



Moises A. Carreon

Associate Professor

William Coors Developmental Chair

Chemical & Biological Engineering Department

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Professional Preparation

U.M.S.N.H. Mexico	Chemical Engineering	B.S.	1997
U.M.S.N.H. Mexico	Materials Science Engineering	M.S.	1999
University of Cincinnati	Chemical & Materials Engineering	Ph.D.	2003
University of Toronto	Chemistry (Nanochemistry of Materials)	Postdoc	2004-2005

Appointments

1/14- present	Associate Professor, Chemical & Biological Engineering Dept. Colorado School of Mines
6/13- 12/13	Associate Professor, Chemical Engineering Dept. University of Louisville.
7/07 -5/13	Assistant Professor, Chemical Engineering Dept. University of Louisville.
1/06-6/07	Research Associate, Chemical Engineering & Biological Engineering Department, University of Colorado.
9/03-8/04	Assistant Professor, Materials Science Engineering, Materials Research Institute, University of Michoacan, Mexico.

Awards as Independent Researcher

2018	Early Career Scholar in Materials Science. Journal of Materials Research.
2014	Innovator Award. Society of Hispanic Professional Engineers
2014	List of 12 extraordinary personalities that moved Mexico in 2014. Mexico News Network http://www.mexiconewsnetwork.com/news/mexican-personalities-2014/
2014	National Academy of Engineers Frontiers of Engineering Symposium invitee
2014	Magazine "Quien". List of 50 personalities who transform Mexico.
2013	PECASE (Presidential Early Career Award for Scientists and Engineers)
2013	AIChE Separations Division Kunesh Award
2011	NSF CAREER AWARD
2010	Carl Storm Minority Fellowship. Gordon Conference on membranes
2010	NAMS Travel Award . North American Membrane Society Meeting.
2009	ACS-PRF Doctoral New Investigator award.

Awards as Postdoc and Graduate Student

2008	NSF Fellowship to attend Summer Institute course at Northwestern University
2007	American Institute of Chemists Postdoctoral Award. University of Colorado.
2003	Outstanding Graduate Student in Research Award. University of Cincinnati.
2003	Kokes Award, 18th North American Catalysis Society Meeting. Cancun, Mexico.
2002	Graduate Research Summer Award. University of Cincinnati.
2001	Kokes Award. 17th North American Catalysis Society Meeting. Toronto, Canada.

