

# FRIEDERIKE C. JENTOFT (NÉE LANGE)

## PROFESSOR

Department of Chemical Engineering, University of Massachusetts Amherst  
686 North Pleasant Street, 159 Goessmann Laboratory, Amherst 01003-9303, USA  
Phone: +1 (413) 545-6250; Fax +1 (413) 545-1647; Email: fcjentoft@umass.edu

## CURRICULUM VITAE

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### Education and training

- 2005            Facultas Docendi (Habilitation), Physical Chemistry, Humboldt-Universität zu Berlin, Germany  
1994            Dr. rer. nat. (“summa cum laude”), Physical Chemistry, Ludwig-Maximilians-Universität München, Munich, Germany (Advisor: Helmut Knözinger)  
1990            Degree “Diplom-Chemiker – Univ.” (~M.S. equivalent), Ludwig-Maximilians-Universität München (Advisor: Helmut Knözinger)  
1986–1990      Study of Chemistry, Pharmacology and Toxicology, Ludwig-Maximilians-Universität München  
1984–1986      Study of Chemistry, Eberhard-Karls-Universität Tübingen, Germany, “Vordiplom” 1986

### Research and professional experience

- 01/2015–present    Professor, Department of Chemical Engineering, University of Massachusetts Amherst, MA  
10/2008–08/2015    Professor (2012–2015) and Associate Professor (2008–2012), School of Chemical, Biological & Materials Engineering, University of Oklahoma, Norman, OK  
01/1996–09/2008    Research Group Leader (April 1996–Sept. 2008) and Postdoctoral Researcher (Jan. 1996–March 1996) in the Department of Inorganic Chemistry (Director: Robert Schlögl) at the Fritz Haber Institute of the Max Planck Society, Berlin, Germany  
05/1994–12/1995    Postdoctoral Researcher in the Department of Chemical Engineering & Materials Science (Postdoctoral Advisor: Bruce C. Gates), University of California, Davis, CA, USA  
04/1993–04/1994    Research Assistant at Ludwig-Maximilians-Universität München, Germany  
05/1989–02/1993    Associated Collaborator of Siemens AG, Power Generation Group, München, Erlangen, and Redwitz, Germany

### Awards

- 2022            Excellence in Peer Reviewing, American Chemical Society Petroleum Research Fund  
2021            Fellow, American Institute of Chemical Engineers  
2021            Lady Davis Fellowship for Visiting Professors, Technion – Israel Institute of Technology  
2021            Outstanding Senior Faculty Award, College of Engineering, Univ. Mass. Amherst  
2018            Excellence in Catalysis Award, Catalysis Society of Metropolitan New York  
04/2014–08/2015    Anadarko Petroleum Corporation Presidential Professor, University of Oklahoma  
2010            2<sup>nd</sup> Prize for Course Instructors, College of Engineering, University of Oklahoma  
2000            Young Scientists Prize of the *International Association of Catalysis Societies*  
1996            Award for Young Scientists (Carl Zerbe Award) of the *DGMK German Society for Petroleum and Coal Science and Technology*

### Memberships in professional societies

- 2010–present      North American Catalysis Society (via New England / Southwest Catalysis Society)  
2010–present      American Chemical Society  
2008–present      AIChE (American Institute of Chemical Engineers)  
2003–present      Deutscher Hochschulverband (German University Association)  
1999–present      Deutsche Bunsengesellschaft für Physikalische Chemie e.V. (German Bunsen Society for Physical Chemistry)  
1996–present      DGMK (German Society for Sustainable Energy Carriers, Mobility and Carbon Cycles)  
1996–present      DECHEMA Gesellschaft für Chemische Technik und Biotechnologie e.V. (Society for Chemical Engineering and Biotechnology)

## PUBLICATIONS

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### 1. Summary

Edited works:	7 volumes of book series, 2 journal issues
Peer-reviewed articles:	104 published, 1 in revision
Book contributions:	6 published
Other publications:	1 book review, 10 proceedings articles (unreviewed), 3 monographs (theses)
Hirsch index:	<b>36</b> (Web of Science Core Collection) as of August 2022, search for authors "jentoft f* or jentoft pc or (lange f and (knözinger or gates))" <b>41</b> (Google Scholar)

### 2. Edited books

1. "Advances in Catalysis", Volume 58, 330 pages, F.C. Jentoft, Editor; Academic Press (Elsevier), Amsterdam, 2015. ISBN: 9780128021262.
2. "Advances in Catalysis", Volume 57, 434 pages, F.C. Jentoft, Editor; Academic Press (Elsevier), Amsterdam, 2014. ISBN: 9780128001271.
3. "Advances in Catalysis", Volume 56, 382 pages, B.C. Gates and F.C. Jentoft, editors; Academic Press (Elsevier), Amsterdam, 2013. ISBN: 9780124201736.
4. "Advances in Catalysis", Volume 55, 264 pages, B.C. Gates and F.C. Jentoft, editors; Academic Press (Elsevier), Amsterdam, 2012. ISBN: 9780123855169.
5. "Advances in Catalysis", Volume 54, 352 pages, B.C. Gates and H. Knözinger, editors; F.C. Jentoft, Associate Editor, Academic Press (Elsevier), Amsterdam, 2011. ISBN: 9780123877727.
6. "Advances in Catalysis", Volume 53, 644 pages, B.C. Gates and H. Knözinger, editors; F.C. Jentoft, Associate Editor, Academic Press (Elsevier), Amsterdam, 2010. ISBN: 9780123808523.
7. "Advances in Catalysis", Volume 52, 488 pages, B.C. Gates and H. Knözinger, editors; F.C. Jentoft, Associate Editor, Academic Press (Elsevier), Amsterdam, 2009. ISBN: 9780123743367.

### 3. Edited journal issues

1. Topics in Catalysis, 60, 19–20 (2017) 1483–1753. Special Issue "Catalyst Characterization by Vibrational Spectroscopy" in memoriam of Helmut Knözinger  
Guest Editors: *F.C. Jentoft and G. Mestl*  
Editors-in-Chief: H.-J. Freund and G.A. Somorjai.
2. Topics in Catalysis 54, 5–7 (2011) 287–457. Festschrift entitled "Concepts in Catalysis Research", on the occasion of the 70<sup>th</sup> birthday of Bruce C. Gates  
Guest Editors: *F.C. Jentoft and H. Knözinger*  
Editors-in-Chief: N. Kruse and G.A. Somorjai.

### 4. Book chapters and contributions (upon invitation)

1. Solid Acids and Bases, *F.C. Jentoft*, in Comprehensive Inorganic Chemistry II Vol. 7, Eds. Jan Reedijk and Kenneth R. Poeppelmeier, Oxford: Elsevier, Amsterdam, 2013, pp. 205–230.
2. Electronic Spectroscopy: Ultraviolet-Visible and Near-IR Spectroscopy, *F.C. Jentoft*, Characterization of Solid Materials and Heterogeneous Catalysts: From Structure to Surface Reactivity, Eds. M. Che, J.C. Védrine, Wiley-VCH, Weinheim, Germany, 2012, pp. 89–147.
3. UV–vis–NIR Spectroscopy in Catalysis: Theory, Experiment, Analysis and Application under Reactive Conditions, *F.C. Jentoft*, *Advances in Catalysis* 52 (2009) 129–211.
4. Oxo-Anion Modified Oxides, *F.C. Jentoft*, Handbook of Heterogeneous Catalysis, Vol. I, Eds. G. Ertl, H. Knözinger, F. Schüth, J. Weitkamp, 2<sup>nd</sup> edition, Wiley-VCH, Weinheim, Germany, 2008, pp. 262–278.

5. 13 Keywords: Carbocation, DeNO<sub>x</sub>-Reaction, Dowex, Isoelectric Point, Isomerization Catalysts, Micropores, Microporous Solids, Photoinduced Oxidation/Reduction of Water, Probe Molecules, Silica, Solid Acid Catalysis, Solid Base Catalysis, Sulfuric Acid Synthesis, *F.C. Jentoft*, “Catalysis from A to Z - A Concise Encyclopedia”, Eds. B. Cornils, W.A. Herrmann, R. Schlögl, C.-H. Wong, Wiley-VCH, Weinheim, Germany, 2000.
6. Photoelectron Spectroscopy as a Tool for Studying Ceramic Interfaces: A Tutorial, *F.C. Jentoft*, *G. Weinberg*, *U. Wild*, *R. Schlögl*, Proceedings of the Workshop on ‘Grain Boundary Dynamics of Precursor-Derived Ceramics’, in “Precursor-Derived Ceramics”, Eds. J. Bill, F. Wakai, F. Aldinger, Wiley-VCH, Weinheim, Germany, 1999, pp. 175–187.

