

Dongxia Liu, Ph.D.

I. Personal Information

A. Contact Information

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B. Academic Appointments

Professor	Dept. Chemical & Biomolecular Engineering <i>University of Delaware (UD)</i>	01/2023-present
Professor	Dept. Chemical & Biomolecular Engineering <i>University of Maryland, College Park (UMD)</i>	08/2022-01/2023
Associate Professor	Dept. Chemical & Biomolecular Engineering <i>University of Maryland, College Park (UMD)</i>	08/2018-08/2022
Assistant Professor	Dept. Chemical & Biomolecular Engineering <i>University of Maryland, College Park (UMD)</i>	01/2012-08/2018

C. Other Employment

Postdoctoral Research Associate	Department of Chemical Engineering and Materials Science, <i>University of Minnesota at Twin Cities, MN</i> Advisor: Profs. Michael Tsapatsis & Aditya Bhan Project: 2D Zeolites: Synthesis and Catalysis Applications	06/2009-12/2011
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D. Educational Background

Philosophiae Doctor (Ph.D.)	Department of Chemical Engineering <i>University of Rochester, NY, USA</i> Advisor: Prof. Matthew Z. Yates <i>Thesis: Engineering particle morphology and assembly for proton conducting fuel cell membrane applications</i>	09/2004-05/2009
Master of Science (M.S.)	Institute of Chemistry, <i>Chinese Academy of Sciences, Beijing, China</i> Advisor: Prof. Buxing Han <i>Thesis: Investigation on property and applications of reverse micelles under supercritical carbon dioxide</i>	09/2000-12/2003
Bachelor of Science (B.S.)	Department of Chemistry, <i>Shandong University, Ji'nan, China</i> Advisor: Prof. Zonglin Liu <i>Thesis: Synthesis, purification and characterization of a tri-block silicone copolymer</i>	09/1996-07/2000

II. Research, Scholarly and Creative Activities

(Members of Liu's group are marked in bold. Graduate and undergraduate students are indicated by [†] and [§], respectively. Corresponding authors are underlined.)

A. Invited and Refereed Book Chapters

2. **Su Cheun Oh[†], Sichao Cheng[†], Ying Pan[†], Emily Schulman[†], and Dongxia Liu**, "Multifunctional Reactors for Direct Nonoxidative Methane Conversion", In book: **Direct Natural Gas Conversion to Value-Added Chemicals**, 2020, 305-330. doi: 10.1201/9780429022852-11

1. **Su Cheun Oh**[†], **Mann Sakbodin**[†], and **Dongxia Liu**, “Direct non-oxidative methane conversion in membrane reactor”, in book: **SPR Catalysis**, 2019, 31, 127-165. doi: 10.1039/9781788016971-00127