List of Refereed Publications

- 68) L. Yang, M.A. Carreon*, Deoxygenation of palmitic and lauric acids over Pt/ZIF-67 membrane/zeolite 5A bead catalysts *ACS Applied Materials & Interfaces* **2017**, *in press* DOI: 10.1021/acsami.7b11638.
- 67) M.A. Carreon* Molecular Sieve Membranes for N₂/CH₄ Separation, *Journal of Materials Research* **2017**, *in press* DOI: <https://doi.org/10.1557/jmr.2017.297>
- 66) L. Yang, B. McNichols, B. Schweitzer, D. Gomez-Gualdron, B. G. Trewyn, A. Sellinger, M. A. Carreon*, Noble metal-free catalytic decarboxylation of oleic acid to n-heptadecane on nickel-based metal-organic frameworks (MOFs), *Catalysis Science and Technology* **2017**, *7*, 3027-3035.
- 65) Z. Zong, S.K. Elsaidi, P.K. Thallapally, M.A. Carreon*, Highly permeable AlPO-18 membranes for N₂/CH₄ separation, *Industrial & Engineering Chemistry Research* **2017**, *56*, 4113–4118.
- 64) T. Wu, X. Feng, M. L. Carreon, M. A. Carreon*, "Synthesis of SAPO-56 with controlled crystal size", *Journal of Nanoparticle Research* **2017**, *19*, 93, 1-8.
- 63) T. Wu, X. Feng, S. K. Elsaidi, P.K. Thallapally, M. A. Carreon*, Zeolitic Imidazolate Framework-8 (ZIF-8) membranes for Kr/Xe separation, *Industrial & Engineering Chemistry Research* **2017**, *56*, 1682–1686.
- 62) Z. Zong, M.A. Carreon*, Thin SAPO-34 Membranes Synthesized in Stainless Steel Autoclaves for N₂/CH₄ Separation, *Journal of Membrane Science* **2017**, *524*, 117-123.
- 61) L. Yang, M.A. Carreon*, Effect of Reaction Parameters on the Decarboxylation of Oleic Acid over Pt/ZIF-67 membrane/zeolite 5A bead catalysts, *Journal of Chemical Technology & Biotechnology* **2017**, *92*, 52-58.
- 60) K.L. Tate, S. Li, M. Yu, M.A. Carreon*, Zeolite adsorbent- MOF layered nanovalves for CH₄ storage, *Adsorption* **2017**, *23*, 19-24.
- 59) X. Feng, T. Wu, M.A. Carreon*, Synthesis of ZIF-67 and ZIF-8 crystals using DMSO (Dimethyl Sulfoxide) as solvent and kinetic transformation studies, *Journal of Crystal Growth* **2016**, *455*, 152-156
- 58) X. Feng, Z. Zong, S. K. Elsaidi, J. B. Jasinski, R. Krishna, P.K. Thallapally, M. A. Carreon*, "Kr/Xe Separation over a Chabazite Zeolite Membrane" *Journal of the American Chemical Society* **2016**, *138*, 31,9791–9794.
- 57) Z. Song, A. Nambo, K. L. Tate, A. Bao, M. Zhu, J. B. Jasinski, S. J. Zhou, H. S. Meyer, M. A. Carreon*, S. Li, M. Yu, "Nanovalved adsorbents for CH₄ storage" *Nano Letters* **2016**, *16*,5, 3309–3313
- 56) Z. Xie, Z. He, X. Feng, W. Xu, X. Cui, J. Zhang, C. Yan, M. A. Carreon, Z. Liu, Y. Wang, "Hierarchical Sandwich-Like Structure of Ultrafine N-Rich Porous Carbon Nanospheres Grown on Graphene Sheets as Superior Lithium-Ion Battery Anodes" *ACS Applied Materials & Interfaces* **2016**, *8*, 16, 10324–10333.
- 55) M. J. Valero-Pedraza, V. Gascón, M. A. Carreon, F. Leardini, J. R. Ares, A. Martín, M. Sánchez-Sánchez, M. A. Bañares, "Operando Raman-mass spectrometry investigation of hydrogen release by thermolysis of ammonia borane confined in mesoporous materials" *Microporous and Mesoporous Materials* **2016**, *226*, 454-465.
- 54) S. M. Bruce, Z. Zong, A. Chatzidimitriou, L. E. Avci, J. Q. Bond, M. A. Carreon, S. G. Wettstein "Small pore zeolite catalysts for furfural synthesis from xylose and switchgrass in a γ -valerolactone/water solvent" *Journal of Molecular Catalysis A: Chemical* **2016**, *422*, 18-22.
- 53) Z. Zong, X. Feng, Y. Huang, Z. Song, R. Zhou, S.J. Zhou, M.A. Carreon*, M. Yu, S. Li, Highly permeable N₂/CH₄ separation SAPO-34 membranes synthesized by diluted gels and increased crystallization temperature, *Microporous and Mesoporous Materials* **2016**, *224*, 36-42.
- 52) M.C. Duke, B. Zhu, C.M. Doherty, M.R. Hill, A.J. Hill, M.A. Carreon, "Structural effects on SAPO-34 and ZIF-8 materials exposed to seawater solutions, and their potential as desalination membranes", *Desalination* **2016**, *377*, 128-137.
- 51) L. Yang, K. Tate, J.B. Jasinski, M.A. Carreon*, "Decarboxylation of oleic acid to heptadecane over Pt-supported zeolite 5A beads", *ACS Catalysis* **2015**, *5*, 6497-6502.