## 5. Journal articles (with peer review)

1. Elucidating cooperative interactions between grafted amines and tin or titanium sites on silica, *C. Khoury*, *S. Holton*, *D. Shpasser*, *E. Hallo*, *A. Kulkarni*, *F.C. Jentoft*, *O.M. Gazit*, *ACS Catalysis* **12** (2022) 9846–9856.
2. Atmospheric-pressure conversion of CO<sub>2</sub> to cyclic carbonates over constrained dinuclear iron catalyst, *S. Pappuru*, *D. Shpasser*, *R. Carmeli*, *P. Shekhter*, *F.C. Jentoft*, *O.M. Gazit*, *ACS Omega*, **7** (2022) 24656–24661.
3. Selective synthesis of tungsten carbide phases W<sub>2</sub>C and WC as hydrogenation catalysts, *P. Bretzler*, *M. Huber*, *A.A. Rane*, *R.E. Jentoft*, *K. Köhler*, *F.C. Jentoft*, *Journal of Catalysis* **405** (2022) 60–73.
4. Shape-selective synthesis of alkylcyclopentenyl cations in zeolites and spectroscopic distinction of constitutional isomers, *E.D. Hernandez*, *B. Manookian*, *S.M. Auerbach*, *F.C. Jentoft*, *ACS Catalysis* **11** (2021) 12893–12914.
5. Experimental and DFT calculated IR spectra of guests in zeolites: acyclic olefins and host-guest interactions, *B. Manookian*, *E.D. Hernandez*, *M.D. Baer*, *C.J. Mundy*, *F.C. Jentoft*, *S.M. Auerbach*, *Journal of Physical Chemistry C* **124** (2020) 10561–10572.
6. Spectroscopic signatures reveal cyclopentenyl cation contributions in methanol-to-olefins catalysis, *E.D. Hernandez*, *F.C. Jentoft*, *ACS Catalysis* **10** (2020) 5764–5782.
7. Fundamental insights into deactivation by leaching during rhenium-catalyzed deoxydehydration, *B.E. Sharkey*, *F.C. Jentoft*, *ACS Catalysis* **9** (2019) 11317–11328.
8. Poisoning and competitive adsorption effects during phenol hydrogenation on platinum in water-alcohol mixtures, *Z. Liu*, *I.A. Hamad*, *Y. Li*, *Y. Chen*, *S. Wang*, *R.E. Jentoft*, *F.C. Jentoft*, *Applied Catalysis A: General* **585** (2019) 117199.
9. Products of the initial reduction of the Phillips catalyst by olefins, *J. Joseph*, *K.C. Potter*, *M.J. Wulfers*, *E. Schwerdtfeger*, *M.P. McDaniel*, *F.C. Jentoft*, *Journal of Catalysis* **377** (2019) 550–564.
10. Hydrogenation of *o*-cresol at the water/Pt(111) interface, *Y. Li*, *Z. Liu*, *Y. Liu*, *S.P. Crossley*, *F.C. Jentoft*, *S. Wang*, *Journal of Physical Chemistry C* **123** (2019) 5378–5384.
11. Highly selective molybdenum-based catalysts for ring hydrogenation and contraction, *A. Mehdad*, *R.E. Jentoft*, *F.C. Jentoft*, *Applied Catalysis A: General* **569** (2019) 45–56.
12. Single-phase mixed molybdenum-tungsten carbides: synthesis, characterization and catalytic activity for toluene conversion, *A. Mehdad*, *R.E. Jentoft*, *F.C. Jentoft*, *Catalysis Today* **323** (2019) 112–122.
13. Effect of hydrogen coverage on hydrogenation of *o*-cresol on Pt(111), *Y. Li*, *Z. Liu*, *S.P. Crossley*, *F.C. Jentoft*, *S. Wang*, *Applied Surface Science* **443** (2018) 575–580.
14. Intraparticle diffusional effects vs. site effects on reaction pathways in liquid-phase cross aldol reactions, *K. Ponnuru*, *J.C. Manayil*, *H.J. Cho*, *W. Fan*, *K. Wilson*, *F.C. Jentoft*, *ChemPhysChem* **19** (2018) 386–401.
15. New solid oxo-rhenium and oxo-molybdenum catalysts for the deoxydehydration of glycols to olefins, *B.E. Sharkey*, *A.L. Denning*, *F.C. Jentoft*, *R. Gangadhar*, *T.V. Gopaladasu*, *K.M. Nicholas*, *Catalysis Today* **310** (2018) 86–93.
16. Tuning solid catalysts to control regioselectivity in cross aldol condensations with unsymmetrical ketones for biomass conversion, *K. Ponnuru*, *J.C. Manayil*, *H.J. Cho*, *A. Osatiashtiani*, *W. Fan*, *K. Wilson*, *F.C. Jentoft*, *Molecular Catalysis* **458** (2018) 247–260.
17. Single-phase mixed molybdenum-niobium carbides: Synthesis, characterization and multifunctional catalytic behavior in toluene conversion, *A. Mehdad*, *R.E. Jentoft*, *F.C. Jentoft*, *Journal of Catalysis* **351** (2017) 161–173.

18. Octyl co-grafted PrSO<sub>3</sub>H/SBA-15: Tunable hydrophobic solid acid catalysts for acetic acid esterification, *J.C. Manayil, V.C. dos Santos, F.C. Jentoft, M. Granollers Mesa, A.F. Lee, K. Wilson*, ChemCatChem **2** (2017) 2231–2238.
19. Passivation agents and conditions for Mo<sub>2</sub>C and W<sub>2</sub>C: Effect on catalytic activity for toluene hydrogenation, *A. Mehdad, R.E. Jentoft, F.C. Jentoft*, Journal of Catalysis **347** (2017) 89–101.
20. Hydrogenation of *o*-cresol on platinum catalysts: Catalytic experiments and first-principles calculations, *Y. Li, Z. Liu, W. Xue, S.P. Crossley, F.C. Jentoft, S. Wang*, Applied Surface Science **393** (2017) 212–220.
21. Reduction of the Phillips catalyst by various olefins: Stoichiometry, thermochemistry, reaction products and polymerization activity, *K.C. Potter, C.W. Beckerle, F.C. Jentoft, E. Schwerdtfeger, M.P. McDaniel*, Journal of Catalysis **344** (2016) 657–668.
22. Mechanism of *n*-butane skeletal isomerization on H-mordenite and Pt/H-mordenite, *M.J. Wulfers, F.C. Jentoft*, Journal of Catalysis **330** (2015) 507–519.
23. The role of cyclopentadienium ions in methanol-to-hydrocarbons chemistry, *M.J. Wulfers, F.C. Jentoft*, ACS Catalysis **4** (2014) 3521–3532.
24. Deoxydehydration of glycols catalyzed by carbon-supported perhenate, *A.L. Denning, H. Dang, Z. Liu, K.M. Nicholas, F.C. Jentoft*, ChemCatChem **5** (2013) 3567–3570.
25. Identification of carbonaceous deposits formed on H-mordenite during alkane isomerization, *M.J. Wulfers, F.C. Jentoft*, Journal of Catalysis **307** (2013) 204–213.
26. Quantitative analysis of IR intensities of alkanes adsorbed on solid acid catalysts, *F.C. Jentoft, J. Kröhnert, I.R. Subbotina, V.B. Kazansky*, Journal of Physical Chemistry C **117** (2013) 5873–5881.
27. Evolution of carbonaceous deposits on H-Mordenite and Pt-doped H-mordenite during *n*-butane conversion, *M.J. Wulfers, G. Tzolova-Müller, J.I. Villegas, D.Yu. Murzin, F.C. Jentoft*, Journal of Catalysis **296** (2012) 132–142.
28. Redox properties of manganese-containing zirconia solid solution catalysts analyzed by in situ UV–vis spectroscopy and crystal field theory, *S.I. Klokishner, O. Reu, C.E. Chan Than, F.C. Jentoft, R. Schlögl*, Journal of Physical Chemistry A **115** (2011) 8100–8112.
29. The balance between reactivity and stability of modified oxide surfaces illustrated by the behavior of sulfated zirconia catalysts, *B.S. Klose-Schubert, R.E. Jentoft, F.C. Jentoft*, Topics in Catalysis **54** (2011) 398–414.
30. Adsorption–desorption equilibrium investigations of *n*-butane on nanocrystalline sulfated zirconia thin films, *R. Lloyd, T.W. Hansen, W. Ranke, F.C. Jentoft, R. Schlögl*, Applied Catalysis A: General **391** (2011) 215–224.
31. Sol–gel prepared nanoscopic metal fluorides - a new class of tunable acid-base catalysts, *S. Wuttke, S.M. Coman, J. Kröhnert, F.C. Jentoft, E. Kemnitz*, Catalysis Today **152** (2010) 2–10.
32. Characterization of catalysts in their active state by adsorption microcalorimetry: experimental design and application to sulfated zirconia, *S. Wrabetz, X. Yang, G. Tzolova-Müller, R. Schlögl, F.C. Jentoft*, Journal of Catalysis **269** (2010) 351–358.
33. Activation of dihydrogen on supported and unsupported silver catalysts, *J. Hohmeyer, E. Kondratenko, M. Bron, J. Kröhnert, F.C. Jentoft, R. Schlögl, P. Claus*, Journal of Catalysis **269** (2010) 5–14.
34. In situ surface characterization of the intermetallic compound PdGa–A highly selective hydrogenation catalyst, *K. Kovnir, M. Armbrüster, D. Teschner, T. Venkov, L. Szentmiklósi, F.C. Jentoft, A. Knop-Gericke, Yu. Grin, R. Schlögl*, Surface Science **603** (2009) 1784–1792.
35. In-situ investigation of gas phase radical chemistry in the catalytic partial oxidation of methane on platinum, *M. Geske, K. Pelzer, R. Horn, F.C. Jentoft, R. Schlögl*, Catalysis Today **142** (2009) 61–69.
36. Integral absorption coefficients of C–H stretching bands in IR spectra of ethane adsorbed by cationic forms of Y zeolite, *I.R. Subbotina, V.B. Kazansky, J. Kröhnert, F.C. Jentoft*, Journal of Physical Chemistry A **113** (2009) 839–844.
37. Catalytically active gold clusters and nanoparticles for CO oxidation, *A.N. Pestryakov, N. Bogdanchikova, A. Simakov, I. Tuzovskaya, F. Jentoft, A. Simakov*, Surface Science **601** (2007) 3792–3795.
38. Partial pressure dependent in-situ spectroscopic study on the preferential CO oxidation in hydrogen (PROX) over Pt/ceria catalysts, *D. Teschner, A. Wootsch, O. Pozdnyakova-Tellinger, J. Kröhnert, E.M. Vass, M. Hävecker, S. Zafeirotas, P. Schnörch, F.C. Jentoft, A. Knop-Gericke, R. Schlögl*, Journal of Catalysis **249** (2007) 316–325.

