.,** and Xu, Y. Screen-level estimation of crawling-induced exposure to particle-phase phthalates, In: Proceedings of Indoor Air 2018, Philadelphia, USA. Jul. 2018.
6. **Bi, C.,** and Xu, Y. Direct transfer of phthalates from polyvinyl chloride flooring into house dust: a chamber study. In: Proceedings of Indoor Air 2018, Philadelphia, USA. Jul. 2018.
7. **Bi, C.,** and Xu, Y. Phthalates uptake by settled dust on polyvinyl chloride flooring and the influence of temperature. In: Proceedings of Indoor Air 2016, Ghent, Belgium. Jul. 2016.
8. **Bi, C.,** Maestre, J., Kinney, K., Siegel, J., Homer, S., and Xu, Y. Semi-volatile organic compounds in indoor settled and HVAC filter dust: association with seasons, childhood asthma and building characteristics. In: Proceedings of Indoor Air 2016, Ghent, Belgium. Jul. 2016.
9. **Bi, C.,** and Xu, Y. The influence of temperature on the fate and transport of indoor phthalates: a case study in a test house. In: Proceedings of Healthy Building 2015 America, Boulder, Colorado, USA. Jul. 2015.

10. **Bi, C.**, and Xu, Y. Fate and transport of phthalates in indoor environments and the influence of temperature: a case study in a test house. In: Proceedings of A&WMA's 108th Annual Conference & Exhibition, Raleigh, North Carolina, USA. Jun. 2015.

PROFESSIONAL ACTIVITIES AND SERVICE

Membership in Professional Societies:

1. International Society of Indoor Air Quality and Climate, 2014-present.
2. American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHARE), 2014-present.
3. International Society of Exposure Science, 2017-present.