

## YUSHAN YAN

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Yushan Yan is the Distinguished Engineering Professor in the Department of Chemical and Biomolecular Engineering and the Associate Dean for Research and Entrepreneurship for the College of Engineering at the University of Delaware.

He received his B.S. in Chemical Physics from the University of Science and Technology of China in 1988, and Ph.D. in Chemical Engineering from the California Institute of Technology in 1997. He studied heterogeneous catalysis at the Dalian Institute of Chemical Physics of the Chinese Academy of Sciences from 1988 to 1992. He worked for AlliedSignal Inc. as Senior Staff Engineer and Project Leader for two years (1996-1998) before beginning his academic career at the University of California Riverside (UCR) (Assistant Professor, 1998, Associate Professor, 2002, and Professor, 2005).

He was honored as one of the 5 inaugural University Scholars at UCR in 2006 and was given the title of University of California Presidential Chair in 2010. He is a Fellow of the American Association for the Advancement of Science. He was recognized by the International Zeolite Association with the Donald Breck Award for his zeolite thin film research. He was one of 37 awardees in the US Department of Energy's ARPA-E OPEN 2009 (the inaugural open call for proposals) for his fuel cell technology and one of 66 awardees in OPEN 2012 (the 2<sup>nd</sup> open call for proposals) for his redox flow battery concept.

His current group includes 2 professional research staff, 3 postdocs, 16 graduate students, and 5 undergraduate students. He has supervised in the past 41 postdocs and PhD students, 13 MS students, 25 undergraduate students, 7 high school students, and 8 visiting faculty. Fourteen of his formal postdoc and PhD students hold faculty position in China, Australia, Canada, and US.

He served as AIChE Chapter Advisor (hosted Western Regional Student Conference), ABET Lead (passed the first ABET 2000 accreditation for both chemical and environmental engineering programs), Search Committee Chair, and Department Chair at UCR. He has also organized/chaired many sessions/symposiums in various national and international meetings, including serving as Chair for the 2013 Gordon Conference on Nanoporous Materials.

He has been an inventor on 25+ issued or pending patents, many of which were licensed to form startup companies including Pacific Fuel Cell Corp, NanoH<sub>2</sub>O, Full Cycle Energy, Zeolite Solution Materials, OH-Energy, DEGi Chlorine, and DEGi Storage. He has served on the advisory board of all these companies. He is also the co-founder of Full Cycle Energy, Zeolite Solution Materials, OH-Energy, DEGi Chlorine, and DEGi Storage. His nanocomposite desalination membrane technology was commercialized by NanoH<sub>2</sub>O.

He has delivered 160+ invited lectures including Plenary Lectures and Named Lectures. His 170+ published articles on **electrocatalysis, and electrochemical devices, and zeolite/polymer films and membranes** have been widely cited in the scientific community (h-index = 53, total citation = 9000+, 9 papers > 200 citations, 25 papers > 100 citations, 10 papers ranked Highly Cited by the Essential Citation Index) and extensively covered by the media, e.g., New Scientist, C&EN News, Materials Today, Materials 360, Chemical Engineering Progress, Business Week, China Press, Chinese Daily News, The News Journal, CNN.com, CNBC, KABC, and VOA.

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### JOURNAL ARTICLES <sup>1-173</sup>

- (1) Sheng W., Zhuang Z., Gao M., Zheng J., Chen J.G., Yan Y., Correlating hydrogen oxidation and evolution activity on platinum at different pH with measured hydrogen binding energy. *Nature Communications* 2015, **6**: 5848-5848.
- (2) Zhuang Z., Sheng W., Yan Y., Synthesis of Monodisperse Au@Co<sub>3</sub>O<sub>4</sub> Core-Shell Nanocrystals and Their Enhanced Catalytic Activity for Oxygen Evolution Reaction. *Advanced Materials* 2014, **26**(23): 3950-3955.
- (3) Zhang C., Yang H., Sun T., Shan N., Chen J., Xu L., Yan Y., Synthesis of three-dimensionally ordered macro-/mesoporous Pt with high electrocatalytic activity by a dual-templating approach. *Journal of Power Sources* 2014, **245**: 579-582.
- (4) Zhang C., Xu L., Shan N., Sun T., Chen J., Yan Y., Enhanced Electrocatalytic Activity and Durability of Pt Particles Supported on Ordered Mesoporous Carbon Spheres. *Acs Catalysis* 2014, **4**(6): 1926-1930.
- (5) Zhan Z., Shao J., Peng Y., Wang Z., Yan Y., High performance zeolite NaA membranes synthesized on the inner surface of zeolite/PES-PI blend composite hollow fibers. *Journal of Membrane Science* 2014, **471**: 299-307.
- (6) Wittkopf J.A., Zheng J., Yan Y., High-Performance Dealloyed PtCu/CuNW Oxygen Reduction Reaction Catalyst for Proton Exchange Membrane Fuel Cells. *Acs Catalysis* 2014, **4**(9): 3145-3151.
- (7) Sheng W., Bivens A.P., Myint M., Zhuang Z., Forest R.V., Fang Q., Chen J.G., Yan Y., Non-precious metal electrocatalysts with high activity for hydrogen oxidation reaction in alkaline electrolytes. *Energy & Environmental Science* 2014, **7**(5): 1719-1724.
- (8) Shao J., Zhan Z., Li J., Wang Z., Li K., Yan Y., Zeolite NaA membranes supported on alumina hollow fibers: Effect of support resistances on pervaporation performance. *Journal of Membrane Science* 2014, **451**: 10-17.
- (9) Peng Y., Lu H., Wang Z., Yan Y., Microstructural optimization of MFI-type zeolite membranes for ethanol-water separation. *Journal of Materials Chemistry A* 2014, **2**(38): 16093-16100.
- (10) Myint M., Yan Y., Chen J.G., Reaction Pathways of Propanal and 1-Propanol on Fe/Ni(111) and Cu/Ni(111) Bimetallic Surfaces. *Journal of Physical Chemistry C* 2014, **118**(21): 11340-11349.
- (11) Mahoney E.G., Sheng W., Yan Y., Chen J.G., Platinum-Modified Gold Electrocatalysts for the Hydrogen Oxidation Reaction in Alkaline Electrolytes. *Chemelectrochem* 2014, **1**(12): 2058-2063.
- (12) Ma J., Shao J., Wang Z., Yan Y., Preparation of Zeolite NaA Membranes on Macroporous Alumina Supports by Secondary Growth of Gel Layers. *Industrial & Engineering Chemistry Research* 2014, **53**(14): 6121-6130.

- (13) Liu Y., Wang J., Yang Y., Brenner T.M., Seifert S., Yan Y., Liberatore M.W., Herring A.M., Anion Transport in a Chemically Stable, Sterically Bulky  $\alpha$ -C Modified Imidazolium Functionalized Anion Exchange Membrane. *Journal of Physical Chemistry C* 2014, **118**(28): 15136-15145.
- (14) Gu S., Xu B., Yan Y., Electrochemical Energy Engineering: A New Frontier of Chemical Engineering Innovation. *Annual Review of Chemical and Biomolecular Engineering, Vol 5* 2014, **5**: 429-454.
- (15) Gu S., Gong K., Yan E.Z., Yan Y., A multiple ion-exchange membrane design for redox flow batteries. *Energy & Environmental Science* 2014, **7**(9): 2986-2998.
- (16) Gao M., Sheng W., Zhuang Z., Fang Q., Gu S., Jiang J., Yan Y., Efficient Water Oxidation Using Nanostructured  $\alpha$ -Nickel-Hydroxide as an Electrocatalyst. *Journal of the American Chemical Society* 2014, **136**(19): 7077-7084.
- (17) Fang Q., Zhuang Z., Gu S., Kaspar R.B., Zheng J., Wang J., Qiu S., Yan Y., Designed synthesis of large-pore crystalline polyimide covalent organic frameworks. *Nature Communications* 2014, **5**.
- (18) Fang Q., Gu S., Zheng J., Zhuang Z., Qiu S., Yan Y., 3D Microporous Base-Functionalized Covalent Organic Frameworks for Size-Selective Catalysis. *Angewandte Chemie-International Edition* 2014, **53**(11): 2878-2882.
- (19) Alia S.M., Yan Y.S., Pivovar B.S., Galvanic displacement as a route to highly active and durable extended surface electrocatalysts. *Catalysis Science & Technology* 2014, **4**(10): 3589-3600.
- (20) Alia S.M., Duong K., Liu T., Jensen K., Yan Y., Palladium and Gold Nanotubes as Oxygen Reduction Reaction and Alcohol Oxidation Reaction Catalysts in Base. *ChemSuschem* 2014, **7**(6): 1739-1744.
- (21) Wang J., Gu S., Kaspar R.B., Zhang B., Yan Y., Stabilizing the Imidazolium Cation in Hydroxide-Exchange Membranes for Fuel Cells. *ChemSuschem* 2013, **6**(11): 2079-2082.
- (22) Tessonnier J.-P., Goubert-Renaudin S., Alia S., Yan Y., Barteau M.A., Structure, Stability, and Electronic Interactions of Polyoxometalates on Functionalized Graphene Sheets. *Langmuir* 2013, **29**(1): 393-402.
- (23) Sheng W., Myint M., Chen J.G., Yan Y., Correlating the hydrogen evolution reaction activity in alkaline electrolytes with the hydrogen binding energy on monometallic surfaces. *Energy & Environmental Science* 2013, **6**(5): 1509-1512.
- (24) Peng Y., Zhan Z., Shan L., Li X., Wang Z., Yan Y., Preparation of zeolite MFI membranes on defective macroporous alumina supports by a novel wetting-rubbing seeding method: Role of wetting agent. *Journal of Membrane Science* 2013, **444**: 60-69.
- (25) Gu S., Sheng W., Cai R., Alia S.M., Song S., Jensen K.O., Yan Y., An efficient Ag-ionomer interface for hydroxide exchange membrane fuel cells. *Chemical Communications* 2013, **49**(2): 131-133.
- (26) Alia S.M., Pivovar B.S., Yan Y., Platinum-Coated Copper Nanowires with High Activity for Hydrogen Oxidation Reaction in Base. *Journal of the American Chemical Society* 2013, **135**(36): 13473-13478.
- (27) Alia S.M., Jensen K., Contreras C., Garzon F., Pivovar B., Yan Y., Platinum Coated Copper Nanowires and Platinum Nanotubes as Oxygen Reduction Electrocatalysts. *Acs Catalysis* 2013, **3**(3): 358-362.
- (28) Zhu J., Thinh V., Li D., Lu R., Kinsinger N.M., Xiong L., Yan Y., Kisailus D., Crystal Growth of Li Ni<sub>1/3</sub>Co<sub>1/3</sub>Mn<sub>1/3</sub>O<sub>2</sub> as a Cathode Material for High-Performance Lithium Ion Batteries. *Crystal Growth & Design* 2012, **12**(3): 1118-1123.
- (29) Zhou C., Liu Z., Du X., Mitchell D.R.G., Mai Y.-W., Yan Y., Ringer S., Hollow nitrogen-containing core/shell fibrous carbon nanomaterials as support to platinum nanocatalysts and their TEM tomography

