

## Curriculum Vitae of Raul F. Lobo

**Address** University of Delaware  
Center for Catalytic Science and Technology  
Department of Chemical Engineering  
329 Colburn Lab., Newark, DE 19716 USA  
Phone: 302/831-1261; Fax: 302/831-2085; E-mail: lobo@udel.edu

**Personal** Born August 27, 1966  
San Jose, Costa Rica  
US Citizen  
Married (two children)

### Education

Graduate Ph.D. in Chemical Engineering (Chemistry Minor) — 1995  
California Institute of Technology, Pasadena, California  
Advisor: Prof. Mark E. Davis  
M.Sc. in Chemical Engineering — 1993  
California Institute of Technology  
Undergraduate “Licenciatura” in Chemical Engineering — 1989  
University of Costa Rica, Costa Rica

### Professional experience

Claire D. LeClaire Professor Department of Chemical and Biomolecular Engineering,  
University of Delaware — Sept. 2014 to present  
Professor Department of Chemical and Biomolecular Engineering,  
University of Delaware — Sept. 2006–2014  
Director Center for Catalytic Science and Technology, University  
of Delaware — Aug. 2012-present  
Visiting Professor Department of Chemical Engineering, University of  
California at Berkeley 2010-2011  
Associate Professor Department of Chemical Engineering — Sept. 2000–  
2006, University of Delaware  
Visiting Fellow Centre for High-Resolution Electron Microscopy, Delft  
University of Technology, The Netherlands —Sept.  
2001-May 2002.  
Visiting Professor Department of Chemical Engineering, Universidad Rey  
Juan Carlos, Madrid, Spain —July 2001  
Co-Director Center for Catalytic Science and Technology (CCST),  
1996-present  
Assistant Professor Department of Chemical Engineering — Sept. 1995–  
Aug. 2000, University of Delaware  
Postdoctoral Fellow Theoretical Chemistry and Molecular Physics Group  
Nov. 1994 to Sep. 1995

Los Alamos National Laboratory, Los Alamos, New Mexico  
Advisor: Dr. Antonio Redondo  
Graduate Research Assistant    Chemical Engineering — 1990 to 1994  
California Institute of Technology  
Undergraduate Research        Laboratory of Cellular and Molecular — 1988-1989  
Assistant                            Biology, University of Costa Rica

### **Professional Societies: Membership**

American Institute of Chemical Engineers  
American Chemical Society  
American Society for Engineering Education  
International Zeolite Association  
North American Catalysis Society  
American Association for the Advancement of Science

### **Honors and Awards**

CAREER Award for Young Investigators of the NSF, 1997  
Camille Dreyfus Teacher-Scholar, 1999  
Young Scholar of the Francis Alison Society, 1999  
Outstanding Young Faculty of the College of Engineering, 1999  
Innovation Recognition Program, The Dow Chemical Company, 2001  
Ipatieff Prize, American Chemical Society, 2004

### **Professional Service**

- Member of Editorial Board Chemistry of Materials (ACS) and ChemSusChem.
- Member of American Chemical Society, American Institute of Chemical Engineers, Philadelphia Catalysis Club, North American Catalysis Society, International Zeolite Association and AAAS.
- Member of Chemical Technology Operating Council of AIChE (2008-2011).
- Member of the Structure-Commission of the International Zeolite Association (1998-2010)
- Treasurer, International Zeolite Association (2013-2019)

## Publications

### Bibliometric Data for January 15<sup>th</sup>, 2019 (ISI Web of Knowledge)

- Times cited (no self-citations): 9012
- h-Index: 48
- Average Citations: 44

### Refereed Publications

My name is in bold in those publications resulting from work conducted at Delaware and where I am the corresponding author, or where I have made a substantial intellectual contribution. Publications 1-11 are the result of doctoral work at the California Institute of Technology.