B. Articles in Refereed Journals

81. **Sichao Cheng**[†], **Su Cheun Oh**[†], **Mann Sakbodin**[†], Limei Qiu, Yuxia Diao and **Dongxia Liu**, “Understanding the impact of hydrogen activation by SrCe_{0.8}Zr_{0.2}O_{3-δ} perovskite membrane material on direct non-oxidative methane conversion”, **Frontier in Chemistry** (Manuscript in press).
80. Qi Dong, Yonggang Yao, **Sichao Cheng**[†], Konstantinos Alexopoulos, Jinlong Gao, Sanjana Srinivas, Yifan Wang, Yong Pei, Chaolun Zheng, Alexandra H. Brozena, Xizheng Wang, Jiaqi Dai, Hao Zhao, Weiqing, Zheng, Hilal Ezgi Toraman, Zhiwei Lin, Bao Yang, Yiguang Ju, **Dionisios G. Vlachos**, **Dongxia Liu**, **Liangbing Hu**, “Programmable heating and quenching for non-equilibrium thermochemical synthesis” **Nature** (Manuscript in press).
79. Shiba Adhikari, **Junyan Zhang**[†], Kinga Unocic, Evan Wegener, Pranaw Kunal, Dhruva Deka, Todd Toops, Sreshtha Sinha Majumdar, Theodore Krause, **Dongxia Liu**, and **Zhenglong Li**, “Direct 2,3-butanediol conversion to butene-rich C₃₊ olefins over Cu modified 2D pillared MFI: consequence of reduced diffusion length”, **ACS Sustainable Chemistry & Engineering** (Manuscript in press).
78. **Mann Sakbodin**[†], **Emily Schulman**[†], Yi-Lin Huang, **Ying Pan**[†], Eric D. Wachsman, and **Dongxia Liu**, “Direct non-oxidative methane conversion in an autothermal hydrogen-permeable membrane reactor” **Advanced Energy Materials** (Manuscript in press). doi: 10.1002/aenm.202102782
77. **Lu Liu**[†], **Dongxia Liu**, and **Chen Zhang** “High-temperature hydrogen/propane separations in asymmetric carbon molecular sieve hollow fiber membranes”, **Journal of Membrane Science**, 2022, 642, Article No. 119978. doi: 10.1016/j.memsci.2021.119978
76. Yunfei Yu, Chenchen Zhang, Jiufeng Fan, **Dongxia Liu**, and **Jianqiang Meng**, “A mixed matrix membrane for enhanced CO₂/N₂ separation via aligning hierarchical porous zeolite with a polyethersulfone based comb-like polymer”, **Journal of the Taiwan Institute of Chemical Engineers**, in press. doi: 10.1016/j.jtice.2021.10.032
75. Peihua Ma, Jinglin Zhang, Zi Teng, **Yuan Zhang**[†], Gary R. Bauchan, Yaguang Luo, **Dongxia Liu**, and **Qin Wang**, “Metal–Organic Framework–Stabilized High Internal Phase Pickering Emulsions Based on Computer Simulation for Curcumin Encapsulation: Comprehensive Characterization and Stability Mechanism”, **ACS Omega**, 2021, 6, 26556–26565. doi: 10.1021/acsomega.1c03932
74. **Junyan Zhang**[†], Eunji Yoo, Brian Henry Davison, **Dongxia Liu**, Joshua A Schaidle, Ling Tao, **Zhenglong Li**, “Towards cost-competitive middle distillate fuels from ethanol within a market-flexible biorefinery concept”, **Green Chemistry**, 2021, 23, 9534-9548. doi: 10.1039/D1GC02854E
73. **Ying Pan**[†], **Antara Bhowmick**[†], **Wei Wu**[†], **Yuan Zhang**[†], Yuxia Diao, Aiguo Zheng, Chen Zhang, Rongxuan Xie, **Zixiao Liu**[†], **Jianqiang Meng**, and **Dongxia Liu**, “Titanium Silicalite-1 Nanosheet Supported Platinum for Non-oxidative Ethane Dehydrogenation”, **ACS Catalysis**, 2021, 11, 9970-9985. doi: 10.1021/acscatal.1c02676
72. **Junyan Zhang**[†], Evan Wegener, Nohor Samad, James Harris, Kinga Unocic, Lawrence Allard, Stephen Purdy, Shiba Adhikari, Michael Cordon, Jeffrey Miller, Theodore Krause, **Sichao Cheng**[†], **Dongxia Liu**; Meijun Li, Xiao Jiang, Zili Wu, **Zhenglong Li**. “Isolated metal sites in Cu-Zn-Y/Beta for direct and selective butene-rich C₃₊ olefins formation from ethanol”, **ACS Catalysis**, 2021, 11, 9885-9897. doi: 10.1021/acscatal.1c02177