- study. *Nanoscale Research Letters* 2012, **7**: 1-11.
- (30) Zhao J., Luo T., Zhang X., Lei Y., Gong K., Yan Y., Highly Selective Zeolite Membranes as Explosive Preconcentrators. *Analytical Chemistry* 2012, **84**(15): 6303-6307.
- (31) Zhang B., Gu S., Wang J., Liu Y., Herring A.M., Yan Y., Tertiary sulfonium as a cationic functional group for hydroxide exchange membranes. *Rsc Advances* 2012, **2**(33): 12683-12685.
- (32) Sun M., Hunt H.K., Lew C.M., Cai R., Liu Y., Yan Y., A Dynamic Organic Structuring-Directing Agent for Pure-Silica-Zeolite AST and LTA Syntheses. *Chinese Journal of Catalysis* 2012, **33**(1): 85-91.
- (33) Li J., Shao J., Ge Q., Wang G., Wang Z., Yan Y., Influences of the zeolite loading and particle size in composite hollow fiber supports on properties of zeolite NaA membranes. *Microporous and Mesoporous Materials* 2012, **160**: 10-17.
- (34) Lai L., Shao J., Ge Q., Wang Z., Yan Y., The preparation of zeolite NaA membranes on the inner surface of hollow fiber supports. *Journal of Membrane Science* 2012, **409**: 318-328.
- (35) Krishnani K.K., Zhang Y., Xiong L., Yan Y., Boopathy R., Mulchandani A., Bactericidal and ammonia removal activity of silver ion-exchanged zeolite. *Bioresource Technology* 2012, **117**: 86-91.
- (36) Gu S., Skovgard J., Yan Y.S., Engineering the Van der Waals Interaction in Cross-Linking-Free Hydroxide Exchange Membranes for Low Swelling and High Conductivity. *Chemsuschem* 2012, **5**(5): 843-848.
- (37) Ge Q., Shao J., Wang Z., Yan Y., Effects of the synthesis hydrogel on the formation of zeolite LTA membranes. *Microporous and Mesoporous Materials* 2012, **151**: 303-310.
- (38) Fang J., Huang Y., Lew C.M., Yan Y., Pilon L., Temperature dependent thermal conductivity of pure silica MEL and MFI zeolite thin films. *Journal of Applied Physics* 2012, **111**(5).
- (39) Dong Y., Peng Y., Wang G., Wang Z., Yan Y., Corrosion-Resistant Zeolite Silicalite-1 Coatings Synthesized by Seeded Growth. *Industrial & Engineering Chemistry Research* 2012, **51**(9): 3646-3652.
- (40) Chow G., Bedi R.S., Yan Y., Wang J., Zeolite as a wear-resistant coating. *Microporous and Mesoporous Materials* 2012, **151**: 346-351.
- (41) Bedi R.S., Cai R., O'Neill C., Beving D.E., Foster S., Guthrie S., Chen W., Yan Y., Hydrophilic and antimicrobial Ag-exchanged zeolite a coatings: A year-long durability study and preliminary evidence for their general microbiocidal efficacy to bacteria, fungus and yeast. *Microporous and Mesoporous Materials* 2012, **151**: 352-357.
- (42) Alia S.M., Jensen K.O., Pivovar B.S., Yan Y., Platinum-Coated Palladium Nanotubes as Oxygen Reduction Reaction Electrocatalysts. *Acs Catalysis* 2012, **2**(5): 858-863.
- (43) Alia S.M., Duong K., Liu T., Jensen K., Yan Y., Supportless Silver Nanowires as Oxygen Reduction Reaction Catalysts for Hydroxide-Exchange Membrane Fuel Cells. *Chemsuschem* 2012, **5**(8): 1619-1624.
- (44) Zhou C., Liu Z., Yan Y., Du X., Mai Y.-W., Ringer S., Electro-synthesis of novel nanostructured PEDOT films and their application as catalyst support. *Nanoscale Research Letters* 2011, **6**.
- (45) Wang Z., Ge Q., Gao J., Shao J., Liu C., Yan Y., High-Performance Zeolite Membranes on Inexpensive Large-Pore Supports: Highly Reproducible Synthesis using a Seed Paste. *Chemsuschem* 2011, **4**(11): 1570-1573.
- (46) Shao J., Ge Q., Shan L., Wang Z., Yan Y., Influences of Seeds on the Properties of Zeolite NaA Membranes on Alumina Hollow Fibers. *Industrial & Engineering Chemistry Research* 2011, **50**(16): 9718-

9726.

- (47) Shan L., Shao J., Wang Z., Yan Y., Preparation of zeolite MFI membranes on alumina hollow fibers with high flux for pervaporation. *Journal of Membrane Science* 2011, **378**(1-2): 319-329.
- (48) Li X., Wang Z., Zheng J., Shao S., Wang Y., Yan Y., Dynamic Hydrothermal Synthesis of a b-Oriented MFI Zeolite Film. *Chinese Journal of Catalysis* 2011, **32**(2): 217-223.
- (49) Li X., Peng Y., Wang Z., Yan Y., Synthesis of highly b-oriented zeolite MFI films by suppressing twin crystal growth during the secondary growth. *Crystengcomm* 2011, **13**(11): 3657-3660.
- (50) Lew C.M., Liu Y., Kisailus D., Kloster G.M., Chow G., Boyanov B., Sun M., Wang J., Yan Y., Insight into On-Wafer Crystallization of Pure-Silica-Zeolite Films through Nutrient Replenishment. *Langmuir* 2011, **27**(7): 3283-3285.
- (51) Kinsinger N., Tantuccio A., Sun M., Yan Y., Kisailus D., Photocatalytic Titanium Dioxide Composite. *Journal of Nanoscience and Nanotechnology* 2011, **11**(8): 7015-7021.
- (52) He X., Huang X., Wang Z., Yan Y., The role of silver species on the hydrothermal stability of zeolite catalysts. *Microporous and Mesoporous Materials* 2011, **142**(1): 398-403.
- (53) Gu S., Cai R., Yan Y., Self-crosslinking for dimensionally stable and solvent-resistant quaternary phosphonium based hydroxide exchange membranes. *Chemical Communications* 2011, **47**(10): 2856-2858.
- (54) Li X., Yan Y., Wang Z., Continuity Control of b-Oriented MFI Zeolite Films by Microwave Synthesis. *Industrial & Engineering Chemistry Research* 2010, **49**(12): 5933-5938.
- (55) Li W., Xin Q., Yan Y., Nanostructured Pt-Fe/C cathode catalysts for direct methanol fuel cell: The effect of catalyst composition. *International Journal of Hydrogen Energy* 2010, **35**(6): 2530-2538.
- (56) Li W., Waje M., Chen Z., Larsen P., Yan Y., Platinum nanoparticles supported on stacked-cup carbon nanofibers as electrocatalysts for proton exchange membrane fuel cell. *Carbon* 2010, **48**(4): 995-1003.
- (57) Li W., Chen Z., Xu L., Yan Y., A solution-phase synthesis method to highly active Pt-Co/C electrocatalysts for proton exchange membrane fuel cell. *Journal of Power Sources* 2010, **195**(9): 2534-2540.
- (58) Lew C.M., Cai R., Yan Y., Zeolite Thin Films: From Computer Chips to Space Stations. *Accounts of Chemical Research* 2010, **43**(2): 210-219.
- (59) Hunt H.K., Lew C.M., Sun M., Yan Y., Davis M.E., Pure-silica zeolite thin films by vapor phase transport of fluoride for low-k applications. *Microporous and Mesoporous Materials* 2010, **128**(1-3): 12-18.
- (60) Hunt H.K., Lew C.M., Sun M., Yan Y., Davis M.E., Pure-silica LTA, CHA, STT, ITW, and -SVR thin films and powders for low-k applications. *Microporous and Mesoporous Materials* 2010, **130**(1-3): 49-55.
- (61) Gu S., Cai R., Luo T., Jensen K., Contreras C., Yan Y., Quaternary Phosphonium-Based Polymers as Hydroxide Exchange Membranes. *ChemSuschem* 2010, **3**(5): 555-558.
- (62) Coquil T., Lew C.M., Yan Y., Pilon L., Thermal conductivity of pure silica MEL and MFI zeolite thin films. *Journal of Applied Physics* 2010, **108**(4).
- (63) Chen J., Hua Z., Yan Y., Zakhidov A.A., Baughman R.H., Xu L., Template synthesis of ordered arrays of mesoporous titania spheres. *Chemical Communications* 2010, **46**(11): 1872-1874.
- (64) Chen G., Bedi R.S., Yan Y.S., Walker S.L., Initial Colloid Deposition on Bare and Zeolite-Coated