- 50) S.R. Venna, M.A.Carreon* Metal organic framework membranes for carbon dioxide separation, *Chemical Engineering Science* **2015**, 124, 3-19.
- 49) S. Li, Z. Zong, S.J. Zhou, Y. Huang, Z. Song, X. Feng, R. Zhou, H. S. Meyer, M. Yu, M. A. Carreon* , SAPO-34 Membranes for N₂/CH₄ Separation: Preparation, Characterization, Separation Performance and Economic Evaluation, *Journal of Membrane Science* **2015**, 487, 141.
- 48) M. Ahmadi, A. Nambo, J. B. Jasinski, P. Ratnasamy, M. A. Carreon*, “Decarboxylation of oleic acid over Pt catalysts supported on small-pore zeolites and hydrotalcite” *Catalysis Science and Technology* **2015**, 5, 380-388.
- 47) X. Feng, M.A. Carreon* , Kinetics of transformation on ZIF-67 crystals, *Journal of Crystal Growth* **2015**, 418, 158-162.
- 46) A. Nambo, Carmen M. Miralda, Jacek B. Jasinski, M.A. Carreon* , “Methanolysis of Olive Oil for biodiesel synthesis over ZnO nanorods”, *Reaction Kinetics, Mechanisms and Catalysis* **2015**, 114, 583-595.
- 45) L. Yang, G. Ruess, M.A. Carreon* , “Cu, Al and Ga based metal organic framework catalysts for the decarboxylation of oleic acid” *Catalysis Science and Technology* **2015**, 5, 2777-2782.
- 44) M. Ahmadi, E. E. Macias, J. B. Jasinski, P. Ratnasamy, M. A. Carreon* , “Decarboxylation and further transformation of oleic acid over bifunctional Pt/SAPO-11 catalysts and Pt/chloride Al₂O₃ catalysts” *Journal of Molecular Catalysis A: Chemical*, **2014**, 386, 14.
- 43) Z. Xie, T.Li, N.L. Rosi, M.A. Carreon* “Alumina-supported cobalt–adeninate MOF membranes for CO₂/CH₄ separation” *J. Mater. Chem. A* **2014**, 2, 1239-1241.
- 42) M. Zhu, M.A. Carreon*, “Porous crystals as active catalysts for the synthesis of cyclic carbonates” *J. Appl. Polymer Science* **2014**, 131, 39738.
- 41) S.R. Venna, M. Zhu, S. Li, M.A. Carreon* “Knudsen diffusion through ZIF-8 membranes synthesized by secondary seeded growth” *J. Porous Mater.* **2014**, 21, 235.
- 40) M. Zhu, D. Srinivas, S. Bhogeswararao, P. Ratnasamy, M.A. Carreon*, “Catalytic activity of ZIF-8 in the synthesis of styrene carbonate from CO₂ and styrene oxide”, *Catalysis Communications* **2013**, 32, 36-40.
- 39) Z. Xie, M. Zhu, A. Nambo, J.B. Jasinski, M.A. Carreon*, “Microwave-assisted synthesized SAPO-56 as catalyst in the conversion of CO₂ to cyclic carbonates” *Dalton Transactions* **2013** 42, 6732-6735.
- 38) E.E. Macias, P. Ratnasamy, M.A. Carreon* “Catalytic activity of metal organic framework Cu₃(BTC)₂ in the cycloaddition of CO₂ to epichlorohydrin reaction” *Catalysis Today* **2012**, 198, 215-218.
- 37) M.A. Carreon* “Metal Organic Frameworks as Catalysts in the Conversion of CO₂ to Cyclic Carbonates” *Ind. J. Chem. A* **2012**, 51A, 1306-1314
- 36) J.A. Bohrman, M.A.Carreon* “Synthesis and CO₂/CH₄ separation performance of Bio-MOF-1 Membranes” *Chemical Communications* **2012**, 48, 5130-5132.
- 35) M. Zhu, J.B. Jasinski, M.A. Carreon* “Growth of Zeolitic Imidazolate Framework-8 Crystals from the Solid-liquid Interface” *Journal of Materials Chemistry* **2012**, 22, 7684-7686.
- 34) M.L. Carreon, S. Li, M.A. Carreon* , “AlPO-18 Membranes for CO₂/CH₄ Separation” *Chemical Communications* **2012**, 48, 2310.
- 33) C. Miralda, E.E. Macias, M. Zhu, P. Ratnasamy, M.A. Carreon*, “Zeolitic imidazole Framework-8 catalysts in the conversion of CO₂ to chloropropene carbonate” *ACS-Catalysis* **2012**, 2, 180-183.
- 32) M. Zhu, S.R. Venna, J.B. Jasinski, M.A. Carreon*, “Room temperature synthesis of ZIF-8: The coexistence of ZnO nanoneedles, *Chemistry of Materials* **2011**, 23, 3590-3592.
- 31) C.A. Deshmane, J. B. Jasinski, P. Ratnasamy, M. A. Carreon*, “ Epoxidation of Cyclooctene Over Mesoporous Ga, Ga-Nb, and Ga-Mo Mixed Oxide Catalysts” *Catalysis Communications* **2011**, 15, 46-51.
- 30) S.R. Venna, M.A.Carreon*, “Amino-functionalized SAPO-34 membranes for CO₂/CH₄ and CO₂/N₂ separation” *Langmuir* **2011**, 27, 2888-2894.
- 29) E. E. Macias, C.A. Deshmane, J. B. Jasinski, M. A. Carreon*, P. Ratnasamy, Catalytic Transformations of Methyl Oleate and Biodiesel Over Mesoporous Gallium-Niobium Oxides, *Catalysis Communications* **2011**, 12 644-650.