71. Michael J. Cordon, **Junyan Zhang**[†], Stephen C. Purdy, Evan C. Wegener, Kinga A. Unocic, Lawrence F. Allard, Mingxia Zhou, Rajeev S. Assary, Jeffrey T. Miller, Theodore R. Krause, Fan Lin, Huamin Wang, A. Jeremy Kropf, Ce Yang, **Dongxia Liu**, and Zhenglong Li, “Selective Butene Formation in Direct Ethanol-to-C₃₊-Olefin Valorization over Zn–Y/Beta and Single-Atom Alloy Composite Catalysts Using In Situ-Generated Hydrogen”, **ACS Catalysis**, 2021, 11, 7193-7209. doi: 10.1021/acscatal.1c01136
70. Hilal Ezgi Toraman, Konstantinos Alexopoulos, **Su Cheun Oh**[†], **Sichao Cheng**[†], **Dongxia Liu**, Dionisios G. Vlachos, “Ethylene production by direct conversion of methane over isolated single active centers”, **Chemical Engineering Journal**, 2021, 420, Article No.: 130493. doi: 10.1016/j.cej.2021.130493
69. **Wei Wu**[†], Haomin Song, Qiaoqiang Gan, and **Dongxia Liu**, “Decomposition of dimethyl methylphosphonate vapor on ultrathin-film titania photocatalytic light absorber”, **Chemosphere**, 2021, 274, Article No.: 129719. doi: 10.1016/j.chemosphere.2021.129719
68. Yao He, Junjie Chen, Didi Li, Qian Zhang, **Dongxia Liu**, Jingyong Liu, Xiaoqiang Ma, and Tiejun Wang, “Efficient production of aromatics by catalytic pyrolysis of fruit waste over zeolites with 3D pore topologies”, **Energy**, 2021, 223, Article No.: 120046. doi: 10.1016/j.energy.2021.120046
67. **Wei Wu**[†], Dat T. Tran, **Sichao Cheng**[†], **Yuan Zhang**[†], Na Li, Huiyong Chen, Ya-Huei (Cathy) Chin, Libo Yao, and **Dongxia Liu**, “Local environment and catalytic property of External Lewis acid sites in hierarchical lamellar titanium Silicalite-1 zeolites”, **Microporous and Mesoporous Materials**, 2021, 311, Article No.: 110710. doi: 10.1016/j.micromeso.2020.110710
66. **Mann Sakbodin**[†], **Emily Schulman**[†], **Ying Pan**[†], Eric D. Wachsman, and **Dongxia Liu**, “Methane-to-aromatics in a gas recycle methane reactor/hydrogen membrane separator”, **Catalysis Today**, 2021, 365, 80-87. doi: 10.1016/j.cattod.2020.06.028
65. Laleh Emdadi, Luther Mahoney, Ivan C. Lee, Asher C. Leff, **Wei Wu**[†], **Dongxia Liu**, Chi K. Nguyen, and Dat T. Tran, “Assessment of coke deposits on lamellar metal-modified MFI zeolites in ethylene transformation to aromatic liquids”, **Applied Catalysis A**, 2020, 595, Article No.: 117510. doi: 10.1016/j.apcata.2020.117510
64. Tianqi Zhang, Jian Yin, Ying Pan, Enhua Liu, **Dongxia Liu**, and Jianqiang Meng, “Hierarchical porous polyimide nanocomposite membrane for flow-through CO₂ cycloaddition at mild conditions”, **Chemical Engineering Journal**, 2020, 383, Article No.: 123166. doi: 10.1016/j.cej.2019.123166
63. **Mann Sakbodin**[†], **Emily Schulman**[†], **Su Cheun Oh**[†], **Ying Pan**[†], Eric D. Wachsman, and **Dongxia Liu**, “Dual utilization of greenhouse gases to produce C₂₊ hydrocarbons and syngas in a hydrogen-permeable membrane reactor”, **Journal of Membrane Science**, 2020, 595, Article No.: 117557. doi: 10.1016/j.memsci.2019.117557
62. Yao He, Si Chen, Junjie Chen, **Dongxia Liu**, Xunan Ning, Jingyong Liu, and Tiejun Wang, “Consequence of replacing nitrogen with carbon dioxide as atmosphere on suppressing the formation of polycyclic aromatic hydrocarbons in catalytic pyrolysis of sawdust”, **Bioresour Technol**, 2020, 297, Article No.: 122417. doi: 10.1016/j.biortech.2019.122417
61. Gaurav Kumar, **Dongxia Liu**, Dandan Xu, Limin Ren, Michael Tsapatsis, and Paul J. Dauenhauer, “Dehydro-decyclization of 2-methyltetrahydrofuran to pentadienes on boron-containing zeolites”, **Green Chemistry**, 2020, 22, 4147-4160. doi: 10.1039/D0GC00136H
60. **Emily Schulman**[†], **Wei Wu**[†], and **Dongxia Liu**, “Two-dimensional zeolite materials: structural and acidity properties”, **Materials**, 2020, 13, Article No.: 1822. doi: 10.3390/ma13081822
59. Luther Mahoney, Laleh Emdadi, Asher C. Leff, Dat T. Tran, **Wei Wu**[†], **Sichao Cheng**[†], **Dongxia Liu**, Chi K. Nguyen, and Ivan C. Lee, “Influences of metal-modification and lamellar zeolite structure on ethylene to liquid aromatics conversion reaction using MFI catalysts”, **Fuel**, 2019, 256, Article No.: 115953. doi: 10.1016/j.fuel.2019.115953
58. **Lu Wei**[†], **Kechen Song**[†], **Wei Wu**[†], Scott Holdren, Guanghui Zhu, **Emily Shulman**[†], Wenjin Shang, Huiyong Chen, Michael R. Zachariah, and **Dongxia Liu**, “Vapor-phase strategy to pillaring