- Stainless Steel and Aluminum: Influence of Surface Roughness. *Langmuir* 2010, **26**(15): 12605-12613.
- (65) Cai R., Liu Y., Gu S., Yan Y., Ambient Pressure Dry-Gel Conversion Method for Zeolite MFI Synthesis Using Ionic Liquid and Microwave Heating. *Journal of the American Chemical Society* 2010, **132**(37): 12776-12777.
- (66) Alia S.M., Zhang G., Kisailus D., Li D., Gu S., Jensen K., Yan Y., Porous Platinum Nanotubes for Oxygen Reduction and Methanol Oxidation Reactions. *Advanced Functional Materials* 2010, **20**(21): 3742-3746.
- (67) Zhang T., Zhang Q., Ge J., Goebel J., Sun M., Yan Y., Liu Y.-S., Chang C., Guo J., Yin Y., A Self-Templated Route to Hollow Silica Microspheres. *Journal of Physical Chemistry C* 2009, **113**(8): 3168-3175.
- (68) Wang Z., Ge Q., Shao J., Yan Y., High Performance Zeolite LTA Pervaporation Membranes on Ceramic Hollow Fibers by Dipcoating-Wiping Seed Deposition. *Journal of the American Chemical Society* 2009, **131**(20): 6910-+.
- (69) Sun M., Maichen W., Pophale R., Liu Y., Cai R., Lew C.M., Hunt H., Deem M.W., Davis M.E., Yan Y., Dielectric constant measurement of zeolite powders by time-domain reflectometry. *Microporous and Mesoporous Materials* 2009, **123**(1-3): 10-14.
- (70) Liu Y., Lew C.M., Sun M., Cai R., Wang J., Kloster G., Boyanov B., Yan Y., On-Wafer Crystallization of Ultralow-kappa Pure Silica Zeolite Films. *Angewandte Chemie-International Edition* 2009, **48**(26): 4777-4780.
- (71) Lew C.M., Sun M., Liu Y., Wang J., Yan Y., PURE-SILICA-ZEOLITE LOW-DIELECTRIC CONSTANT MATERIALS. *Ordered Porous Solids: Recent Advances and Prospects* 2009: 335-364.
- (72) Lew C.M., Liu Y., Day B., Kloster G.A., Tiznado H., Sun M., Zaera F., Wang J., Yan Y., Hydrofluoric-Acid-Resistant and Hydrophobic Pure-Silica-Zeolite MEL Low-Dielectric-Constant Films. *Langmuir* 2009, **25**(9): 5039-5044.
- (73) Kim H., Deng W.-Q., Goddard W.A., III, Jang S.S., Davis M.E., Yan Y., Sodium Diffusion through Aluminum-Doped Zeolite BEA System: Effect of Water Solvation. *Journal of Physical Chemistry C* 2009, **113**(3): 819-826.
- (74) Gu S., Cai R., Luo T., Chen Z., Sun M., Liu Y., He G., Yan Y., A Soluble and Highly Conductive Ionomer for High-Performance Hydroxide Exchange Membrane Fuel Cells. *Angewandte Chemie-International Edition* 2009, **48**(35): 6499-6502.
- (75) Ge Q., Wang Z., Yan Y., High-Performance Zeolite NaA Membranes on Polymer-Zeolite Composite Hollow Fiber Supports. *Journal of the American Chemical Society* 2009, **131**(47): 17056-+.
- (76) Chen G., Beving D.E., Bedi R.S., Yan Y.S., Walker S.L., Initial Bacterial Deposition on Bare and Zeolite-Coated Aluminum Alloy and Stainless Steel. *Langmuir* 2009, **25**(3): 1620-1626.
- (77) Bedi R.S., Zanello L.P., Yan Y., Osteoconductive and Osteoinductive Properties of Zeolite MFI Coatings on Titanium Alloys. *Advanced Functional Materials* 2009, **19**(24): 3856-3861.
- (78) Bedi R.S., Beving D.E., Zanello L.P., Yan Y., Biocompatibility of corrosion-resistant zeolite coatings for titanium alloy biomedical implants. *Acta Biomaterialia* 2009, **5**(8): 3265-3271.
- (79) Alabi C.A., Chen Z., Yan Y.S., Davis M.E., Insights into the Nature of Synergistic Effects in Proton-Conducting 4,4'-1H,1H-Bitriazole-Poly(ethylene oxide) Composites. *Chemistry of Materials* 2009, **21**(19): 4645-4652.

- (80) Xu L., Chen Z., Chen W., Mulchandani A., Yan Y., Electrochemical synthesis of perfluorinated ion doped conducting polyaniline films consisting of helical fibers and their reversible switching between superhydrophobicity and superhydrophilicity. *Macromolecular Rapid Communications* 2008, **29**(10): 832-838.
- (81) Shanahan P.V., Xu L., Liang C., Waje M., Dai S., Yan Y.S., Graphitic mesoporous carbon as a durable fuel cell catalyst support. *Journal of Power Sources* 2008, **185**(1): 423-427.
- (82) McKeen J.C., Yan Y.S., Davis M.E., Proton conductivity in sulfonic acid-functionalized zeolite beta: Effect of hydroxyl group. *Chemistry of Materials* 2008, **20**(12): 3791-3793.
- (83) McKeen J.C., Yan Y.S., Davis M.E., Proton Conductivity of Acid-Functionalized Zeolite Beta, MCM-41, and MCM-48: Effect of Acid Strength. *Chemistry of Materials* 2008, **20**(16): 5122-5124.
- (84) Liu Y., Sun M., Lew C.M., Wang J., Yan Y., MEL-type pure-silica zeolite nanocrystals prepared by an evaporation-assisted two-stage synthesis method as ultra-low-k materials. *Advanced Functional Materials* 2008, **18**(12): 1732-1738.
- (85) Liu J., Aguilar G., Munoz R., Yan Y., Hydrophilic zeolite coatings for improved heat transfer: A quantitative analysis. *Aiche Journal* 2008, **54**(3): 779-790.
- (86) Lew C.M., Li Z., Li S., Hwang S.-J., Liu Y., Medina D.I., Sun M., Wang J., Davis M.E., Yan Y., Pure-Silica-Zeolite MFI and MEL Low-Dielectric-Constant Films with Fluoro-Organic Functionalization. *Advanced Functional Materials* 2008, **18**(21): 3454-3460.
- (87) Kristian N., Yan Y., Wang X., Highly efficient submonolayer Pt-decorated Au nano-catalysts for formic acid oxidation. *Chemical Communications* 2008(3): 353-355.
- (88) Johnson M.C., Lew C.M., Yan Y., Wang J., Hydrophobicity-dependent friction and wear of spin-on zeolite thin films. *Scripta Materialia* 2008, **58**(1): 41-44.
- (89) Holmberg B.A., Wang X., Yan Y., Nanocomposite fuel cell membranes based on Nafion and acid functionalized zeolite beta nanocrystals. *Journal of Membrane Science* 2008, **320**(1-2): 86-92.
- (90) Cai R., Yan Y., Corrosion-resistant zeolite coatings. *Corrosion* 2008, **64**(3): 271-278.
- (91) Cai R., Sun M., Chen Z., Munoz R., O'Neill C., Beving D.E., Yan Y., Ionothermal synthesis of oriented zeolite AEL films and their application as corrosion-resistant coatings. *Angewandte Chemie-International Edition* 2008, **47**(3): 525-528.
- (92) Beving D.E., O'Neill C.R., Yan Y., Hydrophilic and antimicrobial low-silica-zeolite LTA and high-silica-zeolite MFI hybrid coatings on aluminum alloys. *Microporous and Mesoporous Materials* 2008, **108**(1-3): 77-85.
- (93) Wang X., Liu R., Waje M.M., Chen Z., Yan Y., Bozhilov K.N., Feng P., Sulfonated ordered mesoporous carbon as a stable and highly active protonic acid catalyst. *Chemistry of Materials* 2007, **19**(10): 2395-2397.
- (94) Tang J.M., Jensen K., Waje M., Li W., Larsen P., Pauley K., Chen Z., Ramesh P., Itkis M.E., Yan Y., Haddon R.C., High performance hydrogen fuel cells with ultralow Pt loading carbon nanotube thin film catalysts. *Journal of Physical Chemistry C* 2007, **111**(48): 17901-17904.
- (95) Tang J.M., Jensen K., Li W., Waje M., Larsen P., Ramesh P., Itkis M.E., Yan Y., Haddon R.C., Carbon nanotube free-standing membrane of Pt/SWNTs as catalyst layer in hydrogen fuel cells. *Australian Journal of Chemistry* 2007, **60**(7): 528-532.