- 28) M.L. Carreon, H. G.Carreon, J. Espino-Valencia, M. A. Carreon*, “Photocatalytic degradation of organic dyes by mesoporous nanocrystalline anatase”, *Materials Chemistry and Physics* **2011**, *125*, 474-478.
- 27) S.R. Venna, Jacek B. Jasinski, M.A.Carreon*, “Structural Evolution of Zeolitic Imidazolate Framework-8” *Journal of the American Chemical Society* **2010**, *132*, 18030–18033.
- 26) C.A. Deshmane, J.B. Jasinski, P. Ratnasamy, M.A. Carreon* Synthesis and catalytic properties of mesoporous, bifunctional, gallium-niobium mixed oxides, *Chemical Communications* **2010**, *46*, 6347-6349.
- 25) S. Li, M.A. Carreon, Y. Zhang, H. H. Funke, R.D. Noble, J.L. Falconer, “Scale-up of SAPO-34 Membranes for CO₂/CH₄ Separation”, *Journal of Membrane Science* **2010**, *352*, 7-13.
- 24) S.R. Venna, M.A.Carreon*, “Highly Permeable Zeolite Imidazolate Framework-8 Membranes for CO₂/CH₄ Separation”, *Journal of the American Chemical Society* **2010**, *132*, 76-78.
- 23) C.A. Deshmane J.B.Jasinski, M.A.Carreon*, “Microwave-assisted synthesis of nanocrystalline gallium oxide”, *Microporous and Mesoporous Materials* **2010**, *130*, 97-102.
- 22) A. Katti, S.R. Venna, M.A. Carreon*, “Self assembly hydrothermal assisted synthesis of mesoporous anatase in the presence of ethylene glycol”, *Catalysis Communications* **2009**, *10*, 2036-2040.
- 21) C.A. Deshmane J.B. Jasinski, M.A.Carreon*, “Thermally Stable Nanocrystalline Mesoporous Gallium Oxide Phases”, *European Journal of Inorganic Chemistry* **2009**, *22*, 3275-3281.
- 20) S.R. Venna, M.A.Carreon*, “Microwave assisted phase transformation of silicoaluminophosphate zeolite crystals”, *Journal of Materials Chemistry* **2009**, *19*, 3138-3140.
- 19) M.A. Carreon, V.V. Guliants, M. Olga Guerrero-Perez, Miguel A. Bañares, “Mesostructured mixed Mo-V-Nb oxides for propane ammoxidation”, *Catalysis Communications* **2009**, *10*, 416-420.
- 18) S.R. Venna, M.A. Carreon*, “Synthesis of SAPO-34 crystals in the presence of crystal growth inhibitors”, *Journal of Physical Chemistry B* **2008**, *112*, 16261-16265.
- 17) M.A. Carreon, S.Li, J.L. Falconer, R.D. Noble, “Alumina-Supported SAPO-34 Membranes for CO₂/CH₄ Separation” *Journal of the American Chemical Society* **2008**, *130*, 5412-5413.
- 16) M.A. Carreon, S.Li, J.L. Falconer, R.D. Noble “SAPO-34 Seeds and Membranes Prepared Using Multiple Structure Directing Agents” *Advanced Materials* **2008**, *20*, 729-732.
- 15) M.A. Carreon, S.-Y. Choi, M. Mamak, N. Chopra, G.A. Ozin, “Pore Architecture Affects Photocatalytic Activity of Periodic Mesoporous Nanocrystalline Anatase Thin Films” *Journal of Materials Chemistry* **2007**, *17*, 82-89.
- 14) M.A. Carreon, V.V. Guliants, L. Yuan, A.R. Hughett, A. Dozier, G.A. Seisenbaeva, V.G. Kessler, “Mesoporous Nanocrystalline Mixed Metal Oxides from Heterometallic Alkoxide Precursors: Spinel Cobalt-Nickel Oxide Spinels for Propane Oxidation” *European Journal of Inorganic Chemistry* **2006**, *24*, 4983-4988.
- 13) E.E. Macias, J.C. Corral-Huacuz, M.E. Contreras, M.A. Carreon* “Thermally stable mesoporous barium-iron mixed oxide phases” *Materials Letters* **2006**, *60*, 2119-2124.
- 12) E.E. Macias, V.V. Guliants, M.A. Carreon* “Mesostructured and mesoporous pure and substituted barium hexaferrites” *Studies in Surface Science and Catalysis* **2005**, *156*, 287-294.
- 11) M.A. Carreon and V.V. Guliants, “Synthesis of catalytic materials on multiple length scales: From mesoporous to macroporous bulk mixed metal oxides for selective oxidation of hydrocarbons”, *Catalysis Today* **2005**, *99*, (1-2) 137-142.
- 10) M.A. Carreon and V.V. Guliants, “Ordered meso and macroporous binary and mixed metal oxides”, *European Journal of Inorganic Chemistry* **2005**, *1*, 27-43.
- 9) M.A. Carreon , V.V. Guliants, M. O. Guerrero, M.A. Bañares “Phase transformations in mesostructured VPO/Surfactant composites”, *Microporous and Mesoporous Materials* **2004**, *71* (1-3) 57-63.
- 8) V.V. Guliants, M.A. Carreon, J.Y. Lin “Ordered mesoporous and macroporous inorganic films and membranes”, *Journal of Membrane Science* **2004**, *235* (1-2) 53-72.