- of two-dimensional zeolite”, *Journal of the American Chemical Society*, 2019, 141, 8712-8716. doi: 10.1021/jacs.9b03479
57. **Su Cheun Oh[†]**, **Emily Schulman[†]**, **Junyan Zhang[†]**, Jiufeng Fan, **Ying Pan[†]**, Jianqiang Meng, and **Dongxia Liu**, “Direct non-oxidative methane conversion in a millisecond catalytic wall reactor”, *Angewandte Chemie International Edition*, 2019, 58, 7083-7086. doi: 10.1002/anie.201903000
56. **Yiqing Wu[†]**, Scott Holdren, **Yuan Zhang[†]**, **Su Cheun Oh[†]**, Dat T. Tran, Laleh Emdadi, Zheng Lu, Mei Wang, Taylor J. Woehl, Michael Zachariah, Yu Lei, and **Dongxia Liu**, “Quantification of rhenium oxide dispersion on zeolite: Effect of zeolite acidity and mesoporosity”, *Journal of Catalysis*, 2019, 372, 128-141. doi: 10.1016/j.jcat.2019.02.024
55. **Wei Wu[†]**, Dat T. Tran, **Xianyuan Wu[†]**, **Su Cheun Oh[†]**, Manyun Wang, Huiyong Chen, **Laleh Emdadi[†]**, **Junyan Zhang[†]**, **Emily Schulman[†]**, and **Dongxia Liu**, “Multilamellar and pillared titanium Silicalite-1 with long-range order of zeolite nanosheet layers: Synthesis and catalysis”, *Microporous and Mesoporous Materials*, 2019, 278, 414-422. doi: 10.1016/j.micromeso.2019.01.010
54. Dandan Xu, Omar Abdelrahman, Sang Hyun Ahn, Yasmine Guefrachi, Anatoliy Kuznetsov, Limin Ren, Sonjong Hwang, Maryam Khaleel, Saeed Al Hassan, **Dongxia Liu**, Suk Bong Hong, Paul Dauenhauer, and **Michael Tsapatsis**, “A quantitative study of the structure–activity relationship in hierarchical zeolites using liquid phase reactions”, *AIChE Journal*, 2019, 65, 1067-1075. doi: 10.1002/aic.16503
53. **Junyan Zhang[†]**, Zheng Lu, **Wei Wu[†]**, Dat T. Tran, Wenjin Shang, Huiyong Chen, Yu Lei, Zhengloung Li, Mei Wang, Taylor J. Woehl, and **Dongxia Liu**, “Mesopore differences between pillared lamellar MFI and MWW zeolites probed by atomic layer deposition of titania and consequences on photocatalysis”, *Microporous and Mesoporous Materials*, 2019, 276, 260-269. doi: 10.1016/j.micromeso.2018.10.009
52. **Baoyu Liu[†]**, **Su Cheun Oh[†]**, Huiyong Chen, and **Dongxia Liu**, “The effect of oxidation of ethane to oxygenates on Pt- and Zn-containing LTA zeolites with tunable selectivity”, *Journal of Energy Chemistry*, 2019, 30, 42-48. doi: 10.1016/j.jechem.2018.04.001
51. **Laleh Emdadi[†]**, Dat T. Tran, **Emily Schulman[†]**, **Lu Wei[†]**, Wenjin Shang, Huiyong Chen, and **Dongxia Liu**, “Synthesis of hierarchical lamellar MFI zeolites with sequential intergrowth influenced by synthetic gel composition”, *Microporous and Mesoporous Materials*, 2019, 275, 31-41. doi: 10.1016/j.micromeso.2018.08.007
50. Haomin Song, **Wei Wu[†]**, Jian-Wei Liang, Partha Maity, Yuying Shu, Nam Sun Wang, Omar F. Mohammed, Boon S. Ooi, **Qiaoqiang Gan**, and **Dongxia Liu**, “Ultrathin-film titania photocatalyst on nanocavity for CO₂ reduction with boosted catalytic efficiencies”, *Global Challenges*, 2018, 2, article no.: 1800032. doi: 10.1002/gch2.201800032
49. Fan Liu, **Junyan Zhang[†]**, **Dongxia Liu**, and **Ya-Huei (Cathy) Chen**, “Cascade reactions in tunable lamellar micro- and mesopores for C=C bond coupling and hydrocarbon synthesis”, *Angewandte Chemie International Edition*, 2018, 130, 13068-13072. doi: 10.1002/ange.201803929
48. **Su Cheun Oh[†]**, Jiayi Xu, Dat T. Tran, Bin Liu, and **Dongxia Liu**, “Effects of controlled crystalline surface of hydroxyapatite on methane oxidation Reactions”, *ACS Catalysis*, 2018, 8, 4493-4507. doi: 10.1021/acscatal.7b04011
47. Jian Yin, Tianqi Zhang, **Emily Schulman[†]**, **Dongxia Liu** and **Jianqiang Meng**, “Hierarchical porous metallized poly-melamineformaldehyde (PMF) as a low-cost and high efficiency catalyst for cyclic carbonate synthesis from CO₂ and epoxides”, *Journal of Material Chemistry A*, 2018, 6, 8441-8448. doi: 10.1039/c8ta00625c
46. Yujia Liang, **Wei Wu[†]**, Peng Wang, Sz-Chian Liou, **Dongxia Liu**, and **Sheryl H. Ehrman**, “Scalable fabrication of SnO₂/eo-GO nanocomposites for the photoreduction of CO₂ to CH₄”, *Nano Research*, 2018, 11, 4049-4061. doi: 10.1007/s12274-018-1988-x
45. **Yuanyuan Bai[†]**, **Lu Wei[†]**, Mengfei Yang, Huiyong Chen, Scott Holdren, Guanghui Zhu, Dat T. Tran, Chunli Yao, Runcang Sun, Yanbo Pan, and **Dongxia Liu**, “Three-step cascade over a single