39. A new approach to well-defined, stable and site-isolated catalysts, *K. Kovnir, M. Armbrüster, D. Teschner, T. Venkov, F.C. Jentoft, A. Knop-Gericke, Yu. Grin, R. Schlögl*, Science and Technology of Advanced Materials **8** (2007) 420–427.
40. Surface-water assisted preferential CO oxidation reaction (PROX) on Pt/CeO<sub>2</sub> catalyst, *O. Pozdnyakova-Tellinger, D. Teschner, J. Kröhnert, F.C. Jentoft, A. Knop-Gericke, R. Schlögl, A. Wootsch*, Journal of Physical Chemistry C **111** (2007) 5426–5431.
41. Steam reforming of methanol over copper-containing catalysts: influence of support material on microkinetics, *B. Frank, F.C. Jentoft, H. Soerijanto, J. Kröhnert, R. Schlögl, R. Schomäcker*, Journal of Catalysis **246** (2007) 177–192.
42. Redox properties of vanadium ions in SBA-15 supported vanadium oxide: an FTIR spectroscopic study, *T.V. Venkov, C. Hess, F.C. Jentoft*, Langmuir **23** (2007) 1768–1777.
43. Silver as acrolein hydrogenation catalyst: intricate effects of catalyst nature and reactant partial pressures, *M. Bron, D. Teschner, A. Knop-Gericke, F.C. Jentoft, J. Kröhnert, J. Hohmeyer, C. Volckmar, B. Steinbauer, R. Schlögl, P. Claus*, Physical Chemistry Chemical Physics **2** (2007) 3559–3569 and a correction in **10** (2008) 7325–7327.
44. Activation and isomerization of *n*-butane on sulfated zirconia model systems - An integrated study across the materials and pressure gaps, *C. Breitkopf, H. Papp, X. Li, R. Olindo, J.A. Lercher, R. Lloyd, S. Wrabetz, F.C. Jentoft, K. Meinel, S. Förster, K.-M. Schindler, H. Neddermeyer, W. Widdra, A. Hofmann, J. Sauer*, Physical Chemistry Chemical Physics **2** (2007) 3600–3618.
45. Intensities of C-H IR stretching bands of ethane and propane adsorbed by zeolites as a new spectral criterion of their chemical activation via vibrational polarization, *V.B. Kazansky, I.R. Subbotina, F.C. Jentoft, R. Schlögl*, Journal of Physical Chemistry B **110** (2006) 17468–17477.
46. In situ spectroscopic investigation of activation, start-up and deactivation of promoted sulfated zirconia catalysts, *B.S. Klose, F.C. Jentoft, P. Joshi, A. Trunschke, R. Schlögl, I.R. Subbotina, V.B. Kazansky*, Catalysis Today **116** (2006) 121–131.
47. Intensities of combination IR bands as indication of a concerted mechanism of proton transfer from acidic hydroxyl groups in zeolites to ethylene hydrogen-bonded by protons, *V.B. Kazansky, I.R. Subbotina, F.C. Jentoft*, Journal of Catalysis **240** (2006) 66–72.
48. A molecular beam mass spectrometer equipped with a catalytic wall reactor for in situ studies in high temperature catalysis research, *R. Horn, K. Ihmann, J. Ihmann, F.C. Jentoft, M. Geske, A. Taba, K. Pelzer, R. Schlögl*, Review of Scientific Instruments **77** (2006) 054102.
49. Unusual infrared spectrum of ethane adsorbed by gallium oxide, *V.B. Kazansky, I.R. Subbotina, A.A. Pronin, R. Schlögl, F.C. Jentoft*, Journal of Physical Chemistry B **110** (2006) 7975–7978.
50. *n*-Butane isomerization catalyzed by sulfated zirconia nanocrystals supported on silica or  $\gamma$ -alumina, *X. Yang, R.E. Jentoft, F.C. Jentoft*, Catalysis Letters **106** (2006) 195–203.
51. Preferential CO oxidation in hydrogen (PROX) on ceria supported catalysts: PART II. Oxidation state and surface species on Pd/CeO<sub>2</sub> under reaction conditions, suggested reaction mechanism, *O. Pozdnyakova, D. Teschner, A. Wootsch, J. Kröhnert, B. Steinbauer, H. Sauer, Z. Paál, L. Toth, F.C. Jentoft, A. Knop-Gericke, R. Schlögl*, Journal of Catalysis **237** (2006) 17–28.
52. Preferential CO oxidation in hydrogen (PROX) on ceria supported catalysts: PART I. Oxidation state and surface species on Pt/CeO<sub>2</sub> under reaction conditions, *O. Pozdnyakova, D. Teschner, A. Wootsch, J. Kröhnert, B. Steinbauer, H. Sauer, Z. Paál, L. Toth, F.C. Jentoft, A. Knop-Gericke, R. Schlögl*, Journal of Catalysis **237** (2006) 1–16.
53. Rapid genesis of active phase during calcination of promoted sulfated zirconia catalysts, *A.H.P. Hahn, R.E. Jentoft, T. Ressler, G. Weinberg, R. Schlögl, F.C. Jentoft*, Journal of Catalysis **236** (2005) 324–334.
54. Effect of Mn and Fe on the reactivity of sulfated zirconia towards H<sub>2</sub> and *n*-butane: A diffuse reflectance IR spectroscopic investigation, *B.S. Klose, F.C. Jentoft, R. Schlögl, I.R. Subbotina, V.B. Kazansky*, Langmuir **21** (2005) 10564–10572.
55. Formation of gold nanoparticles in zeolites, *A. Pestryakov, I. Tuzovskaya, E. Smolentseva, N. Bogdanchikova, F.C. Jentoft, A. Knop-Gericke*, International Journal of Modern Physics B **19** (2005) 2321–2326.
56. In situ diffuse reflectance IR spectroscopic investigation of promoted sulfated zirconia catalysts during *n*-butane isomerization, *B.S. Klose, F.C. Jentoft, R. Schlögl*, Journal of Catalysis **233** (2005) 68–80.

57. Morphology-controlled reactivity of carbonaceous materials towards oxidation, J.-O. Müller, D.S. Su, R.E. Jentoft, J. Kröhnert, F.C. Jentoft, R. Schlögl, *Catalysis Today* **102–103** (2005) 259–265.
58. Interaction between sulfated zirconia and alkanes: Prerequisites for active sites – formation and stability of reaction intermediates, X. Li, K. Nagaoka, L.J. Simon, J.A. Lercher, S. Wrabetz, F.C. Jentoft, C. Breitenkopf, S. Matysik, H. Papp, *Journal of Catalysis* **230** (2005) 214–225.
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60. IR spectroscopic investigation of heteropolymolybdate catalysts: Acidic properties and reactivity towards propene, F.C. Jentoft, J. Kröhnert, R. Schlögl, *Zeitschrift für Physikalische Chemie* **219** (2005) 1019–1045.
61. XAS in situ cell for measurements of Mn and Fe promoted sulfated zirconia catalysts, R.E. Jentoft, A. Hahn, F.C. Jentoft, T. Ressler, *Physica Scripta* **T115** (2005) 794–797.
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63. Optical bands of dodecanuclear compounds  $H_4PVMo_{11}O_{40} \cdot y H_2O$  with Keggin structure: Semiclassical vibronic model, S. Klokishner, J. Melsheimer, F.C. Jentoft, R. Schlögl, *Physical Chemistry Chemical Physics* **6** (2004) 2066–2082.
64. Gas phase contributions to the catalytic formation of HCN from  $CH_4$  and  $NH_3$  over Pt: An in situ study by molecular beam mass spectrometry with threshold ionization, R. Horn, G. Mestl, M. Thiede, F.C. Jentoft, P.M. Schmidt, M. Bewersdorf, R. Weber, R. Schlögl, *Physical Chemistry Chemical Physics* **6** (2004) 4514–4521.
65. The structure of molybdenum-heteropoly-acids under conditions of gas phase selective oxidation catalysis: A Multi-Method In Situ Study, F.C. Jentoft, S. Klokishner, J. Kröhnert, J. Melsheimer, T. Ressler, O. Timpe, J. Wienold, R. Schlögl, *Applied Catalysis A: General* **256** (2003) 291–317.
66. Reaction pathways in *n*-pentane conversion catalyzed by tungstated zirconia: Effects of platinum in the catalyst and hydrogen in the feed, S. Kuba, P. Lukinskas, R. Ahmad, F.C. Jentoft, R.K. Grasselli, B.C. Gates, H. Knözinger, *Journal of Catalysis* **219** (2003) 376–388.
67. Isomerization of *n*-butane and of *n*-pentane in the presence of sulfated zirconia: formation of surface deposits investigated by in situ UV–vis diffuse reflectance spectroscopy, R. Ahmad, J. Melsheimer, F.C. Jentoft, R. Schlögl, *Journal of Catalysis* **218** (2003) 365–374.
68. Mechanical stress induced activity and phase composition changes in sulfated zirconia catalysts, B.S. Klose, R.E. Jentoft, A. Hahn, T. Ressler, J. Kröhnert, S. Wrabetz, X. Yang, F.C. Jentoft, *Journal of Catalysis* **217** (2003) 487–490.
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83. Spectroscopic and microscopic characterization of iron- and/or manganese-promoted sulfated zirconia, *M. Scheithauer, E. Bosch, U.A. Schubert, H. Knözinger, T.-K. Cheung, F.C. Jentoft, B.C. Gates, B. Tesche*, Journal of Catalysis **177** (1998) 137–146.
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## 6. Proceedings articles with peer review

98. IR extinction coefficients as a criterion for chemical activation upon adsorption: propene interaction with cationic forms of Y zeolite, *I.R. Subbotina, V.B. Kazansky, F.C. Jentoft, R. Schlögl*, *Zeolites and Related Materials: Trends, Targets and Challenges, Proceedings of 4<sup>th</sup> International FEZA Conference*, Eds. A. Gedeon, P. Massiani and F. Babboneau, *Studies in Surface Science and Catalysis* **174B** (2008) 849–852.
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## 7. Proceedings articles and technical reports (unreviewed)

105. Decarboxylation of furfural on Pd(111): Ab initio molecular dynamics simulations, *W. Xue, H. Dang, D. Shields, Y. Liu, F. Jentoft, D. Resasco, S. Wang*, *Bulletin of the American Physical Society, APS March Meeting 2013* (March 18–22, 2013, Baltimore, MD), Volume 58, Number 1.
106. Adsorption and subsequent surface reactions of bifunctional compounds from bio-oil vapors on oxide supports, *C. Vaddepalli, F.C. Jentoft*, *Proceedings of the 2011 AIChE Annual Meeting*, Minneapolis, Oct. 16–21, 2011.
107. Sulfated zirconia catalysts: structure and performance relationship, a TEM study, *C. Meyer, D. Su, N. Hensel, F. C. Jentoft, R. Schlögl*, in: Richter S., Schwedt A. (eds) *EMC 2008 14<sup>th</sup> European Microscopy Congress* 1–5 September 2008, Aachen, Germany, Springer, Berlin, Heidelberg (2008) 237–238.
108. Electronmicroscopical characterization of zeolite structures, *B. Tesche, F.C. Jentoft, R. Schlögl, S.R. Bare, L.T. Nemeth, S. Valencia, A. Corma*, Extended abstract of a paper presented at MC 2007, 33<sup>rd</sup> DGE Conference in Saarbrücken, Germany, September 2 – September 7, 2007, *Microscopy and Microanalysis* **13**, S03 (2007) 264–265.
109. Novel preparation steps and imaging procedures suitable for electronmicroscopical characterization of zeolite structures, *B. Tesche, F.C. Jentoft, R. Schlögl, S.R. Bare, L.T. Nemeth, S. Valencia, A. Corma*, Extended abstract of a paper presented at MC 2007, 33<sup>rd</sup> DGE Conference in Saarbrücken, Germany, September 2 – September 7, 2007, *Microscopy and Microanalysis* **13**, S02 (2007) 560–561.
110. Preferential oxidation of CO over supported and alloy catalysts in H<sub>2</sub>-rich gas for fuel cell application, *D. Teschner, E. Vass, S. Zafeirotas, P. Schnörch, M. Hävecker, A. Knop-Gericke, H. Sauer, J. Kröhnert, F.C. Jentoft, R. Schlögl, G. Hutchings, O. Pozdnyakova-Tellinger, K. Lazar, A. Wootsch*, *BESSY Annual Report 2006* (2007) 89–91.