- (1) Davis, M. E.; Lobo, R. F. "Zeolite and Molecular-Sieve Synthesis." *Chem. Mater.* **1992**, 4, 756.
- (2) Lobo, R. F.; Annen, M. J.; Davis, M. E. "Zeolite Phi - a Physical Mixture of Chabazite and Offretite." *J. Chem. Soc. - Faraday Trans.* **1992**, 88, 2791.
- (3) Lobo, R. F.; Pan, M.; Chan, I.; Li, H. X.; Medrud, R. C.; Zones, S. I.; Crozier, P. A.; Davis, M. E. "Ssz-26 and Ssz-33 - 2 Molecular-Sieves with Intersecting 10-Ring and 12-Ring Pores." *Science* **1993**, 262, 1543.
- (4) Cambor, M. A.; Lobo, R. F.; Koller, H.; Davis, M. E. "Synthesis and Characterization of Zincosilicates with the Sod Topology." *Chem. Mater.* **1994**, 6, 2193.
- (5) Lobo, R. F.; Davis, M. E. "Synthesis and characterization of pure-silica and boron-substituted SSZ-24 using N(16)methylsparteinium bromide as structure-directing agent." *Micropor. Mater.* **1994**, 3, 61.
- (6) Lobo, R. F.; Pan, M.; Chan, I.; Medrud, R. C.; Zones, S. I.; Crozier, P. A.; Davis, M. E. "Physicochemical Characterization of Zeolites Ssz-26 and Ssz-33." *J. Phys. Chem.* **1994**, 98, 12040.
- (7) Lobo, R. F.; Zones, S. I.; Davis, M. E. Effect of the Stacking Probability on the Properties of the Molecular-Sieves Cit-1, Ssz-26 and Ssz-33. In *Zeolites and Related Microporous Materials: State of the Art 1994, 1994; Vol. 84; pp 461.*
- (8) Koller, H.; Lobo, R. F.; Burkett, S. L.; Davis, M. E. "Sio-Center-Dot-Center-Dot-Center-Dot-Hosi Hydrogen-Bonds in as-Synthesized High-Silica Zeolites." *J. Phys. Chem. B.* **1995**, 99, 12588.
- (9) Lobo, R. F.; Davis, M. E. "Cit-1 - a New Molecular-Sieve with Intersecting Pores Bounded by 10-Rings and 12-Rings." *J. Am. Chem. Soc.* **1995**, 117, 3764.

- (10) Lobo, R. F.; Zones, S. I.; Davis, M. E. "Structure-Direction in Zeolite Synthesis." *J. Inc. Phen. Mol. Rec.* **1995**, *21*, 47.
- (11) Freyhardt, C. C.; Lobo, R. F.; Khodabandeh, S.; Lewis, J. E.; Tsapatsis, M.; Yoshikawa, M.; Cambor, M. A.; Pan, M.; Helmkamp, M. M.; Zones, S. I.; Davis, M. E. "VPI-8: A high-silica molecular sieve with a novel "pinwheel" building unit and its implications for the synthesis of extra-large pore molecular sieves." *J. Am. Chem. Soc.* **1996**, *118*, 7299.
- (12) Freyhardt, C. C.; Tsapatsis, M.; **Lobo, R. F.**; Balkus, K. J.; Davis, M. E. "A high-silica zeolite with a 14-tetrahedral-atom pore opening." *Nature* **1996**, *381*, 295.
- (13) **Lobo, R. F.**; Zones, S. I.; Medrud, R. C. "Synthesis and Rietveld refinement of the small-pore zeolite SSZ-16." *Chem. Mater.* **1996**, *8*, 2409.
- (14) **Lobo, R. F.**; Tsapatsis, M.; Freyhardt, C. C.; Chan, I.; Chen, C. Y.; Zones, S. I.; Davis, M. E. "A model for the structure of the large-pore zeolite SSZ-31." *J. Am. Chem. Soc.* **1997**, *119*, 3732.
- (15) **Lobo, R. F.**; Tsapatsis, M.; Freyhardt, C. C.; Khodabandeh, S.; Wagner, P.; Chen, C. Y.; Balkus, K. J.; Zones, S. I.; Davis, M. E. "Characterization of the extra-large-pore zeolite UTD-1." *J. Am. Chem. Soc.* **1997**, *119*, 8474.
- (16) Velev, O. D.; Jede, T. A.; **Lobo, R. F.**; Lenhoff, A. M. "Porous silica via colloidal crystallization." *Nature* **1997**, *389*, 447.
- (17) Feuerstein, M.; **Lobo, R. F.** "Influence of oxygen and nitrogen on Li-7 MAS NMR spectra of zeolite LiX-1.0." *Chem. Commun.* **1998**, 1647.
- (18) Feuerstein, M.; **Lobo, R. F.** "Characterization of Li cations in zeolite LiX by solid-state NMR spectroscopy and neutron diffraction." *Chem. Mater.* **1998**, *10*, 2197.
- (19) Shantz, D. F.; **Lobo, R. F.** "Spatial ordering of organic and inorganic charge centers in as-made high-silica zeolites determined by multidimensional {<sup>1</sup>H}-> <sup>2</sup>H-2 CPMAS NMR correlation spectroscopy." *Chem. Mater.* **1998**, *10*, 4015.
- (20) Shantz, D. F.; **Lobo, R. F.** "Spatial correlation of charge centers in the tectosilicate nonasil determined by multidimensional {<sup>1</sup>H}-> <sup>2</sup>H-2 CPMAS NMR correlation spectroscopy." *J. Am. Chem. Soc.* **1998**, *120*, 2482.
- (21) Shantz, D. F.; **Lobo, R. F.** "Solid-state deuterium NMR studies of organic molecules in the tectosilicate nonasil." *J. Phys. Chem. B* **1998**, *102*, 2339.
- (22) Velev, O. D.; Jede, T. A.; **Lobo, R. F.**; Lenhoff, A. M. "Microstructured porous silica obtained via colloidal crystal templates." *Chem. Mater.* **1998**, *10*, 3597.
- (23) Burton, A.; Feuerstein, M.; **Lobo, R. F.**; Chan, J. C. C. "Characterization of