- (96) Nakano H., Li W., Xu L., Chen Z., Waje M., Kuwabata S., Yan Y., Carbon nanotube and carbon black supported platinum nanocomposites as oxygen reduction electrocatalysts for polymer electrolyte fuel cells. *Electrochemistry* 2007, **75**(9): 705-708.
- (97) Lew C.M., Li Z., Zones S.I., Sun M., Yan Y., Control of size and yield of pure-silica-zeolite MFI nanocrystals by addition of methylene blue to the synthesis solution. *Microporous and Mesoporous Materials* 2007, **105**(1-2): 10-14.
- (98) Johnson M.C., Wang J., Li Z., Lew C.A., Yan Y., Effect of calcination and polycrystallinity on mechanical properties of nanoporous MFI zeolites. *Materials Science and Engineering a-Structural Materials Properties Microstructure and Processing* 2007, **456**(1-2): 58-63.
- (99) Johnson M., Li Z., Wang J., Yan Y., Mechanical characterization of zeolite low dielectric constant thin films by nanoindentation. *Thin Solid Films* 2007, **515**(6): 3164-3170.
- (100) Jeong B.-H., Hoek E.M.V., Yan Y., Subramani A., Huang X., Hurwitz G., Ghosh A.K., Jawor A., Interfacial polymerization of thin film nanocomposites: A new concept for reverse osmosis membranes. *Journal of Membrane Science* 2007, **294**(1-2): 1-7.
- (101) Guo J., Sun G., Wu Z., Sun S., Yan S., Cao L., Yan Y., Su D., Xin Q., The durability of polyol-synthesized PtRu/C for direct methanol fuel cells. *Journal of Power Sources* 2007, **172**(2): 666-675.
- (102) Guo J., Sun G., Sun S., Yan S., Yang W., Qi J., Yan Y., Xin Q., Polyol-synthesized PtRu/C and PtRu black for direct methanol fuel cells. *Journal of Power Sources* 2007, **168**(2): 299-306.
- (103) Choi J., Lai Z., Ghosh S., Beving D.E., Yan Y., Tsapatsis M., Layer-by-layer deposition of barrier and permselective c-Oriented-MCM-22/silica composite films. *Industrial & Engineering Chemistry Research* 2007, **46**(22): 7096-7106.
- (104) Chen Z., Waje M., Li W., Yan Y., Supportless Pt and PtPd nanotubes as electrocatalysts for oxygen-reduction reactions. *Angewandte Chemie-International Edition* 2007, **46**(22): 4060-4063.
- (105) Wang X., Li W., Chen Z., Waje M., Yan Y., Durability investigation of carbon nanotube as catalyst support for proton exchange membrane fuel cell. *Journal of Power Sources* 2006, **158**(1): 154-159.
- (106) Tang J.M., Itkis M.E., Wang C., Wang X., Yan Y., Haddon R.C., Carbon nanotube free-standing membrane as gas diffusion layer in hydrogen fuel cells. *Micro & Nano Letters* 2006, **1**(1): 62-65.
- (107) O'Neill C., Beving D.E., Chen W., Yan Y.S., Durability of hydrophilic and antimicrobial zeolite coatings under water immersion. *Aiche Journal* 2006, **52**(3): 1157-1161.
- (108) Li Z., Johnson M.C., Sun M., Ryan E.T., Earl D.J., Maichen W., Martin J.I., Li S., Lew C.M., Wang J., Deem M.W., Davis M.E., Yan Y., Mechanical and dielectric properties of pure-silica-zeolite low-k materials. *Angewandte Chemie-International Edition* 2006, **45**(38): 6329-6332.
- (109) Li W., Wang X., Chen Z., Waje M., Yan Y., Pt-Ru supported on double-walled carbon nanotubes as high-performance anode catalysts for direct methanol fuel cells. *Journal of Physical Chemistry B* 2006, **110**(31): 15353-15358.
- (110) Hu L.L., Wang J.L., Li Z.J., Li S., Yan Y.S., Interfacial adhesion of nanoporous zeolite thin films. *Journal of Materials Research* 2006, **21**(2): 505-511.
- (111) Holmberg B.A., Yan Y.S., An apparatus for direct proton conductivity measurement of powdered materials. *Journal of the Electrochemical Society* 2006, **153**(1): A146-A149.
- (112) Gao D., McBean N., Schultz J.S., Yan Y.S., Mulchandani A., Chen W.F., Fabrication of antibody arrays

- using thermally responsive elastin fusion proteins. *Journal of the American Chemical Society* 2006, **128**(3): 676-677.
- (113) Chen Z., Xu L., Li W., Waje M., Yan Y., Polyaniline nanofibre supported platinum nanoelectrocatalysts for direct methanol fuel cells. *Nanotechnology* 2006, **17**(20): 5254-5259.
- (114) Chen Z., Holmberg B., Li W., Wang X., Deng W., Munoz R., Yan Y., Nafion/zeolite nanocomposite membrane by in situ crystallization for a direct methanol fuel cell. *Chemistry of Materials* 2006, **18**(24): 5669-5675.
- (115) Beving D.E., McDonnell A.M.P., Yang W.S., Yan Y.S., Corrosion resistant high-silica-zeolite MFI coating - One general solution formulation for aluminum alloy AA-2024-T3, AA-5052-H32, AA-6061-T4, and AA-7075-T6. *Journal of the Electrochemical Society* 2006, **153**(8): B325-B329.
- (116) Xu L.B., Chen W., Mulchandani A., Yan Y.S., Reversible conversion of conducting polymer films from superhydrophobic to superhydrophilic. *Angewandte Chemie-International Edition* 2005, **44**(37): 6009-6012.
- (117) Wang X., Waje M., Yan Y.S., CNT-based electrodes with high efficiency for PEMFCs. *Electrochemical and Solid State Letters* 2005, **8**(1): A42-A44.
- (118) Waje M.M., Wang X., Li W.Z., Yan Y.S., Deposition of platinum nanoparticles on organic functionalized carbon nanotubes grown in situ on carbon paper for fuel cells. *Nanotechnology* 2005, **16**(7): S395-S400.
- (119) Munoz R.A., Beving D., Yan Y.S., Hydrophilic zeolite coatings for improved heat transfer. *Industrial & Engineering Chemistry Research* 2005, **44**(12): 4310-4315.
- (120) Munoz R., Beving D., Mao Y.C., Yan Y.S., Zeolite Y coatings on Al-2024-T3 substrate by a three-step synthesis method. *Microporous and Mesoporous Materials* 2005, **86**(1-3): 243-248.
- (121) McDonnell A.M.P., Beving D., Wang A.J., Chen W., Yan Y.S., Hydrophilic and antimicrobial zeolite coatings for gravity-independent water separation. *Advanced Functional Materials* 2005, **15**(2): 336-340.
- (122) Li Z.J., Lew C.M., Li S., Medina D.I., Yan Y.S., Pure-silica-zeolite MEL low-k films from nanoparticle suspensions. *Journal of Physical Chemistry B* 2005, **109**(18): 8652-8658.
- (123) Li W.Z., Wang X., Chen Z.W., Waje M., Yan Y.S., Carbon nanotube film by filtration as cathode catalyst support for proton-exchange membrane fuel cell. *Langmuir* 2005, **21**(21): 9386-9389.
- (124) Li W.Z., Sun G.Q., Yan Y.S., Qin X., Supported noble metal electrocatalysts in low temperature fuel cells. *Progress in Chemistry* 2005, **17**(5): 761-772.
- (125) Li S., Li Z.J., Medina D., Lew C., Yan Y.S., Organic-functionalized pure-silica-zeolite MFI low-k films. *Chemistry of Materials* 2005, **17**(7): 1851-1854.
- (126) Holmberg B.A., Hwang S.J., Davis M.E., Yan Y.S., Synthesis and proton conductivity of sulfonic acid functionalized zeolite BEA nanocrystals. *Microporous and Mesoporous Materials* 2005, **80**(1-3): 347-356.
- (127) Chen Z.W., Li S., Yan Y.S., Synthesis of template-free zeolite nanocrystals by reverse microemulsion-microwave method. *Chemistry of Materials* 2005, **17**(9): 2262-2266.
- (128) Wang X., Waje M., Yan Y.S., Methanol resistant cathodic catalyst for direct methanol fuel cells. *Journal of the Electrochemical Society* 2004, **151**(12): A2183-A2188.
- (129) Wang C., Waje M., Wang X., Tang J.M., Haddon R.C., Yan Y.S., Proton exchange membrane fuel cells with carbon nanotube based electrodes. *Nano Letters* 2004, **4**(2): 345-348.