111. Preferential CO oxidation in H<sub>2</sub> (PROX) on Pt/CeO<sub>2</sub> catalyst, high-pressure xps and in-situ DRIFTS study *D. Teschner, E. Vass, S. Zafeirotas, P. Schnörch, M. Hävecker, A. Knop-Gericke, H. Sauer, J. Kröhnert, F.C. Jentoft, R. Schlögl, O. Pozdnyakova, A. Wootsch*, BESSY Annual Report 2005 (2006) 254–256.
112. Deactivation and regeneration of mn-promoted sulfated zirconia alkane isomerization catalysts: An In-situ spectroscopic study, *B.S. Klose, R.E. Jentoft, T. Ressler, P. Joshi, A. Trunschke, R. Schlögl, F.C. Jentoft*, Proceedings of DGMK International Conference: C<sub>4</sub>/C<sub>5</sub>-Hydrocarbons: Routes to higher value-added products, Munich, Germany, Oct. 13–15, 2004, ISBN 3-936418-23-3, pp. 23–30.
113. In situ spectroscopic study of isomerization of light alkanes over sulfated zirconia catalysts, *X. Yang, R. Ahmad, J. Melsheimer, B. Klose, F.C. Jentoft*, Proceedings of the DGMK-Conference "Chances for Innovative Processes at the Interface between Refining and Petrochemistry", Berlin, Germany, Oct. 9–11, 2002, ISBN 3-931850-98-6, pp. 217–224.
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## 8. Other publications

### *Book reviews*

115. In-Situ Spectroscopy in Heterogeneous Catalysis, edited by James F. Haw, *F.C. Jentoft*, *Angewandte Chemie* **115** (2003) 266–267 and *Angewandte Chemie International Edition* **42**,3 (2003) 256–257.

### *Articles aimed at a general audience*

116. Gedanken über das Chemikerdasein (Reflections on being a chemist), *F.C. Jentoft*, in "Schulwege", Jubiläumsbuch des Uhland-Gymnasiums (Collection of articles published as a book on the occasion of the 150<sup>th</sup> anniversary of the school), Ed. Uhland-Gymnasium Tübingen, 2001, p. 269–276.

### *Monographs*

- ◆ Sulfated Zirconia Alkane Isomerization Catalysts: A Treatise, *F.C. Jentoft*, Habilitationsschrift (Habilitation thesis), Humboldt-Universität zu Berlin, Germany, 2005, pages: 245.
- ◆ Arsenvergiftung von DeNO<sub>x</sub>-Katalysatoren (Arsenic poisoning of NO<sub>x</sub> catalysts), *F. Lange*, Doctoral Thesis, Ludwig-Maximilians-Universität München, Germany, 1994, pages: 193.
- ◆ Charakterisierung von Modellsystemen zur Arsenvergiftung an DeNO<sub>x</sub>-Katalysatoren (Characterization of model systems for the understanding of arsenic poisoning of NO<sub>x</sub> catalysts), *F. Lange*, Diplomarbeit (Thesis for degree "Diplom-Chemikerin"), Ludwig-Maximilians-Universität München, Germany, 1990, pages: 114.

## PRESENTATIONS

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### 1. Summary

Invited seminars:	52
Invited oral conference presentations:	29
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### 2. Invited seminars

1. Formation and deactivation of active sites on catalyst surfaces: Insights from in situ spectroscopy, Seminar of the Wolfson Dept. of Chemical Engineering, Technion – Israel Institute of Technology, Haifa, Israel, Nov. 24, 2021.
2. Spectroscopic identification of surface intermediates in acid catalysis, Virtual Meeting of the Michigan Chapter of the North American Catalysis Society, Nov. 11, 2020.
3. Spectroscopic observation of surface species and reactions pathways on solid acid catalysts, Virtual Chemical Engineering Colloquium, Worcester Polytechnic Institute, Worcester, MA, USA, Sept. 30, 2020.
4. Spectroscopic observation of surface species and their reactions on solid acid catalysts, Dept. of Chemical and Biomolecular Engineering, Univ. of Houston, Houston, TX, USA, Nov. 1, 2019.
5. Spectroscopic analysis of acid-catalyzed surface reactions, SABIC Global Corporate Research, Sugar Land, TX, USA, Oct. 31, 2019.
6. Controlling selectivity in aldol reactions via heterogeneous catalysis, Dept. of Chemical Engineering, Univ. of New Hampshire, Durham, NH, USA, Oct. 18, 2019.
7. Observation of surface species and reactions pathways on solid acids, Seminar of the Dept. of Inorganic Chemistry, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin-Dahlem, Germany, Sept. 30, 2019.
8. Controlling selectivity in aldol reactions by tuning catalyst acid-base properties and porosity, Monthly Meeting of the Catalysis Club of Chicago, Chicago, IL, USA, Nov. 12, 2018.
9. Controlling reaction pathways in heterogeneously catalyzed aldol condensations, International Flavors and Fragrances, Hazlet, NJ, USA, May 17, 2018.
10. *Excellence in Catalysis Award Lecture*: Tracing reaction steps on solid acid catalysts by spectroscopy, Monthly Meeting of The Catalysis Society of Metropolitan New York, Somerset, NJ, USA, May 16, 2018.
11. Tuning sites, porosity and solvent to steer selectivity in heterogeneously catalyzed aldol reactions, Dept. of Chemical and Biochemical Engineering, Rutgers Univ., Piscataway, NJ, USA, Nov. 9, 2017.
12. Spectroscopic analysis of hydrocarbon moieties on solid acid surfaces, ExxonMobil, Annandale, NJ, USA, July 11, 2017.
13. Watching catalysts at work: Hydrocarbon species and reaction pathways on solid acid surfaces, Catalysis Research Center Colloquium, Technical Univ. of Munich, Germany, March 13, 2017.
14. Single phase mixed metal carbides: Synthesis and catalytic properties, Catalysis Seminar, Dept. of Chemical & Biomolecular Engineering, UC Berkeley, USA, Nov. 18, 2016.
15. Single phase mixed metal carbides and their catalytic properties, School of Engineering & Applied Science, Aston Univ., Birmingham, UK, March 16, 2016.
16. Tracking hydrocarbon chemistry on surfaces with spectroscopy, UOP LLC – a Honeywell Company, Des Plaines, IL, USA, May 29, 2015.
17. Spectroscopic analysis of hydrocarbon chemistry on surfaces, Dept. of Chemical and Biomolecular Engineering, Lehigh Univ., Bethlehem, PA, April 22, 2015.
18. Reactivity of hydrocarbon species on solid acid catalysts, Clariant Produkte (Deutschland) GmbH, Bruckmühl, Germany, Sept. 22, 2014.
19. Hydrodeoxygenation of phenolic compounds in the liquid phase on platinum and palladium catalysts, Virtual seminar of the Catalysis Center for Energy Innovation (An Energy Frontier Research Center funded by the Dept. of Energy), Univ. of Delaware, Newark, DE, USA, March 25, 2014.

20. Reaction pathways on solid acid surfaces: From understanding to control, Dept. of Chemical Engineering, Univ. of Massachusetts, Amherst, MA, USA, March 11, 2014.
21. Reactive remnants on catalyst surfaces, Chevron-Phillips Chemical Company, Bartlesville, OK, USA, Feb. 24, 2014.
22. Insight into catalytic hydrocarbon transformations from kinetics and in situ spectroscopy, Center for Catalytic Science and Technology, Univ. of Delaware, Newark, DE, USA, Sept. 20, 2013.
23. Reactions of alkanes and alkenes on solid acid surfaces, Chevron-Phillips Chemical Company, Bartlesville, OK, USA, June 14, 2011.
24. In situ spectroscopic investigations of dispersed metal and bifunctional Catalysts, Umicore AG & Co. KG, Hanau-Wolfgang, Germany, April 14, 2011.
25. Spektroskopische Untersuchungen der Reaktionen von Alkanen und Alkenen an Zeolithen (Spectroscopic investigations of the reactions of alkanes and alkenes on zeolites), Colloquium of the Eduard-Zintl Institute for Inorganic and Physical Chemistry, Technische Univ. Darmstadt, Germany, April 13, 2011.
26. Activation and conversion of alkanes and alkenes on acid catalysts, ExxonMobil Research and Engineering Company, Annandale, NJ, USA, June 10, 2010.
27. Hydrocarbon conversion on solid acid catalysts, Oklahoma State Univ., Stillwater, OK, USA, Feb. 26, 2009.
28. Saure Festkörperkatalysatoren: Neue Materialien und zukünftige Herausforderungen (Solid acid catalysts: New materials and future challenges), TU Bergakademie Freiberg, Germany, Institutskolloquium, Institut für Energieverfahrenstechnik und Chemieingenieurwesen, May 21, 2008.
29. Alkane activation and conversion on solid oxide catalysts, Univ. of Oklahoma, Norman, OK, USA, March 11, 2008.
30. The chemistry of low temperature alkane isomerization catalysts, Univ. of Oklahoma, Norman, OK, USA, June 15, 2007.
31. A fundamental approach to the development of novel alkane isomerization catalysts, Dept. of Chemistry, Univ. of Reading, UK, June 4, 2007.
32. Sulfated zirconia as a starting point in the quest for new alkane isomerization catalysts, Süd-Chemie AG, Bruckmühl, Germany, Feb. 23, 2007.
33. Modern alkane isomerization catalysts: complex materials for a simple reaction, Laboratory of Industrial Chemistry, Åbo Akademi Univ. Turku, Finland, Nov. 23, 2006.
34. Analyse eines variablen Katalysators: Reaktivität von promotiertem Zirkoniumoxid (Analysis of a variable catalyst: reactivity of promoted zirconia), Fakultät für Chemie und Mineralogie der Univ. Leipzig, Germany, Jan. 10, 2006.
35. Reactivity of promoted sulfated zirconia isomerization catalysts, Catalysis Seminar, Univ. of California, Berkeley, CA, USA, Oct. 7, 2005.
36. Isomerisierungskatalysatoren aus sulfatiertem Zirkoniumdioxid: Präparation, Charakterisierung und in situ Untersuchungen (Sulfated zirconia isomerization catalysts: Preparation, characterization and in situ investigations), Institutskolloquium Technische Chemie, Technische Univ. Darmstadt, Germany, May 3, 2005.
37. Role of cationic promoters in sulfated zirconia catalysts for *n*-butane isomerization, Seminar of the Dept. of Chemical and Petroleum Engineering, Univ. of Pittsburgh, Pittsburgh, PA, USA, April 25, 2005.
38. Manganese and iron as promoters of sulfated zirconia isomerization catalysts, Seminar at UOP LLC, Des Plaines, IL, USA, April 22, 2005.
39. Aufklärung der Wirkungsweise von Festkörperkatalysatoren durch Infrarotspektroskopie (Elucidation of solid state catalyst operation using infrared spectroscopy), Technische Univ. Berlin, Germany, April 8, 2005.
40. Modifizierte Zirkoniumdioxide – interessante Katalysatoren für die Alkanisomerisierung (Modified zirconias – interesting catalysts for alkane isomerization), Kolloquium des Instituts für Chemie, Humboldt-Univ. zu Berlin, Germany, Oct. 20, 2004.
41. Reaktivität von Festkörperkatalysatoren - Beteiligung der "inaktiven" Komponenten ZrO<sub>2</sub> und SiO<sub>2</sub> (Reactivity of solid state catalysts – participation of the "inactive" components ZrO<sub>2</sub> and SiO<sub>2</sub>), Fakultät für Mathematik und Naturwissenschaften II, Friedrich-Alexander-Univ. Erlangen-Nürnberg, Germany, June 23, 2004.