- cancrinite synthesized in 1,3-butanediol by Rietveld analysis of powder neutron diffraction data and solid- state Na-23 NMR spectroscopy." *Micropor. Mesopor. Mater.* **1999**, *30*, 293.
- (24) Burton, A.; **Lobo, R. F.** "The role of barium cations in the synthesis of low-silica LTL zeolites." *Micropor. Mesopor. Mater.* **1999**, *33*, 97.
- (25) Feuerstein, M.; **Lobo, R. F.** "Mobility of Li cations in X zeolites studied by solid-state NMR spectroscopy." *Solid State Ion.* **1999**, *118*, 135.
- (26) Juttu, G. G.; **Lobo, R. F.** "Framework modification of microporous silicates via gas-phase treatment with ZrCl<sub>4</sub>." *Cat. Lett.* **1999**, *62*, 99.
- (27) Shantz, D. F.; Burton, A.; **Lobo, R. F.** "Synthesis, structure solution, and characterization of the aluminosilicate MCM-61: the first aluminosilicate clathrate with 18-membered rings." *Micropor. Mesopor. Mater.* **1999**, *31*, 61.
- (28) Shantz, D. F.; Fild, C.; Koller, H.; **Lobo, R. F.** "Guest-host interactions in As-made Al-ZSM-12: Implications for the synthesis of zeolite catalysts." *J. Phys. Chem. B* **1999**, *103*, 10858.
- (29) Shantz, D. F.; **Lobo, R. F.** "H-2-{H-1} CPMAS NMR of guest-host species in zeolites: An experimental study." *J. Phys. Chem. B* **1999**, *103*, 5920.
- (30) Shantz, D. F.; **Lobo, R. F.** "Guest-host interactions in zeolites as studied by NMR spectroscopy: implications in synthesis, catalysis and separations." *Top. Catal.* **1999**, *9*, 1.
- (31) Accardi, R. J.; **Lobo, R. F.** "Accessibility of lithium cations in high-silica zeolites investigated using the NMR paramagnetic shift effect of adsorbed oxygen." *Micropor. Mesopor. Mater.* **2000**, *40*, 25.
- (32) Braunbarth, C.; Hillhouse, H. W.; Tsapatsis, M.; Burton, A.; Lobo, R. F.; Jacobinas, R. M.; Kuznicki, S. M. "Structure of strontium ion-exchanged ETS-4 microporous molecular sieves." *Chem. Mater.* **2000**, *12*, 1857.
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- (36) Juttu, G. G.; **Lobo, R. F.** "Characterization and catalytic properties of MCM-56

