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Engineering & Scientific Consulting

## Trevor M. Lardinois, Ph.D.

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### Professional Profile

Dr. Lardinois focuses on applying the fundamentals of chemical engineering, chemistry, and material science to investigations and analyses of safety incidents involving chemical processes, fires, explosions, and consumer products. He has also studied formulations and characteristics of materials with propensities to self-heat and spontaneously combust. Dr. Lardinois has extensive experience with heterogeneous catalyst formulation, characterization, kinetics, and stability/deactivation for various applications, such as pollution control technologies for NO<sub>x</sub> (x = 1, 2) abatement in diesel engine exhaust and hydrocarbon upgrading.

Dr. Lardinois received his B.S. in Chemical Engineering from the University of Wisconsin – Madison, where he researched the upgrading of biomass derived feed stocks to value-added chemicals. After a summer sojourn to the Technical University of Vienna in Austria, Dr. Lardinois started his Ph.D. studies at Purdue University. His dissertation focused on the influence of zeolite material properties and external gas conditions on the thermodynamics and kinetics of metal structural interconversion for the abatement of NO<sub>x</sub> pollution from automotive engine exhaust. Throughout his Ph.D. studies, Dr. Lardinois worked with many advanced catalyst/material characterization instruments and frequently consulted with automotive companies.

### Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, Purdue University, 2021

B.S., Chemical and Biological Engineering, University of Wisconsin, Madison, 2016

Prof. K.C. Chao and Jiun Chao Graduate Education Endowment Grant, Purdue University, 2020

Outstanding Teaching Assistant Award (Heat and Mass Transfer), Purdue University, 2018

Ross Fellowship, Purdue University, 2016–2017

Melby Scholarship, University of Wisconsin – Madison, 2015

Gensler Scholarship, University of Wisconsin – Madison, 2015

Eugene and Patricia Kreger Herscher Scholarship, University of Wisconsin – Madison, 2014 & 2015

Engineering Great People Scholarship, University of Wisconsin – Madison, 2014

## Prior Experience

Quality and Assurance Intern, AbbVie, 2015

## Professional Affiliations

American Institute of Chemical Engineers (AIChE)

National Fire Protection Association (NFPA)

## Publications

Lardinois TM, Bates JS, Lippie HH, Russell CK, Miller JT, Meyer HM, Unocic KA, Prikhodko VY, Wei X, Lambert CK, Getsoian A, Gounder R. Structural Interconversion Between Agglomerated Palladium Domains and Mononuclear Pd(II) Cations in Chabazite Zeolites. *Chemistry of Materials*, January 2021; 33(5):1698–1713.

Shih A, Khurana I, Li H, González JM, Kumar A, Paolucci C, Lardinois TM, Jones CB, Albarracin Caballero JD, Kamasamudram K, Yezerets A, Delgass WN, Miller JT, Luz Villa A, Schneider WF, Gounder R, Ribeiro FH. Spectroscopic and kinetic responses of Cu-SSZ-13 to SO<sub>2</sub> exposure and implications for NO<sub>x</sub> selective catalytic reduction. *Applied Catalysis A*, March 2019; 574(25):122–131.

## Presentations

Lardinois TM, Lippie HH, Yadav V, Li CW, Gounder R. Effects of Pd particle size and water pressure on the structural transformation of Pd nanoparticles to mononuclear Pd(II) cations in CHA zeolites. Chicago Catalysis Club Conference (virtual), May 2021.

Lardinois TM, Bates JS, Lippie HH, Gounder R. Interconversion of agglomerated Pd domains and mononuclear Pd(II) cations in CHA zeolites. North East Corridor Zeolite Association Annual Meeting (virtual), December 2020.

Lardinois TM, Bates JS, Getsoian A, Miller JT, Gounder R. Interconversion of agglomerated Pd domains and mononuclear Pd(II) in CHA zeolites. American Institute of Chemical Engineers Annual Meeting (virtual), November 2020.

Lardinois TM, Bates JS, Getsoian A, Miller JT, Gounder R. Structural Interconversion Between Agglomerated Pd Domains and Isolated Pd<sup>2+</sup> Cations in Chabazite Zeolites. Cross-Cut Lean Exhaust Emissions Reduction Simulations (virtual), September 2020.

Lardinois TM, Bates JS, Getsoian A, Miller JT, Gounder R. Interconversion of agglomerated Pd domains ion-exchanged Pd<sup>2+</sup> in CHA zeolites." Chicago Catalysis Club Conference (virtual), August 2020.

Lardinois TM, Gounder R. Structural interconversion between agglomerated Pd domains and isolated Pd cations in chabazite zeolites. Purdue Graduate Student Symposium (virtual), August 2020.

Lardinois TM, Bates JS, Unocic KA, Choi JS, Prikhodko VY, Getsoian A, Miller JT, Gounder R. Palladium Speciation in Beta and Chabazite Zeolites for Passive NO<sub>x</sub> Adsorption. North American Catalysis Society Meeting, Chicago, IL, June 2019.

Lardinois TM, Bates JS, Unocic KA, Prikhodko VY, Getsoian A, Theis J, Lambert CK, Miller JT, Gounder R. Palladium Speciation in Zeolites for Passive NO<sub>x</sub> Adsorption. Cross-Cut Lean Exhaust Emissions Reduction Simulations, Ann Arbor, MI, September 2018.

Lardinois TM, Motagamwala AH, Dumesic J. Conversion of Ligno-cellulosic Biomass to Sugars Using

Gamma-Valeroactone. Chemical and Biological Undergraduate Research Poster Session, Madison, WI, December 2015.