42. Characterization of surface sites using ir-spectroscopy and microcalorimetry, Laboratoire des Matériaux, Surfaces et Procédés pour la Catalyse, Unité Mixte du CNRS, Ecole Européenne de Chimie, Polymères et Matériaux, Université Louis Pasteur Strasbourg, France, Feb. 18, 2004.
43. Sulfatiertes Zirkoniumdioxid als Katalysator für die Skelettisomerisierung von Alkanen (Sulfated zirconia as a catalyst for the skeletal isomerization of alkanes), Kolloquium des Instituts für Technische Chemie, Univ. Leipzig, Germany, April 15, 2003.
44. Zirkoniumdioxidkatalysatoren für die Alkanisomerisierung (Zirconia catalysts for alkane isomerization), Physikalische Chemie, Univ. Bremen, Germany, April 18, 2002.
45. Preparation, activity, and structural stability of promoted sulfated Zirconia, Seminar of Prof. Dr. Roel Prins' group (ETH Zürich), San Bernardino, Switzerland, Feb. 11–14, 2001.
46. Neue Erkenntnisse über Katalysatoren aus sulfatiertem Zirkonoxid (New findings on sulfated zirconia catalysts), Physikalisch-Chemisches Kolloquium, Ludwig-Maximilians-Univ. München, Germany, Jan. 12, 2001.
47. Neue Erkenntnisse über Katalysatoren aus sulfatiertem Zirkonoxid (New findings on sulfated zirconia catalysts), Fachinstitut für Physikalische und Theoretische Chemie, Humboldt-Univ. zu Berlin, Germany, Oct. 26, 2000.
48. Charakterisierung von Zirkonoxidkatalysatoren (Characterization of zirconia catalysts), Seminar für fortgeschrittene Studenten, Diplomanden und Doktoranden am Anorganisch-Chemischen Institut der Technische Univ. München, Germany, May 26, 2000.
49. Präparation dünner Zirkonoxidschichten aus wässrigem Medium (Preparation of thin zirconia films from aqueous medium), Physikalisch-Chemisches Kolloquium der Univ. Stuttgart, Germany, Dec. 15, 1998.
50. Sulfatierte Zirkonoxide: Saure Katalysatoren? (Sulfated zirconias – acid catalysts?), Seminar über Experimentelle und Theoretische Aspekte der Oberflächenchemie, Freie Univ. Berlin, Germany, Dec. 2, 1998.
51. Sulfatiertes Zirkonoxid - ein Einblick in Katalyse und Charakterisierung (Sulfated zirconia – insight into catalysis and characterization), Hoechst AG, Frankfurt, Germany, April 1, 1997.
52. Arsenic as a poison for SCR catalysts, Seminar at the Dept. of Chemical Engineering & Materials Science, Univ. of California at Davis, Davis, CA, USA, May 5, 1995.

### 3. Invited lectures at conferences and symposia

1. Analogies in acid catalysis: Unsaturated carbenium ions in liquid, solid and gas phase environments, American Chemical Society Spring Meeting, San Diego, CA, USA, March 20–24, 2022.
2. The potential of aldol chemistry to deliver various classes of products, #ChemistsLive ACS Cross-Division Virtual Live Content Event, Sept. 25, 2020.
3. *Keynote Lecture*: Reaction sequences on solid acid surfaces elucidated by in situ spectroscopy, 26<sup>th</sup> North American Catalysis Society Meeting, Chicago, IL, June 23–28, 2019.
4. Carbocation chemistry on solid acid catalysts observed by in situ spectroscopy, Operando Spectroscopy for Catalysis Symposium, 256<sup>th</sup> American Chemical Society National Meeting, Boston, MA, USA, August 19–23, 2018.
5. Spectroscopic observation of reaction sequences on solid acid catalysts, Catalysis Workshop East, Hancock, MA, USA, Aug. 13–17, 2018.
6. Regioselectivity and chemoselectivity in heterogeneously catalyzed cross-aldol condensations with unsymmetrical ketones, Catalytic Conversion of Biomass Derived Molecules to Chemicals & Fuels Symposium, 255<sup>th</sup> American Chemical Society National Meeting, New Orleans, LA, USA, March 18–22, 2018.
7. *Keynote Lecture*: Tuning solid catalysts for aldol reactions, 4<sup>th</sup> International Congress on Catalysis for Biorefineries (*CatBIOR*), Lyon, France, Dec. 11–15, 2017.
8. Single phase mixed metal carbides: synthesis and catalytic properties, Energy & Fuels Storch Award in Fuel Science: Symposium in honor of Umit S. Ozkan, 254<sup>th</sup> ACS National Meeting, Washington, DC, USA Aug. 20–24, 2017.
9. *Keynote Lecture*: Spectroscopic observation of hydrocarbon reactions on acid sites, 8<sup>th</sup> International Symposium on Acid-Base Catalysis, Rio De Janeiro, Brazil, May 7–10, 2017.

10. *Plenary Lecture*: Developing catalytic processes for deoxygenation of biomass-derived feedstocks: vicinal diols to olefins, The 8<sup>th</sup> Eastern Mediterranean Chemical Engineering Conference, Haifa, Israel, Feb. 26–March 1, 2017.
11. Heterogeneously catalyzed single-step conversion of glycols to olefins, Symposium on Novel Catalysts for Energy and Environmental Issues, Sapporo, Japan, June 30–July 1, 2016.
12. *Keynote Lecture*: Synthesis and catalytic properties of single phase mixed metal carbides, 2016 Annual Symposium of The Catalysis Society of Metropolitan New York, Rutgers University, New Brunswick, NJ, USA, March 23, 2016.
13. Insights into the catalytic chemistry of carbides and zeolites, International Symposium on Inorganic Insights into Catalysis on the Occasion of the 60<sup>th</sup> Birthday of Robert Schlögl, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, Germany, July 3–4, 2014.
14. Hydrocarbon species on solid acid catalysts: the good, the bad and the innocent, 2014 Gordon Conference in Catalysis, Colby-Sawyer College, New London, NH, USA, June 22–27, 2014.
15. Short course: IR and UV–vis spectroscopy of solid catalysts in contact with liquids, The 25<sup>th</sup> Biennial Organic Reactions Catalysis Society Meeting, Tucson, AZ, USA, March 2–6, 2014.
16. Do olefins ru(i)n the show in paraffin isomerization? Northeast Corridor Zeolite Association Meeting, Philadelphia, PA, USA, Dec. 14, 2012.
17. Catching the fish in the hydrocarbon pool, 2011 DOE/BES Catalysis Science Program Meeting "Frontiers in Catalysis at Interfaces and Condensed Media", Annapolis, MD, USA, Oct. 2–5, 2011.
18. Adsorption and conversion of pyrolysis oil compounds, Summer School "Energy and Materials from the Sun", Rolduc Abbey, Kerkrade, The Netherlands, June 20–23, 2011.
19. Kinetic and in situ UV–vis–NIR spectroscopic investigation of *n*-butane isomerization on H-mordenite and Pt/H-mordenite, 17<sup>th</sup> Rideal Conference, Cardiff, UK, April 19–21, 2011.
20. Acid and bifunctional catalysts for hydrocarbon activation and conversion, International Symposium "Frontiers in Heterogeneous Catalysis", Catalysis Research Center Munich, Germany, Oct. 22–23, 2010.
21. Stabilization of catalytic alkane isomerization, Annual Spring Meeting of the Southwest Catalysis Society, Houston, TX, USA, March 12, 2010.
22. *Plenary lecture*: Alkane conversion on sulfated zirconia and zeolite catalysts, Second IDECAT Conference on Catalysis: "Concepts, Complexity and Diversity in Catalysis", Porquerolles, France, May 31–June 5, 2008.
23. Zirconium oxide – a variable catalyst component, Microelectronics meets Catalysis: Innovative Oxide Materials, Hanse Wissenschaftskolleg HWK at Delmenhorst, Germany, July 20–21, 2006.
24. Effect of cationic promoters on sulfated zirconia catalysts, Science and Art in Europe: Symposium "Catalysis: Nanotechnology with a Past", Berlin, Germany, May 22–24, 2005.
25. In situ vibrational spectroscopy of reactants and probe molecules on oxide catalysts, CECAM Workshop "In situ atomic scale characterization of surfaces under high pressures: recent advances in experiment and theory", CECAM Lyon, France, Nov. 4–6, 2004.
26. Sulfated zirconia catalysts for alkane isomerization: Recent progress, ExxonMobil European Science & Engineering Program (ESEP), European Award Symposium, Machelen, Belgium, Dec. 4, 2003.
27. Charakterisierung von Festkörperoberflächen mit Hilfe von Sondenmolekülen (Characterization of surfaces of solids with the help of probe molecules), 10. Tagung Festkörperanalytik, Vienna, Austria, July 5–7, 1999.
28. *Carl Zerbe Award* lecture: Reaktionen kurzketziger Alkane, initiiert durch promotierte sulfatierte Zirkonoxide (Reactions of short-chain alkanes, initiated through promoted sulfated zirconias), Vortragsveranstaltung der DGMK-Bezirksgruppen Mitteldeutschland und Berlin-Brandenburg zur Auswertung des 15. Welterdölkongresses in Peking, Berlin-Adlershof, Germany, Jan. 15, 1998.
29. Solid acid catalyzed alkane cracking mechanisms, 3. G.M. Schwab-Symposium, Catalysis for Organic Synthesis, Berlin, Germany, July 6–10, 1997.