- and MCM-22 zeolites." *Micropor. Mesopor. Mater.* **2000**, *40*, 9.
- (37) Shantz, D. F.; auf der Gunne, J. S.; Koller, H.; **Lobo, R. F.** "Multiple-quantum H-1 MAS NMR studies of defect sites in as-made all-silica ZSM-12 zeolite." *J. Am. Chem. Soc.* **2000**, *122*, 6659.
- (38) Feuerstein, M.; Accardi, R.J.; **Lobo, R. F.** "Adsorption of Nitrogen and Oxygen in the Zeolites LiA and LiX Investigated by <sup>6</sup>Li and <sup>7</sup>Li MAS NMR Spectroscopy", *J. Phys. Chem. B* **2000**, *104*, 10282.
- (39) Accardi, R. J.; **Lobo, R. F.**; Kalwei, M. "Paramagnetic effect of oxygen in the Na-23 MAS NMR and Na-23 MQMAS NMR spectroscopy of zeolite LiNaX." *J. Phys. Chem. B* **2001**, *105*, 5883.
- (40) Boshoff, J. H. D.; Lobo, R. F.; Wagner, N. J. "Influence of polymer motion, topology and simulation size on penetrant diffusion in amorphous, glassy polymers: Diffusion of helium in polypropylene." *Macromolecules* **2001**, *34*, 6107.
- (41) Shantz, D. F.; **Lobo, R. F.** "Two new silicate hydrates (C<sub>20</sub>H<sub>30</sub>N<sub>2</sub>)(8) • [Si<sub>8</sub>O<sub>20</sub>](2) • 110H(2)O and (C<sub>20</sub>H<sub>30</sub>N<sub>2</sub>)(4) • [Si<sub>8</sub>O<sub>20</sub>] • 42H(2)O, and their implications for the role of non-covalent interactions in high-silica zeolite synthesis." *Micropor. Mesopor. Mater.* **2001**, *43*, 127.
- (42) **Lobo, R. F.**; Koninngsveld, H. v. "A New Description of the Disorder in Zeolite ZSM-48." *J. Am. Chem. Soc.* **2002**, *124*, 13222.
- (43) Sawant, K. R.; **Lobo, R. F.** "Imprinting the Surface of Mesoporous Materials Using Organic Structure-Directing Agents"; International Symposium on Nanoporous Materials, 2002, Ottawa, p 53.
- (44) Wang, Z.; Lambros, J.; **Lobo, R. F.** "Micromechanical compressive response of a zeolite single crystal." *J. Mater. Sci.* **2002**, *37*, 2491.
- (45) Navarro, U.; Trujillo, C.A.; Oviedo, A.; **Lobo, R. F.**; "Impact of the deactivation conditions on the acidity of Y zeolites used for the formulation of FCCcatalysts, studies by FTIR of adsorbed CO", *J. Catal.*, **2002**, *211*, 64.
- (46) Kragten, D. D.; Fedeyko, J. M.; Sawant, K. R.; Rimer, J. D.; Vlachos, D. G.; **Lobo, R. F.**; Tsapatsis, M. "Structure of the silica phase extracted from silica/(TPA)OH solutions containing nanoparticles." *J. Phys. Chem. B.* **2003**, *107*, 10006.
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- (48) van Koningsveld, H.; **Lobo, R. F.** "Disorder in zeolite SSZ-31 described on the basis of one-dimensional building units." *J. Phys. Chem. B* **2003**, *107*, 10983.

- (49) Varkey, S. P.; **Lobo, R. F.**; Theopold, K. H. "Zeolite MCM-22 supported heterogeneous chromium catalyst for ethylene polymerization." *Cat. Letters* **2003**, 88, 227.
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- (52) Fedeyko, J. M.; Rimer, J. D.; Vlachos, D. G.; **Lobo, R. F.** "Spontaneous Formation of Silica Nanoparticles in Basic Solutions of Small Tetraalkylammonium Cations." *J. Phys. Chem. B.* **2004**, 108, 12271.
- (53) Heijboer, W. M.; Glatzel, P.; Sawant, K. R.; Lobo, R. F.; Bergmann, U.; Barrea, R. A.; Koningsberger, D. C.; Weckhuysen, B. M.; de Groot, F. M. F. "K-beta Detected XANES of Framework-Substituted Fe-ZSM-5 Zeolites." *J. Phys. Chem. B* **2004**, 108, 10002.
- (54) Martinez-Inesta, M. M.; Peral, I.; Proffen, T.; **Lobo, R. F.** A pair distribution function analysis for zeolite beta. In Recent Advances In The Science And Technology Of Zeolites And Related Materials, Pts A - C, 2004; Vol. 154; pp 1393.
- (55) Rimer, J.D.; Kragten, D.D.; Tsapatsis, M.; **Lobo, R. F.**; Vlachos, D.G.; Growth Mechanisms of silicalite-1. In Recent Advances In The Science And Technology Of Zeolites And Related Materials, Pts A - C, 2004; Vol. 154; pp 317.
- (56) Martinez-Iñesta, M. M.; Peral, I.; Proffen, T.; **Lobo, R. F.** "A Pair Distribution Function Analysis of Zeolite Beta." *Micropor. Mesopor. Mater.* **2004**, 77, 55.
- (57) Peral, I.; Jones, C. Y.; Varkey, S. P.; **Lobo, R. F.** "Structural comparison of two EUO-type zeolites investigated by neutron diffraction." *Micropor. Mesopor. Mater.* **2004**, 71, 125.
- (58) Smith, M. A.; Foley, H. C.; **Lobo, R. F.** "A simple model describes the PDF of a non-graphitizing carbon." *Carbon* **2004**, 42, 2041.
- (59) van Koningsveld, H.; **Lobo, R. F.**; Martinez-Inesta, M. M. A reinvestigation of the disorder in zeolite UTD-1. In Recent Advances In The Science And Technology Of Zeolites And Related Materials, Pts A - C, 2004; Vol. 154; pp 1180.
- (60) Fedeyko, J. M.; Vlachos, D. G.; **Lobo, R. F.** "Formation and structure of self-assembled silica nanoparticles in basic solutions of organic and inorganic cations." *Langmuir* **2005**, 21, 5197.