- (130) Mitra A., Cao T.G., Wang H.T., Wang Z.B., Huang L.M., Li S., Li Z.J., Yan Y.S., Synthesis and evaluation of pure-silica-zeolite BEA as low dielectric constant material for microprocessors. *Industrial & Engineering Chemistry Research* 2004, **43**(12): 2946-2949.
- (131) Luo H.M., Takata T., Lee Y.G., Zhao J.F., Domen K., Yan Y.S., Photocatalytic activity enhancing for titanium dioxide by co-doping with bromine and chlorine. *Chemistry of Materials* 2004, **16**(5): 846-849.
- (132) Luo H.M., Sun L., Lu Y.F., Yan Y.S., Electrodeposition of mesoporous semimetal and magnetic metal films from lyotropic liquid crystalline phases. *Langmuir* 2004, **20**(23): 10218-10222.
- (133) Li Z.J., Li S., Luo H.M., Yan Y.S., Effects of crystallinity in spin-on pure-silica-zeolite MFI low-dielectric-constant films. *Advanced Functional Materials* 2004, **14**(10): 1019-1024.
- (134) Li S., Wang X., Beving D., Chen Z.W., Yan Y.S., Molecular sieving in a nanoporous b-oriented pure-silica-zeolite MFI monocrystal film. *Journal of the American Chemical Society* 2004, **126**(13): 4122-4123.
- (135) Li S., Sun J.N., Li Z.J., Peng H.G., Gidley D., Ryan E.T., Yan Y.S., Evaluation of pore structure in pure silica zeolite MFI low-k thin films using positronium annihilation lifetime spectroscopy. *Journal of Physical Chemistry B* 2004, **108**(31): 11689-11692.
- (136) Li S., Li Z.J., Bozhilov K.N., Chen Z.W., Yan Y.S., TEM investigation of formation mechanism of monocrystal-thick b-oriented pure silica zeolite MFI film. *Journal of the American Chemical Society* 2004, **126**(34): 10732-10737.
- (137) Holmberg B.A., Wang H., Yan Y.S., High silica zeolite Y nanocrystals by dealumination and direct synthesis. *Microporous and Mesoporous Materials* 2004, **74**(1-3): 189-198.
- (138) Wang H.T., Holmberg B.A., Yan Y.S., Synthesis of template-free zeolite nanocrystals by using in situ thermoreversible polymer hydrogels. *Journal of the American Chemical Society* 2003, **125**(33): 9928-9929.
- (139) Luo H.M., Zhang J.F., Yan Y.S., Electrochemical deposition of mesoporous crystalline oxide semiconductor films from lyotropic liquid crystalline phases. *Chemistry of Materials* 2003, **15**(20): 3769-3773.
- (140) Luo H.M., Wang C., Yan Y.S., Synthesis of mesostructured titania with controlled crystalline framework. *Chemistry of Materials* 2003, **15**(20): 3841-3846.
- (141) Li S., Li Z.J., Yan Y.S., Ultra-low-k pure-silica zeolite MFI films using cyclodextrin as porogen. *Advanced Materials* 2003, **15**(18): 1528-+.
- (142) Li S., Demmelmaier C., Itkis M., Liu Z.M., Haddon R.C., Yan Y.S., Micropatterned oriented zeolite monolayer films by direct in situ crystallization. *Chemistry of Materials* 2003, **15**(14): 2687-2689.
- (143) Huang L.M., Wang H.T., Hayashi C.Y., Tian B.Z., Zhao D.Y., Yan Y.S., Single-strand spider silk templating for the formation of hierarchically ordered hollow mesoporous silica fibers. *Journal of Materials Chemistry* 2003, **13**(4): 666-668.
- (144) Huang L.M., Wang H.T., Chen J.X., Wang Z.B., Sun J.Y., Zhao D.Y., Yan Y.S., Synthesis, morphology control, and properties of porous metal-organic coordination polymers. *Microporous and Mesoporous Materials* 2003, **58**(2): 105-114.
- (145) Holmberg B.A., Wang H.T., Norbeck J.M., Yan Y.S., Controlling size and yield of zeolite Y nanocrystals using tetramethylammonium bromide. *Microporous and Mesoporous Materials* 2003, **59**(1): 13-28.
- (146) Wang H.T., Huang L.M., Holmberg B.A., Yan Y.S., Nanostructured zeolite 4A molecular sieving air

- separation membranes. *Chemical Communications* 2002(16): 1708-1709.
- (147) Wang H.T., Holmberg B.A., Yan Y.S., Homogeneous polymer-zeolite nanocomposite membranes by incorporating dispersible template-removed zeolite nanocrystals. *Journal of Materials Chemistry* 2002, **12**(12): 3640-3643.
- (148) Wang H.T., Holmberg B.A., Huang L.M., Wang Z.B., Mitra A., Norbeck J.M., Yan Y.S., Nafion-bifunctional silica composite proton conductive membranes. *Journal of Materials Chemistry* 2002, **12**(4): 834-837.
- (149) Mitra A., Wang Z.B., Cao T.G., Wang H.T., Huang L.M., Yan Y.S., Synthesis and corrosion resistance of high-silica zeolite MTW, BEA, and MFI coatings on steel and aluminum. *Journal of the Electrochemical Society* 2002, **149**(10): B472-B478.
- (150) Mitra A., Kirby C.W., Wang Z.B., Huang L.M., Wang H.T., Huang Y.N., Yan Y.S., Synthesis of pure-silica MTW powder and supported films. *Microporous and Mesoporous Materials* 2002, **54**(1-2): 175-186.
- (151) Huang L.M., Wang Z.B., Wang H.T., Cheng X.L., Mitra A., Yan Y.S., Polyaniline nanowires by electropolymerization from liquid crystalline phases. *Journal of Materials Chemistry* 2002, **12**(2): 388-391.
- (152) Huang L.M., Wang H.T., Wang Z.B., Mitra A.P., Zhao D., Yan Y.S., Cuprite nanowires by electrodeposition from lyotropic reverse hexagonal liquid crystalline phase. *Chemistry of Materials* 2002, **14**(2): 876-880.
- (153) Huang L.M., Wang H.T., Wang Z.B., Mitra A., Bozhilov K.N., Yan Y.S., Nanowire arrays electrodeposited from liquid crystalline phases. *Advanced Materials* 2002, **14**(1): 61-64.
- (154) Wang Z.B., Yan Y.S., Controlling crystal orientation in zeolite MFI thin films by direct in situ crystallization. *Chemistry of Materials* 2001, **13**(3): 1101-1107.
- (155) Wang Z.B., Yan Y.S., Oriented zeolite MFI monolayer films on metal substrates by in situ crystallization. *Microporous and Mesoporous Materials* 2001, **48**(1-3): 229-238.
- (156) Wang Z.B., Wang H.T., Mitra A., Huang L.M., Yan Y.S., Pure-silica zeolite low-k dielectric thin films. *Advanced Materials* 2001, **13**(10): 746-749.
- (157) Wang Z.B., Mitra A.P., Wang H.T., Huang L.M., Yan Y.S., Pure silica zeolite films as low-k dielectrics by spin-on of nanoparticle suspensions. *Advanced Materials* 2001, **13**(19): 1463+.
- (158) Wang H.T., Wang Z.B., Huang L.M., Mitra A., Yan Y.S., Surface patterned porous films by convection-assisted dynamic self-assembly of zeolite nanoparticles. *Langmuir* 2001, **17**(9): 2572-2574.
- (159) Wang H.T., Wang Z.B., Huang L.M., Mitra A., Holmberg B., Yan Y.S., High-surface-area zeolitic silica with mesoporosity. *Journal of Materials Chemistry* 2001, **11**(9): 2307-2310.
- (160) Wang H.T., Huang L.M., Wang Z.B., Mitra A., Yan Y.S., Hierarchical zeolite structures with designed shape by gel-casting of colloidal nanocrystal suspensions. *Chemical Communications* 2001(15): 1364-1365.
- (161) Wang H.T., Fang Y.E., Yan Y.S., Surface modification of chitosan membranes by alkane vapor plasma. *Journal of Materials Chemistry* 2001, **11**(5): 1374-1377.
- (162) Huang L.M., Wang Z.B., Wang H.T., Sun J.Y., Li Q.H., Zhao D.Y., Yan Y.S., Hierarchical porous structures by using zeolite nanocrystals as building blocks. *Microporous and Mesoporous Materials* 2001, **48**(1-3): 73-78.

- (163) Gao F., Lu Q.Y., Liu X.Y., Yan Y.S., Zhao D.Y., Controlled synthesis of semiconductor PbS nanocrystals and nanowires inside mesoporous silica SBA-15 phase. *Nano Letters* 2001, **1**(12): 743-748.
- (164) Cheng X.L., Wang Z.B., Yan Y.S., Corrosion-resistant zeolite coatings by in situ crystallization. *Electrochemical and Solid State Letters* 2001, **4**(5): B23-B26.
- (165) Wang H.T., Wang Z.B., Yan Y.S., Colloidal suspensions of template-removed zeolite nanocrystals. *Chemical Communications* 2000(23): 2333-2334.
- (166) Lai R., Yan Y.S., Gavalas G.R., Growth of ZSM-5 films on alumina and other surfaces. *Microporous and Mesoporous Materials* 2000, **37**(1-2): 9-19.
- (167) Huang L.M., Wang Z.B., Sun J.Y., Miao L., Li Q.Z., Yan Y.S., Zhao D.Y., Fabrication of ordered porous structures by self-assembly of zeolite nanocrystals. *Journal of the American Chemical Society* 2000, **122**(14): 3530-3531.
- (168) Yan Y.S., Davis M.E., Gavalas G.R., Preparation of highly selective zeolite ZSM-5 membranes by a post-synthetic coking treatment. *Journal of Membrane Science* 1997, **123**(1): 95-103.
- (169) Yan Y.S., Davis M.E., Gavalas G.R., Use of diffusion barriers in the preparation of supported zeolite ZSM-5 membranes. *Journal of Membrane Science* 1997, **126**(1): 53-65.
- (170) Yan Y.S., Tsapatsis M., Gavalas G.R., Davis M.E., ZEOLITE ZSM-5 MEMBRANES GROWN ON POROUS ALPHA-AL<sub>2</sub>O<sub>3</sub>. *Journal of the Chemical Society-Chemical Communications* 1995(2): 227-228.
- (171) Yan Y.S., Davis M.E., Gavalas G.R., PREPARATION OF ZEOLITE ZSM-5 MEMBRANES BY IN-SITU CRYSTALLIZATION ON POROUS ALPHA-AL<sub>2</sub>O<sub>3</sub>. *Industrial & Engineering Chemistry Research* 1995, **34**(5): 1652-1661.
- (172) Jiang S., Yan Y.S., Gavalas G.R., TEMPORARY CARBON BARRIERS IN THE PREPARATION OF H<sub>2</sub>-PERMSELECTIVE SILICA MEMBRANES. *Journal of Membrane Science* 1995, **103**(3): 211-218.
- (173) Yan Y.S., Xin Q., Jiang S.C., Guo X.X., INFRARED STUDIES OF CO AND OR NO ADSORPTION ON REDUCED W/AL<sub>2</sub>O<sub>3</sub> CATALYSTS. *Journal of Catalysis* 1991, **131**(1): 234-242.