## RESEARCH SUPPORT AND COLLABORATIONS

### 1. Current funding

“Acid Catalysis Design Guided by Spectroscopic Analysis of Reaction Networks”

\$550,000; DOE-BES DESC0021041; PI: F.C. Jentoft; Sept. 1, 2020–Aug. 31, 2023

“NSF-BSF: Steering Selectivity in Aldol Reactions by Control of Relative Effective Reaction Rates in Porous Catalysts”

\$330,000; NSF CBET #1804041; PI: F.C. Jentoft, foreign partner: O. Gazit (Technion – Israel Institute of Technology, Haifa, Israel, separately sponsored by BSF); Aug. 31, 2018–May 31, 2023

\$55,416 (supplement); NSF CBET# 2225910; PI: F.C. Jentoft; April 27, 2022–May 31, 2023

“NSF-BSF: Mechanism-Guided Design of Deoxydehydration Catalysts”

\$362,687; NSF CBET #2227945; PI: F.C. Jentoft, foreign partner: O.M. Gazit (Technion – Israel Institute of Technology, Haifa, Israel, funded by BSF); Sept. 1, 2022–Aug. 31, 2025

### 2. Summary of funding (current and previous)

<i>Sponsor</i>	<i>Program</i>	<i>Role</i>	<i>\$ Total</i>	<i>\$ FCJ</i>
Deutsche Forschungsgemeinschaft (DFG)	SPP- Priority Program, 2000 & 2002	Co-PI		296,300
	Standard grant 2004 + Invitation of researchers grant in 2005	PI		99,401
European Union FP6-NMP	Subwards of IDECAT Network of Excellence, 3 in 2005, 1 in 2008	PI		163,494
National Science Foundation	Major Research Instrumentation 2009 (w/o cost share)	PI	440,751	154,263
	Major Research Instrumentation 2017 (w/o cost share)	Co-PI	259,528	64,882
	EPSCoR Subaward 2010 & REU 2011, 2012	PI	40,000	35,000
	Unsolicited CHE 2012, CBET 2012, 2018, 2022	PI	1,514,975	1,312,758
Department of Energy	EPSCoR 2010 & 2013	Co-PI	5,640,389	849,359
	Subaward of EFRC CCEI (U Delaware) 2014	Co-PI	580,000	174,000
	DOE-Basic Energy Sciences, Catalysis Science	PI	550,000	550,000
American Chemical Society	Petroleum Research Fund New Directions, 2011 & 2018	PI	210,000	155,000
Industry	Company A 2012, 2013, 2014, 2015 & 2018, Company B 2018, Company C 2019	PI	665,000	607,500
Other	British Council Global Innovation Initiative Subaward 2015	PI	33,005	16,503
<b>Sum total</b>			<b>9,933,648</b>	<b>4,478,460</b>

### 3. Recent and current international research collaborations

Australia: Prof. Karen Wilson, RMIT University; Belgium: Prof. Michiel Dusselier, KU Leuven; Brazil: Prof. Claudio Mota, Federal University of Rio de Janeiro; China: Prof. Tao Zhang, Dalian Institute of Chemical Physics and Prof. Boqing Xu, Tsinghua University; England: Prof. Karen Wilson, Aston University, Birmingham; Germany: Prof. Klaus Köhler, Technische Universität München, Munich and Prof. Cornelia Bretkopf, Technische Universität Dresden; Israel: Prof. Oz Gazit, Technion, Haifa; Japan: Nippon Kayaku; Ukraine: Dr. Nataliya Shcherban, National Academy of Sciences of Ukraine, Kyiv.



## TEACHING

### 1. Courses taught at UMass

<i>Course</i>	<i>Semester</i>	<i>Enrollment</i>	<i># of Instructors</i>
ChE 325 <i>Thermodynamics II</i>	Spring 2022	41	1
	Spring 2020	67	1
ChE 401 <i>Chemical Engineering Laboratory I</i>	Fall 2020	59	4
	Fall 2019	89	5
	Fall 2018	97	5
	Fall 2017	90	4
	Fall 2016	92	4
	Fall 2015	102	3
ChE 402 <i>Chemical Engineering Laboratory II</i>	Spring 2018	69	4
	Spring 2017	88	5
	Spring 2016	94	5
ChE 690C <i>Catalysis: Fundamentals, Catalyst Synthesis and Characterization</i>	Fall 2022		1
	Spring 2021	7	1
	Spring 2019	10	1

### 2. Course contributions at UMass

ChE 555 *Concepts in Energy Conversion*, fall 2021 (contributed 4 lectures, course taught by W.C. Conner)  
 ChE 555 *Concepts in Energy Conversion*, fall 2019 (contributed 4 lectures, course taught by W.C. Conner)  
 ChE 555 *Concepts in Energy Conversion*, fall 2018 (contributed 5 lectures, course taught by W.C. Conner)  
 ChE 290A *Introduction to Energy Engineering*, fall 2016 (contributed 2 lectures, course taught by W.C. Conner)  
 ChE 291H *Honors Colloquium*, spring 2016 (contributed 1 lecture, course taught by J. Schiffman)  
 ChE 290A *Introduction to Energy Engineering*, fall 2015 (contributed 2 lectures, course taught by W.C. Conner)  
 ChE 491A *Professional Seminar for Seniors*, fall 2015 (contributed 1 lecture, course taught by J. Collura)

### 3. Courses taught at OU

ChE 5513 *Surface Characterization*, fall 2014 (6 enrolled)  
 ChE 4273 *Advanced Process Design*, spring 2014 (co-supervised 8 students with L.L. Lobban)  
 ChE 3432 *Unit Operations Laboratory*, spring 2014 (32 enrolled)  
 ChE 3473 *Chemical Engineering Thermodynamics*, fall 2013 (79 enrolled)  
 ChE 3432 *Unit Operations Laboratory*, spring 2013 (32 enrolled)  
 ChE 5513 *Surface Characterization*, fall 2012 (9 enrolled)  
 ChE 3432 *Unit Operations Laboratory*, spring 2012 (20 enrolled)  
 ChE 3473 *Chemical Engineering Thermodynamics*, fall 2011 (74 enrolled)  
 ChE 3473 *Chemical Engineering Thermodynamics*, fall 2010 (64 enrolled)  
 ChE 5480 *Surface Characterization*, developed new course, spring 2010 (10 enrolled)  
 ChE 3473 *Chemical Engineering Thermodynamics*, introduced new book and developed notes, fall 2009 (47 enrolled)  
 ChE 3432 *Unit Operations Laboratory*, spring 2009 (16 enrolled)

### 4. List of courses taught in Germany

31411 PR Experiment *Adsorption Calorimetry*, part of *Physical Chemistry IV/2 Laboratory* for advanced students of Chemistry, developed new experiment, HU Berlin, winter 2001/02, 02/03, 04/05, 05/06, 07/08  
 31307 UE *Physical Chemistry I/2, Chemical Thermodynamics of Mixed Phases*, conducted exercise class and designed tests, HU Berlin, summer 2002  
 31305 UE *Introduction to Physical Chemistry for students of Chemistry*, conducted exercise class and designed tests, HU Berlin, winter 2001/02  
 31455 *Thermal Analysis and Calorimetry* for advanced and graduate students of Chemistry, developed new course, HU Berlin, summer 2001  
 31312 PR *Physical Chemistry Laboratory* for students of Chemistry, winter 2000/01

31312 PR *Physical Chemistry Laboratory* for students of Biology and Biophysics, HU Berlin, summer 2000, 2001  
0582 09S *Surface Chemistry of Heterogeneous Catalysts* for advanced (7<sup>th</sup>/8<sup>th</sup> semester) students of Chemistry, TU München, winter 2000/01  
*Physical Chemistry Laboratory* for advanced students of Chemistry, LMU München, winter 1993/94

## 5. Lecture series and summer schools - organization and contributions

ACS Catalysis Division Educational Seminar Series *From Basics to Applications of Catalysis*, lead organizer, fall 2020 & summer 2021  
Lecture series *Modern methods in heterogeneous catalysis research*, curriculum, organization, and lecturer, FHI, HU Berlin, TU Berlin, winter 2002/03 – winter 2008/09, every winter semester  
Block course of the International Max Planck Research School *Complex surfaces in materials science*, lecturer, winter 2005/06, winter 2006/07 – summer 2008, every semester, FHI, HU & FU Berlin  
Central German Catalysis Teaching Association (Mitteldeutscher Katalyseverbund), lecturer, University of Leipzig, winter 2006/07, winter 2007/08  
Organization of a one week-long fall school *From single crystals to real catalysts*, Fritz Haber Institute, 1999

## 6. Efforts to improve teaching and mentoring

UMass “Mentor Training” (following the program developed by the National Research Mentoring Network), Aug. 25&26, 2021  
UMass ADVANCE Program Workshop “Mentoring Faculty Colleagues”, Dec. 8&9, 2020  
UMass Workshop “Promoting deep learning through group work”, Nov. 19, 2019  
UMass Police Department “Active threat training”, April 23, 2018  
UMass Workshop “Implicit bias and microaggressions in the college classroom”, Feb. 13, 2017  
Seminar “Active and cooperative learning” by Richard M. Felder and Rebecca Brent, Feb. 28, 2011  
Seminar on “Management of projects and research groups”, Jan. 31–Feb. 1, 2003, Seewiesen, Germany

## 7. Teaching awards

2<sup>nd</sup> Prize for Course Instructors, University of Oklahoma, College of Engineering Dean’s Office Centennial Competition, Spring 2010