- (61) Koller, H.; Fild, C.; Lobo, R. F. "Variable anchoring of boron in zeolite beta." *Micropor. Mesopor. Mater.* **2005**, *79*, 215.
- (62) Kumar, A.; **Lobo, R. F.**; Wagner, N. J. "Porous Amorphous Carbon Models from Periodic Gaussian Chains of Amorphous Polymers." *Carbon* **2005**, *43* 3099-3111.
- (63) Martinez-Inesta, M. M.; **Lobo, R. F.** "Investigation of the negative thermal expansion mechanism of zeolite chabazite using the pair distribution function method." *J. Phys. Chem. B* **2005**, *109*, 9389.
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- (67) Smith, M. A.; **Lobo, R. F.** "The Local and Surface Structure of Ordered Mesoporous Carbons from Nitrogen Sorption, NEXAFS and Synchrotron Radiation Studies." *Micropor. Mesopor. Mater.* **2006**, *92*, 81-93.
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- (71) **Lobo, R.F.**; Palmqvist A.E.C.; "Mechanistic insights into templated materials synthesis", *Curr. Op. Coll. Interf. Sc.* **2005** *10* 185-187. (Editorial)
- (72) Nash, M.; **Lobo, R.F.**; Rikov, S.; Doren, D.J.; "Photocatalytic Activity of Vanadium-substituted ETS-10", *J. Phys. Chem. C.* **2007** *111*, 7029.
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- (75) **Lobo, R.F.**, “The Promise of Emptiness”, *Nature*, **2006**, *443*, 757. (Commentary)
- (76) Huang, W.; McCormick, J. R.; Lobo, R. F.; Chen, J; “Selective hydrogenation of acetylene in the presence of ethylene on zeolite-supported bimetallic catalysts”, *J. Catal*, **2007**, *246*, 40-51.
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- (86) Hould, N., Lobo, R.F., “Nanoparticle Precursors and Phase Selectivity in Hydrothermal Synthesis of Zeolite beta”, *Chem. Mater.* **2008**, *18*, 5807.

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- (95) Fickel, D.W., Lobo, R. F. “Copper coordination in Cu-SSZ-13 and Cu-SSZ-16 investigated by variable temperature XRD”, *J. Phys. Chem. C* **2010** *114*, 1633-1640.
- (96) Smith, M.A., Lobo, R. F., “A fractal description of the pore structure in block-copolymer templated mesoporous silicates”, *Micropor. Mesopor. Mater.*, **2010** *131*, 204-209
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### Books Edited

1. “Microporous and Macroporous Materials,” Eds. R. F. Lobo, J. S. Beck, S. L. Suib, D. R. Corbin, M. E. Davis, L. E. Iton, S. I. Zones, MRS Symposium Proceedings, San Francisco CA, 1996.

### Books Chapters

1. **R. F. Lobo**. "Introduction to the Structural Chemistry of Zeolites" in Handbook of Zeolite Science and Technology, eds. Scott Auerbach, Kathleen Carrado, and Prabir Dutta, Marcel Dekker: New York, 2003.
2. **Raul F. Lobo**, Intermolecular Forces in Zeolite Adsorption and Catalysis in “Ordered porous solids: recent advances and prospects”. Eds. S. Mintova, M. Tsapatsis, V. Valtchev, Elsevier, 2009, 800 pp.
3. D. Fickel and **R. F. Lobo**, The Synthesis of Zeolites from the Perspective of Solid-Solutions of Sodium Aluminate in a Silica Matrix, in “Zeolites: from Model Materials to Industrial Applications”. Eds. J. Cejka, J. Perez-Pariente, W. J. Roth, Research Signpost: Trivandrum, India, 2008.