### INVITED LECTURES

1. "Zeolite ZSM-5 membranes for separation and catalysis", **9/27/99**, Department of Chemistry, University of California, Riverside, California.
2. "Assembly of nanoporous thin films", **10/14/99**, Southern California Society for Microscopy and Microanalysis (SCSMM), University of California, Irvine, California.
3. "Zeolite thin films as low *k* inter-metal dielectrics", **1/28/00**, Honeywell Wafer Fabrication Materials, STAR Center, Sunnyvale, California.
4. "Zeolite thin films and porous materials", **2/17/00**, Praxair Research Center, Tonawanda, New York.
5. "Zeolite membranes by in-situ crystallization", **3/10/00**, Kennecott Undergraduate Seminar, Chemical Engineering, University of Nevada at Reno, Reno, Nevada.
6. "Design, synthesis, and novel applications of zeolite thin film and coatings", **3/10/00**, Research Seminar, Chemical Engineering, University of Nevada at Reno, Reno, Nevada.
7. "Design, synthesis, and novel applications of zeolite thin film and coatings", **8/4/00**, Department of Applied Chemistry, Waseda University, Tokyo, Japan.
8. "Design, synthesis, and novel applications of zeolite thin film and coatings", **8/12/00**, Department of Chemistry, Jilin University, Changchun, China.
9. "Zeolite low-*k* dielectrics", **3/19/01**, Advanced Process Research & Development Laboratory (APRDL)

- of Motorola and AMD, Austin, Texas.
10. "Zeolite low-*k* dielectrics", **3/19/01**, International Sematech, Austin, Texas.
  11. "Zeolite low-*k* dielectrics", **4/20/01**, Advanced Micro Devices (AMD), Sunnyvale, California.
  12. "Design, synthesis, and novel applications of zeolite thin film and coatings", **5/15/01**, Chemical Engineering, University of Louisville, Louisville, Kentucky.
  13. "Zeolite low-*k* dielectrics", **8/2/01**, Novellus Systems, San Jose, California.
  14. "Design, synthesis, and environmental applications of zeolite based membrane and coatings", **9/10/01**, United States Environmental Protection Agency, Washington D.C.
  15. "Design, synthesis, and novel applications of zeolite thin film and coatings", **9/20/01**, Chemical Engineering, University of Southern California, Los Angeles, California.
  16. "Design, synthesis, and novel applications of zeolite thin film and coatings", **10/3/01**, Chemical Engineering, University of Rochester, Rochester, New York.
  17. "Design, synthesis, and novel applications of zeolite thin film and coatings", **10/15/01**, Chemical Engineering and Materials Science, University of California, Davis, California.
  18. "Fuel cells – power for the future", **2/27/02**, American Chemical Society, Orange County Section, University of California, Riverside, California.
  19. "Zeolite nanoparticles: building blocks for hierarchical porous structures", **4/29/02**, American Ceramic Society, St. Louis, Missouri.
  20. "Silica zeolite low-*k* dielectrics", **7/12/02**, Honeywell International, Sunnyvale, California.
  21. "Silica zeolite low-*k* dielectrics", **9/27/02**, Advanced Micro Devices (AMD), Sunnyvale, California.
  22. "Silica zeolite low-*k* dielectric thin films", **11/15/02**, Electrical Engineering and Computer Science, University of California, Berkeley, California.
  23. "Polymer-zeolite nanocomposite membranes", **11/18/02**, Twentieth Annual Membrane/Separations Technology Planning Conference, Newton, Massachusetts.
  24. "Design, synthesis, and novel applications of zeolite thin film and coatings", **11/21/02**, Chemical Engineering, University of Massachusetts, Amherst, Massachusetts.
  25. "Zeolite films: from chips to space station", **12/2/02**, Oak Ridge National Laboratory, Tennessee.
  26. "Zeolite films: from chips to space station", **1/17/03**, Chemical Engineering, University of California at Los Angeles, California.
  27. "Zeolite films: from chips to space station", **2/6/02**, Chemical Engineering, Northwestern University, Evanston, Illinois.
  28. "Zeolite thin films", **2/14/03**, First UC Symposium of Surface Science, University of California, Riverside, CA.
  29. "Silica zeolite low-*k* dielectric thin films", **4/4/03**, T. J. Watson Research Center, Yorktown Heights, New York.
  30. "Silica zeolite low-*k* dielectric thin films", **4/4/03**, Engelhard, Iselin, New Jersey.
  31. "Zeolite films: from chips to space station", **4/10/03**, Chemical Engineering, University of California, Santa Barbara, California.
  32. "Zeolite nanoparticles: building blocks for hierarchical porous structures", **4/15/03**, Chemical Engineering, University of Southern California, Los Angeles, California.
  33. "Microporous and mesoporous silica low-*k* dielectric thin films for computer chips", **8/1/03**, Pre-Conference School, The International Symposium on Zeolites and Microporous Crystals (ZMPC2003), The University of Tokyo, Japan (Cancelled due to SARS).
  34. "Zeolite thin films: from chips to space station", The International Symposium on Zeolites and Microporous Crystals (ZMPC2003), **8/3-6/03**, Sapporo, Japan (Cancelled due to SARS).
  35. "Silica zeolite low-*k* dielectric thin films", **8/20/03**, Intel, Portland, Oregon.
  36. "Hierarchically porous silica hollow fibers by spider silk templating", **10/7/03**, The 36<sup>th</sup> Annual Symposium of the Southern California American Vacuum Society Meeting, Anaheim, California.
  37. "Design, synthesis and novel applications of zeolite nanoparticles", **10/20/03**, The 55<sup>th</sup> Pacific Coast Regional and Basic Science Division Fall Meeting of the American Ceramic Society, Oakland, California.
  38. "Zeolite nanocomposite membranes and carbon nanotube based electrodes for fuel cells", **11/9/03-11/10/03**, The Knowledge Foundation's 4<sup>th</sup> Annual International Conference NANOSTRUCTURED MATERIALS 2003 – Production and Application in Fuel Cells & other Energy Devices, Miami Beach, Florida.
  39. "Zeolite thin films – from chips to space station", **11/13/03**, Department of Chemical Engineering,

- California Institute of Technology, California.
40. "Zeolite thin films – from chips to space station", **12/12/03**, Department of Chemistry, Fudan University, Shanghai, China.
  41. "Zeolite thin films: from chips to space station", **12/22/03**, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, China.
  42. "Zeolite nanoparticles: building blocks for hierarchical porous structures and functional films", **12/26/03**, Department of Chemistry, Jilin University, Changchun, China.
  43. "Zeolite nanoparticles: from computer chips to fuel cells", **3/9/04**, Nanoparticles 2004, Orlando, Florida.
  44. "Polymer-zeolite nanocomposite membranes for PEM fuel cells and gas separation", **3/29/04**, Session of Nanotechnology and the Environment, 2004 ACS Annual Meeting, Anaheim, California.
  45. "Silica Zeolite Low-*k* Dielectric Films", **3/28/04**, Session of Polymers in Micro- and Nano-Electronics, 2004 ACS Annual Meeting, Anaheim, California.
  46. "Zeolite thin films: from chips to space station", **4/21/04**, Department of Chemistry, Georgetown University, Washington D.C.
  47. "Zeolite thin films: from chips to space station", **9/23/04**, Department of Chemical Engineering, Ohio State University, Columbus, Ohio.
  48. "Fuel cells: acid functionalized zeolite polymer nanocomposite membranes and carbon nanotube based electrode catalyst", **11/10/04** [Cancelled due to illness], Department of Chemistry, University of California, Santa Barbara, California.
  49. "Portable power: a high energy density and low cost fuel cell", **11/11/04**, PROJECT T2 A Technology Transfer Conference, Larta Institute, Los Angeles, California.
  50. "Silica zeolite low-*k* films", **12/16/04**, Chevron-Texaco Research Center, Richmond, California.
  51. "Portable power: a high energy density and low cost fuel cell", **12/16/04**, Nanosys Inc., Palo Alto, California.
  52. "Carbon nanotube based electrocatalysts for fuel cells", **3/16/05**, Murphree Award Symposium in honor of M. E. Davis at the 2005 American Chemical Society Annual Meeting, San Diego, California.
  53. "Zeolite thin films and fuel cells", **3/22/05**, UOP, Des Plaines, Illinois.
  54. "Carbon nanotube based electrocatalysts for fuel cells", **5/19/05**, Oklahoma State Nanonet Conference, Oklahoma State University, Stillwater, Oklahoma.
  55. "Zeolite Thin Films: From Computer Chips to Space Station", **Gordon Research Conference** on Zeolite and Layer Materials, 7/3/05-7/8/05, Mount Holyoke College, South Hadley, Massachusetts.
  56. "Zeolite thin films: from chips to space station", **9/20/05**, Department of Chemical & Petroleum Engineering, University of Kansas, Lawrence, Kansas.
  57. "Zeolite thin films: from chips to space station", **10/12/05**, Department of Chemistry, University of La Verne, La Verne, California.
  58. "Zeolite thin films: from chips to space station", **12/15/05**, PACIFICHEM 2005, Honolulu, Hawaii.
  59. "Zeolite thin films: from chips to space station", **3/1/06**, Department of Chemistry, University of California Riverside, Riverside, California.
  60. "Engineering of zeolite coatings for corrosion protection of aluminum alloys", **3/12/06-3/16/06**, The Research Topical Symposium (RTS) – Smart Coatings: Advanced Function Using New Materials, at the 2006 Annual Meeting of the National Association for Corrosion Engineers, San Diego, California.
  61. "Carbon nanotube supported electrocatalysts for hydrogen and methanol fuel cells", **3/12/06-3/16/06**, The 135<sup>th</sup> TMS Annual Meeting, San Antonio, Texas.
  62. "Engineering and assembly of zeolite nanoparticles: from chips to fuel cells", **3/26/06-3/30/06**, Reaction and Supramolecular Assembly in Complex Fluids at the 2006 American Chemical Society Annual Meeting, Atlanta, Georgia.
  63. "Carbon nanotube supported electrocatalysts for hydrogen and methanol fuel cells", **3/26/06-3/30/06**, Nanoparticles in Energy Processes: Friend & Foe III. Nanoparticle-Based Catalysts and Sorbents at the 2006 American Chemical Society Annual Meeting, Atlanta, Georgia.
  64. "Advancing fuel cell technology by carbon nanotubes and zeolite nanoparticles", **5/1/06**, Virginia Tech, Department of Chemical Engineering, Blacksburg, Virginia.
  65. "Novel applications of zeolite thin films: past, present, and the future", **7/17/06**, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, China.
  66. "Zeolite thin films: from chips to space station", **7/20/06**, Dalian University of Technology, School of Chemical Engineering, Dalian, China.
  67. "Pure-silica-zeolite low-dielectric-constant films: past, present, and the future", **7/29/06**, Pre-conference