## 8. Outreach and diversity activities

Transfer Student Experience Panel (Panelist), Oct. 2020  
UMass College of Engineering Graduate Diversity Recruitment Day, Jan. 2020, April 2019  
Faculty Recruitment Training for Diversity and Excellence: Strategies and Tactics to Improve Diversity and Excellence (STRIDE), Feb. 2019  
Women in Engineering Day for High School Girls: Gave lab tour and explained research, Oct. 2019, Oct. 2016.  
Oklahoma Women in Science Conference; Jentoft’s group operated booth with “hands-on science” and poster display for female middle and high school students, Feb. and Oct. 2011 and Oct. 2012  
EPSCoR Bioenergy Focus 2010, video explaining catalyst development for biomass conversion to fuels and chemicals, see <http://www.youtube.com/watch?v=HqJVx9o2mVE>  
Participated in video “Exploring Oklahoma’s Green Energy” 2009  
<http://www.youtube.com/watch?v=yY47YePo44M>  
Cooperation with the Gymnasium Athenaeum (high school) in Stade, Germany. Formulated proposal “*Nitrate concentration mapping in the Elbe estuary ecosystem*” and obtained funding within IDECAT (a European excellence network in catalysis), students conducted project under supervision of their teacher; results were presented by the high school students in the form of a poster at the open house day of the Fritz Haber Institute in June 2008, May–June 2008

## ADVISING AND MENTORING

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### 1. Postdoctoral researchers

*Department of Chemical Engineering, UMass Amherst*

Jincy Joseph, May 2015–April 2016

*School of Chemical, Biological and Materials Engineering, OU Norman*

Zhimin Liu, Jan. 2011–May 2015

*Fritz-Haber Institut der Max-Planck-Gesellschaft, Berlin, Germany*

Giulio Lolli, Kristina Chakarova, Tzvetomir Venkov, Katrin Pelzer, Samer Vijay, Annette Trunschke, Genka Tzolova Müller, Raimund Horn, Xiaobo Yang, Sabine Wrabetz, Patricia Concepción-Heydorn, Chunjuan Jia, Arnaud Sauvage

### 2. PhD and Master's theses supervised

*Department of Chemical Engineering, UMass Amherst (Committee Chair)*

Richard Morgan Whitfield, Doctoral thesis, Aug. 2021–present

Dipti Bhawe, Doctoral thesis, Aug. 2020–present

Isaac Ogabiela, Doctoral thesis, Aug. 2019–present

Juili D. Parab, Doctoral thesis, Aug. 2017–present

Aditya A. Rane, M.S. thesis, Aug. 2019–Aug. 2021, M.S. Aug. 2021

Eric D. Hernandez, Doctoral thesis, Aug. 2015–Aug. 2021, Ph.D. 2021

Bryan E. Sharkey, Doctoral thesis, Aug. 2014–Feb. 2020, Ph.D. 2020

Koushik Ponnuru, Doctoral thesis, Aug. 2014–May 2019, Ph.D. 2019

*School of Chemical, Biological and Materials Engineering at OU Norman (Committee Chair)*

Kelsey C. Potter, Aug. 2012–April 2015, M.S. 2015

Alana L. Denning, Aug. 2013–Dec. 2014 (accelerated BS/MS program), M.S. 2014

Ali Mehdad, Aug. 2011–Aug. 2015, PhD 2015

Chandramouli Vaddepalli, Jan. 2010–May 2012, M.S. 2012

Matthew J. Wulfers, Aug. 2008–March 2013, PhD 2013

ThuHuong Ngo, Aug. 2008–Sept. 2011, M.S. 2011

*Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, Germany (co-supervised)*

Nicole Giliard, Doctoral thesis, TU Berlin, 2011

Jens Hohmeyer, Doctoral thesis, TU Darmstadt, 2009

Carine Chan Thaw, Doctoral thesis, TU Berlin and ULP Strasbourg, 2008

Rhys Lloyd, Doctoral thesis, FU Berlin, 2008

Barbara S. Klose, Doctoral thesis, TU Berlin 2005

Pradnya Joshi, Master's thesis, FU Berlin 2005

Raimund Horn, Doctoral thesis, TU Berlin 2003

Rafad Ahmad, Doctoral thesis, FU Berlin 2003

Armin Fischer, Doctoral thesis, TU Berlin 2001

Barbara S. Klose, Diplomarbeit (~Master's thesis), TU München 2001

Jutta Kröhnert, Diplomarbeit (~Master's thesis), TFH Berlin 1999

### 3. Awards and recognition for students

Juili D. Parab, Richard J. Kokes Travel Award of the North American Catalysis Society, 2022

Aditya A. Rane, Tillwick and Eldridge Award for teaching assistants, fall 2020

Juili D. Parab, Tillwick and Eldridge Award for teaching assistants, fall 2020

Juili D. Parab, Tillwick and Eldridge Award for teaching assistants, spring 2020

Eric D. Hernandez, AIChE Catalysis and Reaction Engineering Division Student Travel Grant Award, 2019

Eric D. Hernandez, Richard J. Kokes Travel Award of the North American Catalysis Society, 2019

Bryan E. Sharkey, ACS CATL Division, Graduate Student Travel Award, 2019 ACS Spring Meeting

Eric Hernandez, Graduate Student Travel Award (poster competition, intramural funds), 2019

Koushik Ponnuru, AIChE Catalysis and Reaction Engineering Division Student Travel Grant Award, 2018  
 Koushik Ponnuru, Richard J. Kokes Travel Award of the North American Catalysis Society, 2017  
 Koushik Ponnuru and Eric Hernandez, Graduate Student Travel Award (poster competition, intramural funds), 2016  
 Alana L. Denning, Student Poster Award, Southwest Catalysis Society, 2014 Spring Symposium, Rice University, Houston, 2014 (5 awards given among 32 posters)  
 Matthew J. Wulfers, GSAS Scholarship to participate in the Session on Catalysis and Materials for Hydrocarbon Conversions in Doha, Qatar, 2013  
 Matthew J. Wulfers, Research Grant from Graduate Student Senate at the University of Oklahoma, Spring 2012  
 Alana L. Denning, Distinction in Undergraduate Research Award, OU Undergraduate Research Day 2012  
 Matthew J. Wulfers, NSF PIRE scholarship to participate in Summer School “Energy and Materials from the Sun”, Kerkrade, The Netherlands, 2011  
 Chandramouli Vaddepalli, Richard J. Kokes Travel Award of the North American Catalysis Society, 2011  
 Matthew J. Wulfers, OU College of Engineering Centennial Fellowship, 2011–2013  
 Matthew J. Wulfers, Travel Grant from Graduate Student Senate at the University of Oklahoma, Fall 2010  
 Matthew J. Wulfers, 1<sup>st</sup> Prize Graduate Student Poster Award, 55<sup>th</sup> Pentasectional Meeting of the American Chemical Society, Norman, OK, USA, 2010  
 Barbara S. Klose, 3<sup>rd</sup> Prize in the 2006 Shell-She-Study Award competition

#### 4. Undergraduate research

##### *Honors Theses, UMass Amherst*

Alexander Marshall, ChE 499Y/T, fall 2021/spring 2022 (chair)  
 Gillian R. Binley, ChE 499Y/T, fall 2019/spring 2020 (chair)  
 Armino Carvalho, ChE 499Y/T, fall 2018/spring 2019 (chair)  
 Abdul Mughis Paracha, 2018/19 (committee member, chair: Wei Fan)

##### *Independent Study, UMass Amherst*

Alexander Marshall, ChE 396ISH, spring 2021  
 Gillian R. Binley, ChE 396, spring 2019  
 Armino Carvalho, ChE 396ISH, spring 2018  
 Shuaib Balogun ChE 396, fall 2016  
 John E. Lyons, ChE 496, fall 2015

##### *Honors Research and other research experiences, OU Norman*

Lydia George, ChE 4980 Honors Research, Fall 2014  
 Travis Herrian, research assistant (hourly), Summer 2014  
 Connor W. Beckerle, ChE 3980 Honors Research Spring 2014 and research assistant (hourly), Summer and Fall 2014  
 Austin Donnell, research assistant (hourly), Summer 2013 and Spring 2014  
 Kevin E. Buettner (B.S. Sp. 2013), research assistant (hourly), Summer 2013  
 Mackenzie J. Carder, research assistant (hourly) Spring 2013, ChE 4980 Senior Research Fall 2013  
 John T. Grinde, Program of Excellence Scholarship Spring 2013 & Fall 2014, ChE 3980 Honors Research Fall 2013  
 Bryce A. Hansard, Program of Excellence Scholarship Spring 2013 and Fall 2013  
 Lauren C. Gilbert, ChE 3980 Honors Research Fall 2012, Program of Excellence Scholarship Spring 2013, Summer 2013 and Fall 2013  
 Grant E. Loveall, ChE 4980 Senior Research Fall 2012  
 Matthew G. Wallace, Summer REU 2012, ChE 4980 Senior Research Fall 2012  
 Nicholas R. Luedtke, ChE 3990 Undergraduate Research Experience Summer/Fall 2011  
 Alana L. Denning, Summer REU 2011, ChE 3990 Undergraduate Research Experience Fall 2011 and Spring 2012  
 Blake A. Myrick, ChE 3980 Honors Research Spring 2011  
 Katlin D. Robinson, ChE 3980 Honors Research Fall 2010  
 Participated regularly in CBME advising sessions Fall 2009–2014

## ACADEMIC SERVICE & PROFESSIONAL ACTIVITIES

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### 1. Offices and committees at OU/UMass

#### *University*

Institutional Chemical Safety Committee, March 2016–present (Chair: D. Hoagland, committee appointed by Vice Chancellor Michael Malone)

EH&S External Review Committee, Dec. 2019–March 2020 (committee appointed by Vice Chancellor Andrew Mangels)

Provost's Advisory Committee for Classrooms, Aug. 2013–Dec. 2014 (Chair: M. Morvant)

Faculty Appeals Board, Aug. 2013–Dec. 2014

#### *College*

Elected member, College Personnel Committee, AY 2022/2023

College of Engineering Junior & Senior Awards Committee, Member AY 2021/2022

Elected member, College Personnel Committee, AY 2021/2022 (spring only)

Materials Science & Engineering Program Task Force, 2019–present (Chair: A. Ramasubramaniam)

Elected member, College Personnel Committee, AY 2019/2020

College of Engineering Junior & Senior Awards Committee, Member AY 2014/2015

Dean Evaluation Committee, 2013 (Chair: J. Sluss)

Director for OU's Advanced Radar Research Center (ARRC) Search Committee, 2014 (Chairs: B. Moore III and T.L. Landers)