### Patents and Patent Applications

1. R. F. Lobo and M. E. Davis, US Patent 5512267, “Zeolite CIT-1,” April 30, 1996.
2. D. Corbin, S. Schwarz, R. F. Lobo, “Process for Preparing Methylamines Using Acidic Chabazite-type Zeolite Catalysts,” US 6166258, Dec. 2000.
3. D. Corbin, R. F. Lobo, S. Schwarz, “Method of making methylamines using chabazite catalysts”, US6232502B1, Nov. 1998.
4. 10 US patent applications pending.

### Presentations at Professional Meetings

ACS Symposium on “Sol-Gel Synthesis of Catalysts and Advanced Materials”, American Chem. Soc., San Francisco, CA (April 1997)

International Symposium on Zeolites and Microporous Crystals, Japan Association of Zeolites, Tokyo, Japan (August, 1997)

North American Catalysis Society Meeting, Chicago, IL, (Invited Lecture, May 1997)

North East Corridor Zeolite Association (NECZA), Philadelphia (December 1997)

AICHE Annual Meeting, Adsorption Fundamentals Session, (Nov., 1998)  
Materials Research Society Meeting, Boston, MA (Dec. 1998)  
International Catalysis Conference, Granada, Spain (Jul. 2000)  
International Symposium on Zeolites and Microporous Crystals, Sendai, Japan  
(August, 2000)  
International Symposium on Zeolites and Microporous Crystals, Post-Symposium,  
Tokyo, Japan (August 2000)  
AIChE Annual Meeting, Indianapolis (November, 2002)  
North East Corridor Zeolite Association (NECZA), Philadelphia (December 2002)  
International Zeolite Conference, Cape Town (April 2004)  
American Conference on Neutron Scattering, Washington DC (June 2004)  
International Catalysis Conference, Paris (July 2004)  
Gordon Research Conferences (Solid-State Chemistry), New London, NH (July,  
2004)  
Simposio Iberoamericano de Catálisis, Merida, Mexico (September, 2004)  
North East Corridor Zeolite Association (NECZA), Philadelphia (December 2004)  
American Chemical Society National Meeting, San Diego, CA (March, 2005)  
Colloids and Surface Science Division  
American Chemical Society National Meeting, Atlanta, GA (March, 2006) Colloids  
and Surface Science Division  
American Chemical Society National Meeting, Atlanta, GA (March, 2006) Petroleum  
Chemistry Division  
International Catalysis Congress, Seoul, Korea (July, 2008).  
247<sup>th</sup> ACS National Meeting, Symposium in Honor of Mark Davis, Dallas, TX,  
March 2014  
Advanced Porous Materials Symposium, ETH, Zurich, Swiss., June 2014  
AIChE Annual Meeting, Atlanta, GA, Nov. 2014.

### **Invited Talks at Professional Meetings and Academic Institutions (since 2000)**

Princeton University, NJ (October, 2000)  
Instituto de Ciencia de Materiales, Barcelona, Spain (August, 2001)  
Instituto de Catálisis y Petroleoquímica, Madrid, Spain (August, 2001)  
Laboratory for Crystallography, ETH, Switzerland (January, 2002)  
University of Amsterdam, The Netherlands (March, 2002)

Catholic University at Louvain, Belgium (April, 2002)  
North East Corridor Zeolite Association (NECZA), Philadelphia (December 2002)  
British Zeolite Conference, Edinburgh, United Kingdom (August 2002)  
International Union for Crystallography General Meeting, Geneva (August 2002)  
University of Florida, Gainesville, FL (April 2003)  
American Chemical Society National Meeting, Irvine CA (March, 2004)  
California Institute of Technology, Pasadena (March, 2004)  
Tulane University, New Orleans, LA (September, 2004)  
American Chemical Society National Meeting, San Diego, CA (March, 2005) Two talks in Colloids and Surface Science Division, and Petroleum Division  
Gordon Research Conferences (Zeolite and Layered Materials), New London, NH (July, 2005)  
University of California at Santa Barbara, Santa Barbara, CA (Nov., 2008)  
University of California at Davis, Davis, CA (Oct., 2010)  
University of California at Berkeley, Berkeley, CA (Oct. 2010)  
AIChE Annual Meeting, Symposium in honor of Thomas Degnan, Salt Lake City, UT (Nov. 2010)  
Frontiers in Catalysis Series, Pacific Northwest National Laboratory, Richland, WA (Nov. 2010)  
Plenary Talk, International Zeolite Conference, Moscow, July, 2013  
Worcester Polytechnic Institute, Worcester, MA, Oct., 2013  
ExxonMobil, Clinton, NJ, January, 2014  
University of Pennsylvania, October, 2014  
Colorado School of Mines, January, 2015  
University of Notre Dame, February, 2015  
Rutgers University, March, 2016  
International Zeolite Conference School, Campinas, Brazil (two lectures), 2016  
Purdue University, September, 2016  
British Zeolite Association Annual Meeting, April, 2017  
Philadelphia Catalysis Club, September 2017  
University of Connecticut, October, 2017  
UOP, October, 2017  
TOCAT, Yokohama, Japan, Aug., 2018  
ZMPC, Yokohama, Japan, Aug., 2018  
NECZA, Philadelphia, PA, Dec., 2018