- School, the International Symposium on Zeolites and Microporous Crystals (ZMPC2006), Tokyo, Japan.
68. “Zeolite thin films: from chips to space station” [**Keynote Lecture**], 7/30/06-8/2/06, The International Symposium on Zeolites and Microporous Crystals (ZMPC2006), Yonago, Japan.
  69. “Zeolite thin films: from chips to space station – a progress report from 2000”, **8/9/06**, Jilin University, Department of Chemistry, Changchun, China.
  70. “Zeolite thin films: from chips to space station”, **8/18/06**, Zhejiang University of Technology, Hangzhou, China.
  71. “Novel applications of zeolite thin films: past, present, and the future”, **8/21/06**, Zhejiang University, Hangzhou, China.
  72. “Nanotechnology for cheaper and more durable fuel cells”, **3/8/07**, University of California – Canada Energy Workshop, University of California at Davis, CA.
  73. “Nanotechnology for cheaper and more durable fuel cells”, **3/29/07**, Department of Chemical Engineering, California Institute of Technology, Pasadena, CA.
  74. “Nanotechnology for cheaper and more durable fuel cells”, **4/13/07**, UC System-Wide Technology Transfer Forum on NANOTECHNOLOGY, San Francisco, CA.
  75. “Nanotechnology for cheaper and more durable fuel cells”, **8/6/07**, Jilin University, Department of Chemistry, Changchun, China.
  76. “Nanotechnology for cheaper and more durable fuel cells”, **8/10/07**, Peking University, Department of Chemistry, Beijing, China.
  77. “Advanced applications of zeolite thin films: beyond separation and catalysis” [**Keynote Lecture**], **8/12/07-8/17/07**, 15<sup>th</sup> International Zeolite Conference, Beijing, China.
  78. “Zeolite thin films: from computer chips to space station”, **8/18/07**, Institute of Process Engineering, Chinese Academy of Sciences, Beijing, Beijing, China.
  79. “Nanotechnology for cheaper and more durable fuel cells”, **8/23/07**, Zhejiang University, Department of Chemical and Biological Engineering, Hangzhou, China.
  80. “Nanotechnology for cheaper and more durable fuel cells”, **10/5/07**, University of California, Los Angeles, Department of Mechanical and Aerospace Engineering, Los Angeles, California.
  81. “Nanotechnology for cheaper and more durable fuel cells”, **12/14/07**, University of California, Los Angeles, Department of Materials Science, Los Angeles, California.
  82. “Zeolite thin films and coatings”, **1/10/08**, Qualcomm (broadcasted to their worldwide locations), San Jose, California.
  83. “Nanotechnology for cheaper and more durable fuel cells”, **1/25/08**, Arizona State University, Department of Chemical Engineering, Phoenix, Arizona.
  84. “Nanotechnology for cheaper and more durable fuel cells”, **2/12/08**, Georgia Institute of Technology, Department of Materials Science and Engineering, Atlanta, Georgia.
  85. “Zeolite Thin Films and Fuel Cells”, **3/28/08**, Pacific Northwest National Lab, Washington.
  86. “Zeolite thin films: From computer chips to space station”, **4/15/08**, Kansas State University, Department of Chemical Engineering, Manhattan, Kansas.
  87. “Zeolite Thin Films for Energy, Environment, and Electronics”, **5/23/08**, Acceptance Lecture of Changjiang Scholar Award, School of Chemical Engineering and Materials Science, Zhejiang University, Hangzhou, China.
  88. “Nanotechnology for cheaper and more durable fuel cells”, **5/26/08**, Dalian Institute of Chemical Physics Symposium (XVI) on Fuel Cells, Dalian, China.
  89. “Materials for Sustainable Energy: The Next Frontier for Chemical Engineering”, **7/26/08**, The 34<sup>th</sup> West Lake Forum, Zhejiang University, Hangzhou, China.
  90. “Zeolite thin films: From computer chips to space station”, **10/9/08**, Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, Minnesota.
  91. “Zeolite thin films: From computer chips to space station”, **10/22/08**, Department of Chemical Engineering, Texas A&M University, College Station, Texas.
  92. “Fuel cell vehicles of the future: The materials challenges to make it real”. **12/3/08**, University of California, Palm Desert Graduate Center, Palm Desert, California.
  93. “Zeolite thin films: From computer chips to space station”, **1/18/09**, Jilin University Zhuhai Workshop on Porous Materials, Zhuhai, China.
  94. “New fuel cell materials: Low-Pt and non-Pt catalysts and hydroxide exchange membranes”, **2/16 – 2/17/09**, Vancouver to Northeast USA Fuel Cell and Hydrogen Cluster Connection Workshop,

- Vancouver, Canada.
95. "Fuel cell vehicles of the future: The materials challenges to make it real", **4/4/09**, La Verne University, La Verne, CA.
  96. Panelist, "Energy Summit", Coachella Valley Association of Governors, **4/17/09**, Palm Springs, CA
  97. "Nanotechnology for cheaper and more durable fuel cells", **7/3/09**, The 4<sup>th</sup> Sino-US Nano Meeting, July 2-3, 2009, USTC, Hefei, China
  98. "Nanotechnology for cheaper and more durable fuel cells", **8/11/09**, Chemistry Department, Zhejiang University, Hangzhou China.
  99. "Nanotechnology for cheaper and more durable fuel cells", **8/15/09**, 2009 China – Workshop on Fuel Cell Science and Technology, Shanghai Jiao Tong University, China
  100. "Zeolite thin films: From computer chips to space station" **8/17/09 (Distinguished Lecture)**, Changchun Institute of Applied Chemistry, Changchun, China.
  101. "Quaternary Phosphonium based Polymers: A New Class of Hydroxide Exchange Membranes", **9/10/09**, 3<sup>rd</sup> Sunrise Springs Fuel Cell Workshop, Santa Fe, NM.
  102. "Zeolite thin films: From computer chips to space station", **10/14/09 (Plenary Lecture)**, The 15<sup>th</sup> Chinese National Zeolite Conference, Luoyang, Henan, China.
  103. "Nanotechnology for cheaper and more durable fuel cells", **10/28/09**, Department of Chemical Engineering, Yale University, New Haven, CT
  104. "Nanotechnology for cheaper and more durable fuel cells", **2/1/10**, Department of Electrical Engineering, University of California, Riverside, CA.
  105. "The Next 20 Years in Energy: Moving toward a clean/safe/sustainable energy future," **3/10/10**, Bourns College of Engineering 20<sup>th</sup> Anniversary Celebration, University of California, Riverside, CA.
  106. "Solar hydrogen and fuel cells: Toward a clean safe and sustainable energy future," **3/17/10**, Catalysis Center, University of Delaware.
  107. "Zeolite Thin Films: From computer chips to space station", **5/23-5/26/10 (Plenary Lecture)**, The 5<sup>th</sup> International Zeolite Membrane Meeting, Loutraki, Greece.
  108. "Solar hydrogen and fuel cells: Toward a clean safe and sustainable energy future", **6/5/10**, 5<sup>th</sup> Sino-US Nano Forum, Suzhou Institute of Nanotechnology and Nanobionics (SINANO), Chinese Academy of Sciences, Suzhou, China.
  109. "Solar hydrogen and fuel cells: Toward a clean safe and sustainable energy future", **6/10/10**, Department of Chemistry, Fudan University, China.
  110. "Fuel cells and solar hydrogen: Toward a clean safe and sustainable energy future", **7/11/10**, 8<sup>th</sup> International Symposium on New Materials and Nanomaterials for Electrochemical Systems, Shanghai, China.
  111. "Zeolite thin films: From computer chips to space station", **7/16/10**, Research Institute of Petroleum Processing, Sinopec, Beijing, China.
  112. "Polymer hydroxide exchange membranes: Fuel cells, energy storage, and solar hydrogen", **7/26/10**, Gordon Research Conference on Membranes, New London, NH.
  113. "Polymer hydroxide exchange membranes: Fuel cells, energy storage, and solar hydrogen", **8/24/10 (Plenary Lecture)**, The American Chemical Society Annual Fall Meeting, Boston, MA.
  114. "Fuel cells and solar hydrogen: Toward a clean safe and sustainable energy future", **8/31/10**, Department of Chemical and Biomolecular Engineering, University of Illinois, Urbana-Champaign, IL.
  115. "Polymer hydroxide exchange membranes: Fuel cells, energy storage, and solar hydrogen", **9/28/10**, F-Cell, Stuttgart, Germany.
  116. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **10/8/10**, Department of Chemical Engineering, University of California, Berkeley
  117. "Polymer hydroxide exchange membranes: Fuel cells, energy storage, and solar hydrogen", **10/10 – 10/15/10**, The Electrochemical Society Meeting, Las Vegas, NV.
  118. "Fuel cells and solar hydrogen: Toward a clean safe and sustainable energy future", **11/16/10**, Department of Chemical Engineering, University of Texas, Austin, TX.
  119. "Zeolite thin films: From computer chips to space station" **1/5/10**, Department of Chemical Engineering, Nanjing University of Technology, Nanjing, China.
  120. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **1/28/11**, Energy Materials Center, Cornell University, Ithaca, NY
  121. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **3/1/11**, Department of Chemical Engineering, University of New Mexico

122. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **3/18/11**, Department of Chemical Engineering, Michigan Technological University.
123. "Membranes: From zeolites to polymers", **3/29/11**, E. V. Murphree Award Symposium in honor of Norman Li, American Chemical Society Annual Meeting, Anaheim, CA.
124. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **4/28/11**, Department of Chemical Engineering, University of California, Santa Barbara, CA.
125. "Polymer Hydroxide Exchange Membranes: Fuel Cells, Energy Storage, and Solar Hydrogen", **7/2/11**, 6<sup>th</sup> Sino-US Nano Forum, Jilin University, Changchun, China.
126. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **7/8/11 (Distinguished Alumni Lecturer)**, Dalian Institute of Chemical Physics, Chinese Academy of Sciences
127. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **7/11/11**, School of Automotive Studies, Tongji University, Shanghai, China
128. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **10/6/11**, Center for Catalytic Science and Technology, Annual Review, University of Delaware, Newark, DE
129. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **10/26/11**, Department of Chemical Engineering, Lehigh University, Bethlehem, PA
130. "Hydroxide exchange membranes: Fuel cells, energy storage, and solar hydrogen", **11/9/11**, The 6<sup>th</sup> Sino-US Chemical Engineering Conference, Beijing, China
131. "Fuel cells, energy storage, and solar hydrogen: Toward a clean, safe and sustainable energy future", **11/10/11**, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing, China
132. "Fuel cells, energy storage, and solar hydrogen: Toward a clean, safe and sustainable energy future", **11/10/11**, School of Chemical Engineering, Beijing University of Chemical Technology, Beijing, China
133. "Fuel cells, energy storage, and solar hydrogen: Toward a clean, safe and sustainable energy future", **11/11/11**, Department of Chemical Engineering, Tianjin University, Tianjin, China
134. "Fuel cells, energy storage, and solar hydrogen: Toward a clean, safe and sustainable energy future", **11/14/11**, Department of Chemistry, Northeastern University, Shenyang, China
135. "Fuel cells, energy storage, and solar hydrogen: Toward a clean, safe and sustainable energy future", **12/5/11**, Department of Chemical Engineering, Stanford University, Palo Alto, CA
136. "Zeolite Thin Films: From Computer Chips to Space Station", **12/9/11**, Northeast Corridor Zeolite Association, University of Pennsylvania, Philadelphia, PA.
137. "Clean Energy: Flash without Flame", **3/7/12**, Distinguished Engineering Professor Inaugural Lecture, University of Delaware, Newark, DE
138. "Clean Energy: Flash without Flame", **3/29/12**, Daegu Gyeongbuk Institute of Science and Technology, Daegu, Korea
139. "Sustainable Energy: Flash without Flame", **4/15/12**, TEDxUD, Inaugural Meeting, University of Delaware, Newark, DE
140. "Clean Energy: Flash without Flame", **6/12/12**, University of Delaware Energy Institute (UDEI) Annual Review, University of Delaware, Newark, DE
141. "Zeolite Thin Films for Water and Energy Applications", **8/1/12 (Keynote Lecture)**, ZMPC 2012, Hiroshima, Japan
142. "Hydroxide Exchange Membranes for Energy Conversion and Storage", **8/22/2012**, The 1<sup>st</sup> International Symposium on Polymer Ecomaterials (PEM2012), Changchun, China
143. "Hydroxide exchange membrane fuel cells", **10/18/2012**, University of Delaware Energy Institute Fuel Cell Workshop.
144. "Zeolite thin films and coatings", **11/14/2012**, ExxonMobil, Clinton, NJ
145. "Hydroxide exchange membranes: Fuel cells, solar hydrogen and flow batteries", **1/10/2013**, Tsinghua and UD Workshop on Energy and Environment, Tsinghua University, Shenzhen, China.
146. "Clean energy: Hydroxide exchange membrane fuel cells and flow batteries", **5/15/13**, UD Energy Institute Annual Review.
147. "Hydroxide Exchange Membrane Fuel Cells: New Membranes and Catalysts", **6/14/2-13**, Dalian Institute of Chemical Physics Symposium on Fuel Cells, Dalian, China.
148. "Adamantane-Centered 3D Covalent Organic Frameworks as Ultra-Low-*k* Materials", **6/18/2013**, 6<sup>th</sup> International Zeolite Membrane Meeting (IZMM 2013), Jeju Island, South Korea.

149. "Hydroxide Exchange Membranes: Fuel cells, electrolyzers, solar hydrogen, and flow battery", **7/25/13**, Anion-Exchange Membranes for Energy Generation Technologies Workshop, University of Surrey, Guilford, UK.
150. "Nonprecious Metal Catalysts for Fuel Cells, Electrolyzers, and Solar Hydrogen Generators", **9/9/13**, American Chemical Society Meeting, Indianapolis, Indiana.
151. "Clean Energy: Flash without Flame", **9/26/13**, Department of Chemical Engineering, University of Missouri.
152. "Hydroxide exchange membranes and zeolite membranes", **11/8/13**, Air Liquide, Newark, DE.
153. "Clean Energy: Flash without Flame", **11/19/13**, University of Science and Technology of China, Hefei, China
154. "Hydroxide exchange membranes for electrochemical energy conversion and storage", **5/29/14**, Department of Applied Chemistry, Beijing University of Chemical Technology, Beijing, China.
155. "Hydroxide exchange membranes for electrochemical energy conversion and storage", **6/4/14**, The 5<sup>th</sup> AEARU5 Advanced Materials Workshop, Hong Kong University of Science and Technology, Hong Kong, China.
156. "Hydroxide exchange membranes for electrochemical energy conversion and storage", **7/20/14 (Keynote Lecture)**, The 10<sup>th</sup> International Congress on Membranes and Membrane Processes (ICOM2014), Suzhou, China.
157. "Hydroxide Exchange Membrane Fuel Cells: New Membranes and Catalysts", **7/24/14**, Wuhan University, China.
158. "Catalysts for Hydroxide Exchange Membrane Fuel Cells", **7/28/14**, Department of Applied Chemistry, Beijing University of Chemical Technology, Beijing, China.
159. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis for fuel cells", **11/14/14**, Annual Review, Center for Catalytic Science and Technology, University of Delaware, Newark, DE.
160. "Covalent organic frameworks (COFs): From design to applications", **11/12/14**, ExxonMobil, Clinton, NJ.
161. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis for fuel cells", **11/12/14**, The Catalysis Society of New York, Summerset, New Jersey.
162. "Polymer Hydroxide Exchange Membranes for Electrochemical Energy Conversion and Storage", **11/17/14**, Membrane Research and Innovation Activities around the World, American Institute of Chemical Engineers Annual Meeting, Atlanta, GA.
163. "Double Membrane Redox Flow Batteries for Economical and Efficient Renewable Electricity Storage", **11/17/14**, Inorganic Materials Plenary: Honorary Session for Prof. Michael Tsapatsis, American Institute of Chemical Engineers Annual Meeting, Atlanta, GA.
164. "Covalent organic frameworks (COFs): from design to applications", **12/15/14**, Northeast Corridor Zeolite Association, University of Pennsylvania, Philadelphia, PA.
165. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **1/13/15**, Chemical Engineering, Drexel, Philadelphia, PA.
166. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **3/5/15**, Chemical Engineering, Ohio State University, Columbus, OH.
- 167.

### **CURRENT POSTDOCS, STUDENTS, AND VISITING FACULTY**

| <b>Postdocs/Staff</b> | <b>Date in Yan Lab</b> |
|-----------------------|------------------------|
| Shuang Gu             | 08/2008-               |
| Qianrong Fang         | 10/2009-               |
| Junhua Wang           | 01/2011-               |
| Zhongbin Zhuang       | 05/2011-               |
| Yun Zhao              | 11/2013-               |

| <b>Visiting Faculty</b> | <b>Date in Yan Lab</b> |
|-------------------------|------------------------|
|-------------------------|------------------------|

| <b>Graduate Student</b>        | <b>Date in Yan Lab</b> |
|--------------------------------|------------------------|
| Laj Xiong                      | 2008-                  |
| Bingzi Zhang                   | 2009-                  |
| Jie Zheng                      | 2010-                  |
| Robert Kaspar                  | 2010-                  |
| Jarrid Wittkopf                | 2010-                  |
| Mariah Woodroof                | 2011-                  |
| Ke Gong                        | 2011-                  |
| Myat Myint (w/i J.G.Chen)      | 2011-                  |
| Lizzy Mahoney (w/i J. G. Chen) | 2011-                  |
| Andrew Tibbits (w/i C. Kloxin) | 2012-                  |
| Stephen Giles (w/i D. Vlachos) | 2013-                  |
| Marco Dunwell (w/i B. Xu)      | 2013-                  |
| Rose Ma                        | 2013-                  |
| Jared Nash                     | 2014-                  |
| Hao Wang                       | 2014-                  |

| <b>Undergraduate Student</b> | <b>Date in Yan Lab</b> | <b>Current Institution</b> |
|------------------------------|------------------------|----------------------------|
| Michael Letterio             | 2013-                  |                            |
| Kevin Kuttler                | 2013-                  |                            |
| Jonathan Grunewald           | 2014-                  |                            |
| Kelsey Yeager                | 2014-                  |                            |
| Brandon Zhang                | 2014-                  |                            |
| Fei Xu                       | 2014-                  |                            |