- 7) M.A. Carreon, V.V. Guliants, F. Pierelli, F. Cavani “Ordered mesostructured mixed metal oxides: microporous VPO phases for n-butane oxidation to maleic anhydride”, *Catalysis Letters* **2004**, 92 (1-2) 11-16.
 - 6) M.A. Carreon and V.V. Guliants, “Phase transformations in mesostructured vanadium-phosphorus oxides”, *Catalysis Today* **2003**, 78 (1-4), 303-310.
 - 5) M.A. Carreon and V.V. Guliants, “Synthesis and characterization of mesostructured vanadium-phosphorus-oxide phases”, *Studies in Surface Science and Catalysis* **2002**, 141, 301-308.
 - 4) M.A. Carreon and V.V. Guliants, “Novel macroporous vanadium-phosphorus oxides with three-dimensional arrays of spherical voids”, *Studies in Surface Science and Catalysis* **2002**, 141, 309-316.
 - 3) M.A. Carreon and V.V. Guliants, “Mesostructured vanadium-phosphorus oxide phases”, *Microporous and Mesoporous Materials* **2002**, 55, 3, 297-304.
 - 2) M.A. Carreon and V.V. Guliants, “Macroporous vanadium phosphorus oxide phases displaying three-dimensional arrays of spherical voids” *Chemistry of Materials* **2002**, 14, 6, 2670-2675.
 - 1) M.A. Carreon and V.V. Guliants, “Hierarchical design of mixed metal oxides: novel macroporous VPO phases”, *Chemical Communications* **2001**, 16, 1438-1439.
- * denotes publication as corresponding author