AICHE Meeting, Pittsburg, PA, Nov., 2018

## Graduate Student Mentoring and Training

### Undergraduate Student Thesis (since 2000)

Melanie Webb, 2002, Senior Thesis: *Photoreduction of Silver on ETS-10*. Currently graduate student in Princeton University.

Stephen Ekatan, 2004, Senior Project: *Investigation of the Self Assembly of Nanoparticles*

Emilly Maldonado, Merck visiting student from the University of Puerto Rico at Mayaguez (summer 2005). *Silica Nanoparticles for Composite Materials*

Daniel Roth, 2007. *Self-Assembly of Germania Nanoparticles*.

Joshua Condem, 2008. *Silica Microstructure in Physiological Conditions*.

### Past Graduate Students (28)

Daniel Shantz, Ph. D., 2000. Chemical Engineering. *Guest Host Interactions in High-Silica Zeolites*. Currently at Texas A&M University, College Station, TX.

Allen Burton, Ph. D., 2000. Chemical Engineering. *Cation siting in low-silica zeolites with potential applications in pressure swing adsorption technology and structural studies of novel tectosilicates* . Currently at Chevron Research and Technology, Richmond, CA.

Gopalakrishnan Juttu, Ph. D., 2001. Chemical Engineering. *Modified Microporous Aluminosilicates as novel solid acid catalysts*. Currently at SABIC, Houston, TX.

Robyn Accardi, Ph.D., 2002. Chemical Engineering. *Structure-Property Relationships in Zeolites: Characterization by Combined NMR and Diffraction Methods*. Currently with Ceramem, Inc., Boston, MA.

Jan Boshoff, Ph. D., 2004. Chemical Engineering. *Configurational Diffusion in Glassy, Amorphous Polymers: Effects of Polymer Structure on Permeation via Molecular Simulation*. Currently at SASOL, South Africa. Co-Advised with Prof. Norman Wagner.

Kaveri Sawant, Ph D., 2004. Chemical Engineering. *Imprinting the Surface of Mesoporous Aluminosilicates using Organic Structure-Directing Agents*. Currently with Rohm & Haas Electronic Materials, Newark, DE.

Michael Smith, Ph D., 2004. Chemical Engineering. *Nanoporous Carbon Synthesis, Characterization and Control of the Local Structure by Templated Pyrolysis*.

María Martínez-Iñesta, Chemical Engineering (2000-2005). *The Pair Distribution Function Method and its Application to Complex Zeolite Structural Problems*. Assistant professor at the University of Puerto Rico at Mayagüez.

Joseph Fedeyko, Chemical Engineering (2001-2006). *Silica Self-Assembly in Basic Aqueous Solutions*. Co-advised with Prof. Dionisios Vlachos. Johnson & Matthey Catalysis, PA.