#### *Department*

Student Professional Development Committee, AY 2021/2022

External Awards Committee, AY 2020/2021

Diversity Committee, AY 2019/2020 (Chair: J. Schiffman)

Graduate Admission Committee, since AY 2015/2016

Faculty Search Committee, AY 2017/2018 (Chair: W. Fan)

Faculty Search Committee, Department of Chemistry, AY 2017/2018 (Chair: V. Rotello)

Elected member and Chair, Department Personnel Committee, AY 2017/2018

Department Leadership Committee, Summer 2016 (Chair: John Klier)

Elected member and Chair, Department Personnel Committee, AY 2016/2017

Open Rank Faculty Search Committee, Chair, March 2016–May 2017

Undergraduate Program Committee, 2015–2017 (Chairs: P.A. Monson, W. Fan)

Department Head Search Committee, 2014–2015 (Chair: T.J. Anderson)

Elected member, Department Personnel Committee, AY 2015/2016 (Chair: J.M. Davis)

CBME Faculty Search Committee, 2013 (Chair: L.L. Lobban)

Coordinator of the seminar series of the School of Chemical, Biological and Materials Engineering, Aug. 2011–Dec. 2014

Member of committee for selection of Organic Chemistry sequence for Chemical Engineering curriculum (with R.G. Harrison), 2011

Member of committee for integration of Physical Chemistry classes into Chemical Engineering curriculum (with D.E. Resasco), 2011

ABET Student outcomes committee: Outcomes (e) an ability to identify, formulate, and solve engineering problems (Lead) and (g) an ability to communicate effectively, 2009–2014

ABET Course outcomes committee: CHE 3473 Chemical Engineering Thermodynamics (Lead), CHE 3333 Separations, CHE 3432 Unit Operations Laboratory, 2009–2014

#### *Extramural*

Vice Chair, Scientific Advisory Board, Center for Environmentally Beneficial Catalysis, University of Kansas (2022–present)

Selection committee for endowed professorship, School of Chemical, Biological & Materials Engineering, University of Oklahoma, Norman, 2022

Executive Committee, NSF EPSCoR Research Infrastructure Improvement Plan “Building Oklahoma’s Leadership Role in Cellulosic Bioenergy”, Member, Dec. 2009–2014



## 2. Offices and committees at Fritz Haber Institute

Strategic Committee of the Max Planck Society, tasks: devise strategy for restructuring of a Max Planck Institute in the field of Chemistry, define research field, and identify candidates for future directors, 2007–08  
Search committee of the Max Planck Society, task: select new *Independent junior research group leaders* in the *Chemistry, physics and technology* section of the Max Planck Society, 2007 & 2008  
Elected *Representative of the Scientific Employees* of the Fritz Haber Institute at meetings of the *Chemistry, Physics and Technology Section* of the *Scientific Council* of the Max Planck Society, July 2006–Sept. 2008  
Elected *Ombudsperson* at the Fritz Haber Institute, mediator in cases of scientific misconduct, July 2006–Sept. 2008  
Department of Inorganic Chemistry *Liaison Officer* and Lecturer, International Max Planck Research School *Complex Surfaces in Materials Science* at Fritz Haber Institute, Humboldt-Universität zu Berlin and Freie Universität Berlin, 2002–2008

## 3. Scientific publishing

Editor of *Advances in Catalysis* 2014–2015, Editor together with Bruce C. Gates 2012–2013, Associate Editor together with Bruce C. Gates and Helmut Knözinger 2008–2011. *Advances in Catalysis* is a book series with reviews in the field of catalysis, published by Academic Press Inc. Elsevier Science. 2014 Impact Factor: 10.00.  
Guest Editor (together with Gerhard Mestl), *Topics in Catalysis*, 2017 (see Publications, edited journal issues).  
Guest Editor (together with Helmut Knözinger), *Topics in Catalysis*, 2011 (see Publications, edited journal issues).  
Member of the International Advisory Board of *ChemCatChem*, 2013–2016.  
Member of the Editorial Board of *Applied Catalysis A: General*, 2007–2010.

## 4. Reviewer functions (2009-present)

*International Journals*: Accounts of Chemical Research, ACS Catalysis, Advanced Materials, Angewandte Chemie, Applied Catalysis A: General, Applied Catalysis B: Environmental, Catalysis Communications, Catalysis Letters, Catalysis Science & Technology, Catalysis Today, Catalysts, ChemCatChem, ChemElectroChem, Chemical Communications, Chemical Engineering Journal, Chemical Engineering Science, Chemistry A European Journal, Chemistry of Materials, ChemNanoMat, ChemSusChem, Industrial & Engineering Chemistry Research, International Journal of Chemical Kinetics, Journal of the American Chemical Society, Journal of Catalysis, Journal of Hazardous Materials, Journal of Molecular Catalysis, Journal of Physical Chemistry, Journal of Physical Chemistry Letters, Materials Chemistry and Physics, Microporous and Mesoporous Materials, Molecular Catalysis, Molecular Physics, Nature Communications, Physical Chemistry Letters, Surface Science, Thermochimica Acta, Topics in Catalysis.

*Funding Agencies USA*: National Science Foundation CBET and CHE Divisions unsolicited, CAREER, SBIR, STC/CCI center and DMREF proposals (panel member 2008, 2010–2014, 2016–2022, and ad hoc reviewer 2010–2013, 2015, 2017); Department of Energy Basic Energy Sciences, open and special FOAs, SBIR/STTR, EFRC, and CAREER proposals, National Laboratory review (2012, 2019–2022); American Chemical Society Petroleum Research Fund.

*Funding Agencies international*: Deutsche Forschungsgemeinschaft (Germany), Agence Nationale de la Recherche (France), Swiss National Science Foundation (Switzerland), The Netherlands Organisation for Scientific Research (The Netherlands), Czech Science Foundation (Czech Republic), Marsden Fund - The Royal Society (New Zealand).

*Conferences*: CATBIOR – International Congress on Catalysis for Biorefineries 2017, 2019, International Congress on Catalysis 2016, International Zeolite Conference 2016, North American Catalysis Society Meeting 2011, 2013, 2015, 2017, 2019, 2022; International Symposium on Acid–Base Catalysis 2013, 2017.

## 5. Funding agency consulting

Member, NSF CBET Division Director Search, Canvassing Committee, 2021.  
Participated in DOE–NIST Materials Genome Initiative Grand Challenges Workshop, sector Catalysts (upon invitation), Rockville, MD, June 25–26, 2013.  
Participated in workshop that defines priorities and directions for the NSF Chemical Catalysis Program (upon invitation), Denver, CO, Aug. 26–27, 2011.



## 6. Conference organization

Co-Chair, Technical Program Committee, North American Catalysis Society Meeting, Providence, RI, USA, 2023.  
Member, Technical Program Committee, North American Catalysis Society Meeting, New York, NY, USA, May 22–27, 2022.  
Co-organized and chaired symposium “Fundamental Insights in Catalytic Chemistry through Precisely Synthesized Materials: A Symposium Honoring Bruce C. Gates” ACS Spring Meeting, San Diego, CA, USA, March 20–24, 2022.  
Scientific Committee of the 5<sup>th</sup> International Congress on Catalysis for Biorefineries, Turku, Finland, Sept. 23–27, 2019.  
Co-organized ACS Symposium “Frontiers in Catalysis for Energy and Sustainability” on behalf of ACS Catalysis Division (CATL), 257<sup>th</sup> ACS National Meeting and Exposition, Orlando, FL, USA, March 31–April 4, 2019.  
Invited member of the International Committee for the 4<sup>th</sup> International Congress on Catalysis for Biorefineries (CATBIOR), Lyon, France, Dec. 11–15, 2017.  
Invited member of the Scientific Committee of the 18<sup>th</sup> International Zeolite Conference, Rio de Janeiro, June 19–24, 2016.  
Organized and chaired session on "Catalytic biomass conversion to chemicals" (together with B.H. Shanks and J.-P. Tessonnier, both Iowa State University, Ames, IA), 2013 AIChE Annual Meeting, San Francisco, CA, USA, Nov. 3–Nov. 8, 2013.  
Organized and chaired session on "Catalytic biomass conversion to chemicals" (together with B.H. Shanks, Iowa State University, Ames, IA), 2012 AIChE Annual Meeting, Pittsburgh, PA, USA, Oct. 28–Nov. 2, 2012.  
Invited member of Scientific Advisory Panel for the 4<sup>th</sup> International Congress on Operando Spectroscopy - Recent Developments and Future Perspectives in Spectroscopy of Working Catalysts, Brookhaven National Laboratory, Upton, NY, USA, April 29–May 3, 2012.  
Organized and chaired session on "Catalytic biomass conversion to chemicals" (together with B.H. Shanks, Iowa State University, Ames, IA), 2011 AIChE Annual Meeting, Minneapolis, MN, USA, Oct. 16–21, 2011.  
Organized and chaired session on “Analytical and General Chemistry” (together with Stuart N. Milligan, ConocoPhillips, Bartlesville, OK), 56<sup>th</sup> Pentasectional Meeting of the American Chemical Society, Bartlesville, OK, USA, March 12, 2011.  
Organized and chaired session on “Catalytic biomass conversion to chemicals” (with R.G. Mallinson, OU), 2010 AIChE Annual Meeting, Salt Lake City, UT, USA, Nov. 7–12, 2010.  
Organized and chaired session on “Catalytic conversion of oxygenates” (with R.G. Mallinson, OU), 2009 AIChE Annual Meeting, Nashville, TN, USA, Nov. 8–13, 2009.  
Advised on conference organization and organized and chaired session entitled “Modified oxides” (with R.M. Martín-Aranda, UNED, Madrid, Spain), 6<sup>th</sup> World Congress on Catalysis by Acids and Bases, Genova, Italy, May 10–14, 2009.

## 7. Functions in societies and organizations

Elected Member at Large, ACS Catalysis Division Executive Committee, 2019-2021 (3 years) and Chair of ACS CATL Division Educational Committee (2020); launched inaugural ACS CATL Division Educational Seminar Series in fall 2020.  
Member, ACS Catalysis Division Adhoc Award Committee, 2018–present.  
Elected president (Oct. 2009–June 2013) and member of the *Acid-Base-Catalysis Board of Directors*, 2005–June 2013); functions of the board: organization of the “International Symposium on Acid-Base Catalysis (ca. 200 participants in 2009, ca. 250 participants in 2013), administration of the *Tanabe Prize* and a Young Scientist Award (established during this presidency).