Book Chapters

6. S. Li, Z. Zong, M. Yu, M.A. Carreon* “Membrane Processes for N₂/CH₄ separation” 4, 145-194 on Membranes for Gas Separations, World Scientific Series in Membrane Science and Technology; Biological and Biomimetic Applications, Energy and the Environment, **2017**.
5. M.A. Carreon* , T.Q. Gardner, “Microporous crystalline membranes and their application for CO₂ separation” on Pore Scale Phenomena: Frontiers in Energy and Environment, World Scientific, 10, 401-434, **2015**.
4. M.A. Carreon, V.V. Guliants “Selective Oxidation of n-butane over vanadium-phosphorus oxide” on *Nanostructured Catalysts: Selective Oxidations* 6, 141-168, The Royal Society of Chemistry **2011**.
3. M.A. Carreon, V.V. Guliants “Catalysts Design Through Dual Templating” Book Chapter, 12, 295-314, *Design of Heterogeneous Catalysis. New Approaches based on Synthesis, Characterization and Modeling*, Wiley-VCH **2009**.
2. M.A. Carreon, V.V. Guliants “Mesostructuring Metal Oxides through Evaporation Induced Self-Assembly: Fundamentals and Applications” Book Chapter, 16, 407-432, *Nanoporous Solids, Recent Advances and Prospects*, Elsevier **2008**.
1. V.V. Guliants, M.A. Carreon, “Vanadium-Phosphorus-Oxides: from fundamentals of n-Butane to Synthesis of New Phases” Book Chapter, Catalysis, Vol.18, The Royal Society of Chemistry **2005**, 1-45.

* denotes publication as corresponding author

Edited Books

1. M.A. Carreon “Membranes for Gas Separations”. World Scientific Series in Membrane Science and Technology; Biological and Biomimetic Applications, Energy and the Environment, Volume 1, 376 pages. ISBN: 978-981-3207-70-7, **2017**.

Patents

5. S. Li, S. Zhou, H.S. Meyer, M. Yu, M.A. Carreon, “Method for loading and storing gas in nanovalved-adsorbents”, US Patent No. 9,249,934 B2, **2016**.
4. S. Li, S. Zhou, M. Yu, M.A. Carreon, “Nano-channel enhanced composite membranes”, US Patent No. 9,005,345 B2, **2015**.
3. P. Ratnasamy; M.A. Carreon; C. Deshmane, “Catalytic isomerisation of linear olefinic hydrocarbons”, US Patent No. 8,785,709, **2014**.

2. M.A. Carreon; Z. Diaz; J.L. Falconer; H.H. Funke; S. Li; B.D. Murray; R.D. Noble; W. P. Jason; “Method of Making a High-Performance Supported Gas Separation Molecular Sieve Membrane Using a Shortened Crystallization Time”, US Patent No. 8,685,143, **2014**.
1. J.L Falconer; M.A Carreon ; S. Li; R.D. Noble; “ Synthesis of zeolites and zeolite membranes using multiple structure directing agents”, US Patent No. 8,302,782, **2012**.

Conferences and Presentations

~80 Technical Conferences in Regional, National, and International Meetings, including mainly presentations at: American Institute of Chemical Engineers (AIChE); Materials Research Society (MRS); American Chemical Society (ACS); North American Membrane Society (NAMS); North American Catalysis Society (NACS); ICOM (International Conference on Membranes); and Gordon Conferences.