- Jeffrey Rimer, Chemical Engineering (2001-2007). *Growth Mechanisms of Zeolite Silicalite-1*. Co-advised with Prof. Dionisios Vlachos. Currently a postdoctoral fellow at NYU, Department of Chemistry.
- Michael Nash, Chemical Engineering (2003-2008). *Photocatalysis with ETS-10 Materials*. Currently at Eastman Chemical Co., Tennessee.
- Wei Huang, Chemical Engineering (2003-2008). *Selective Hydrogenation/Dehydrogenation Catalysis using Supported Bimetallic Catalysts*. With Prof. Jinguang Chen. Air Liquide America, LLC.
- Ann Marie Shough (2003-2008), Chemistry. *Quantum Chemistry Studies of Catalytic and Photocatalytic Materials: Transition Metal Substitution, Active Sites, Thermodynamics, and Reaction Mechanisms* With Prof. Douglas Doren. Currently at ExxonMobil.
- William Pyrz, Chemical Engineering (2004-2008). *Transmission Electron Microscopy of Bimetallic Supported Catalysts*. Co-advised with Prof. Douglas Buttrey. Currently at Merck Inc.
- Dustin Fickel, Chemical Engineering (2005-2010). *High Temperature Reactivity of Bronsted Acid and Defect Sites in Zeolites*. Currently at Sabic Corp.
- Khalid Al-Majnouni(2006-2011). *Alkane Cracking via Redox Mechanisms in acid zeolites*. Sabic.
- Nathan Hould (2006-2011). *Nanoparticle Precursors in the Mechanism of Formation of High Silica Zeolites*.
- Bharat Bopana (2007-2011). *Novel Oxinitrides for the decomposition of Volatile-Organic-Compounds using Visible Light*. Corning Chemical Co.
- Andrew Foster (2008-2012). *Development of Zeolite Catalysts for Catalytic Fast Pyrolysis of Biomass*. Chervron Research and Technology.
- Brett Guralnik (2008-2013). *Novel Hybrid Photovoltaic Devices Based on Zn<sub>3</sub>P<sub>2</sub> Nanoparticles*.
- Jang Ho Yun (2009-2014). *Redox Processes in High-Silica Zeolites*. Samsung-Total, Korea
- Trong Pham (2010-2015). *Zeolite Adsorbents for CO<sub>2</sub> separations*. Sabic.
- Jason Loiland (2011-2015). *Mechanisms of NO oxidation over High-Silica Zeolites*. Sabic USA
- Eyas Mahmoud (2011-2016) *Biomass Upgrading into Fuels and Chemicals*.
- Bahar Ipek (2011-2016) *Small Pore Zeolites for H<sub>2</sub> adsorption and Direct Methanol Production*.
- Huibo Sheng (2012-2017) *Hydrogenation of Biomass-Derived Oxygenates*
- Edward Schreiner (2012-2017) *Controlling Hydrocarbon Conversion and Selectivity with Zeolite Catalysts*

Maura Koehle (2013-2017) *Kinetics and Selectivity of Microporous Lewis Acid Catalysts for Biomass Transformations*

### **Current Graduate Students**

Chen-Yu Chou (2015-present) *Catalytic Reduction of CO<sub>2</sub> to CO and Methanol*

Muyuan Li (2016-present) *Ethane Activation on Metal-Exchanged Zeolite Catalysts*

Mark Lafollette (2018-present) *Methanol to Olefins over Microporous Iron-Silicates*

Jason Lee (2018-present) *Hydrocarbon Aromatization Mechanisms over Zeolite Catalysts*

Eric Steinman (2018-present) *Aromatics from methane via Looping Chemistry.*

Hsuan-Lan Wang (2018-present) *Boudouar reaction and Catalyst Deactivation*

Mingchun Ye (2019-present) *Fundamental investigations of Proton Transfer in Acid Catalysis*

### **Past and Present Postdoctoral Fellows**

Dr. Matthias Feuerstein, 1996-1998.

Dr. Stephan Riemann, 1999-2000.

Dr. Raphael Peshche, 2001-2002. Co-supervised with Prof. Norman Wagner.

Dr. Zhong-Min Wang, 2000-2001

Dr. David Kragten, 2002-2003. Co-supervised with Prof. Dionisios Vlachos

Dr. Saji Varkey, 2000-2002. Co-supervised with Prof. Klaus Theopold.

Dr. Inmaculada Peral, 2001-2003.

Dr. Apoorva Kulkarni, 2010-2011

Dr. Ana Belen Pinar, 2010-2011

Dr. Qingling Liu, 2011-2013

Dr. Ji Na, 2012-2013. Co-supervised with Prof. Jingguang Chen

Dr. Adriana Aristizabal, 2012-2013

Dr. Matthew Wulfers, 2013-2014

Dr. Shewanigan Forsido, 2013-2014

Dr. Takahito Moteki, 2013-2014

Dr. Jelvenaz Mirzababaei, 2014-2016

Dr. Erisa Saraci, 2015-2018

Dr. Ali Mehdad, 2015-present

Dr. Young Jin Kim, 2015-2016

Dr. Trong Pham, 2015-2016

Dr. Efterpi Vasileiadou, 2015-2018

Dr. Bahar Ipek, 2016-2017

Dr. Ting Jian, 2017-2018

Dr. Shoucheng Du, 2017-2018

Dr. Sebastian Prodingler, 2018-present