Selected invited presentations

- “Crystalline membranes for Kr/Xe separation”, invited presentation at ACS, Philadelphia, PA, August 2016.
- “Zeolite vs MOF membranes: which is best”? invited presentation at AIChE, San Francisco, CA November 2013.
- “Novel membranes for efficient CO₂ separation” invited presentation at 22nd National NSF EPSCoR Conference. Coeur d’Alene, Idaho, October 27, 2011 (only 3 NSF CAREER awardees were invited to present).
- “SAPO-34 and ZIF-8 membranes for carbon dioxide separation” invited presentation in the Chemical & Biomolecular Engineering Department at Ohio University (Graduate Seminar Series). Athens, OH. May 11, 2010.
- “Zeolite and metal organic framework membranes for carbon dioxide purification” invited presentation in the Chemistry Department at Lehigh University (Graduate Seminar Series). Bethlehem, PA. April 14, 2010.
- “Molecular Design of Ordered Porous Materials for Functional Applications in Catalysis and Gas Separations” invited presentation in the Chemical Engineering Department at UMSNH-Mexico (Graduate Seminar Series), Morelia, Mexico. July 16, 2009.
- “Improved SAPO-34 Membranes for carbon dioxide purification” invited presentation in the Chemical & Materials Engineering Department at University of Cincinnati (Graduate Seminar Series). Cincinnati, OH. March 5, 2009.
- “Molecular engineered zeolite membranes for light gas separations”. Chemical Engineering Department. ITESM, Monterrey, NL, Mexico, October 2006.
- “Periodic ordered meso and macroporous oxides for nanotechnological applications”. Chemical Engineering Department. University of Ottawa. Ottawa, Canada, July 2006.
- “Photocatalytic degradation of methylene blue on nanocrystalline mesoporous anatase thin films”. Materials Research Institute. U.N.A.M. Morelia, Mexico, December 2005.
- “Functional applications of ordered periodic nanoporous inorganic oxides on different length scales”. Mexican, Petroleum Institute (IMP). Mexico City, May 2004.
- “Phase transformation fundamentals on mesoscopic mixed metal oxides: The vanadium-phosphorous-oxide system”. Materials and Metallurgic Research Institute. UMSNH, Morelia, Mexico, September 2003.
- “Hierarchical design of macro and mesoporous mixed metal oxides for selective oxidation of lower alkanes”. Chemical Engineering Department. Princeton University. Princeton, NJ. March 2003.

Synergistic Activities

- Manuscript Referee for *Chemistry of Materials*, *Journal of Materials Chemistry*, *Journal of Membrane Science*, *Journal of Physical Chemistry B*, *Catalysis Communications*, *ACS-Catalysis*,

ChemCatChem, Industrial & Engineering Chemistry Research, Langmuir, European Journal of Inorganic Chemistry, Materials Chemistry and Physics, Journal of Coordination Chemistry, Dalton Transactions, Electrophoresis, Chemical Communications, Angewandte Chemie, Microporous and Mesoporous Materials, PNAS, Journal of the American Chemical Society, Nature Communications.

- Editorial Board for the *Journal of Materials*, and *Journal of Chemical Technology & Biotechnology*.
- Review ~3 papers/month
- Proposal reviewer for NSF (CBET and GRFP), NEUP-DOE, ACS-PRF
- Development of the graduate course “Functional Nanoporous Materials”. University of Louisville, Chemical Engineering Department. Spring 2010.
- Session Chair, 2010 North American Membrane Society Meeting, Washington D.C. July 2010, “Prefilters and Fiber-based Membranes session”
- External PhD advisor for the Project: “Nanocrystalline titania-alumina for the photo-oxidative degradation of pollutants”. Materials Research Institute, University of Michoacan, Mexico. 2006-2011.

Thesis Advisor

At U.M.S.N.H, Mexico:

- 3 M.S. students: Eugenia E. Macias (Graduated 2004), Azucena Lara (Graduated 2005), Lorena Garcia (Graduated 2005).

At UofL:

- 3 graduated PhD students: Minqi Zhu (2013), Chinmay Deshmane (2011); Surendar Venna (2010).
- 4 graduated MS students: Zhenzhen Xie (2013), Carmen Miralda (2012), Joseph Borhman (2012); Amruta Katty (2009)
- Undergraduate students: More than 15.

At Colorado School of Mines :

- 2 graduated MS students: Xuhui Feng (2016); Kirby Tate (2016)
- 2 graduated PhD students: Zhaowang Zong (2017); Liqiu Yang(2017)

Collaborators

- Shiguang Li (Gas Technology Institute)
- Miao Yu (RPI)
- Nathaniel Rosi (University of Pittsburgh)
- Stephanie Wettstein (Montana State University)
- Praveen Thallapally (PNNL)
- Miguel Banares (CSIC - Instituto de Catalisis, Madrid, Spain)
- Mikel Duke (Victoria University, Australia).
- Jacek Jasinski (University of Louisville)