- catalyst: synthesis of 5-(ethoxymethyl)furfural from glucose over a hierarchical lamellar multi-functional zeolite catalyst”, **Journal of Materials Chemistry A**, 2018, 6, 7693-7705. doi: 10.1039/c8ta01242c
44. **Yiqing Wu**[†], **Laleh Emdadi**[†], **Emily Schulman**[†], Yuying Shu, Dat T. Tran, Xizheng Wang, and **Dongxia Liu**, “Overgrowth of lamellar silicalite-1 on MFI and BEA zeolites and its consequences on non-oxidative methane aromatization reaction”, **Microporous and Mesoporous Materials**, 2018, 263, 1-10. doi: /10.1016/j.micromeso.2017.11.040
43. Lu Liu, **Yiqing Wu**[†], Junkai Hu, **Dongxia Liu**, and **Michael R. Zachariah**, “Zeolite-supported iron oxides as durable and selective oxygen carriers for chemical looping combustion”, **Energy & Fuels**, 2017, 31, 11225-11233. doi: 10.1021/acs.energyfuels.7b01689
42. Thomas C. Hoff, Michael J. Holmes, Juan Proano-Aviles, **Laleh Emdadi**[†], **Dongxia Liu**, Robert C. Brown, and **Jean-Philippe Tessonnier**, “Decoupling the role of external mass transfer and intracrystalline pore diffusion on the selectivity of HZSM-5 for the catalytic fast pyrolysis of biomass”, **ACS Sustainable Chemistry & Engineering**, 2017, 5, 8766-8776. doi: 10.1021/acssuschemeng.7b01578
41. Yujia Liang, **Su Cheun Oh**[†], Xizheng Wang, Howard Glicksman, Peter Zavalij, **Dongxia Liu**, and **Sheryl Ehrman**, “Oxidation-resistant micron-sized Cu-Sn solid particles fabricated by a one-step and scalable method”, **RSC Advances**, 2017, 7, 23468-23477. doi: 10.1039/C7RA02080E
40. **Su Cheun Oh**[†], **Thien Nguyendo**[§], **Yao He**[†], **Amanda Filie**[§], **Yiqing Wu**[†], Dat T. Tran, Ivan C. Lee, and **Dongxia Liu**, “External surface and pore mouth catalysis in hydrolysis of inulin over zeolites with different micropore topology and mesoporosity”, **Catalysis Science & Technology**, 2017, 7, 1153-1166. doi: 10.1039/C6CY02613C
39. **Yiqing Wu**[†], Zheng Lu, Yu Lei, Shirin Norooz Oliaee, and **Dongxia Liu**, “Quantification of external surface and pore mouth acid sites in unit-cell thick pillared MFI and pillared MWW zeolites”, **Microporous Mesoporous Materials**, 2017, 241, 43-51. doi: 10.1016/j.micromeso.2016.12.004
38. **Laleh Emdadi**[†], Dat T. Tran, **Wei Wu**[†], Haomin Song, Qiaoqiang Gan, and **Dongxia Liu**, “Synthesis of titanosilicate pillared MFI zeolite as an efficient photocatalyst”, **RSC Advances**, 2017, 7, 3249-3256. doi: 10.1039/C6RA23959E
37. **Su Cheun Oh**[†], Yu Lei, Huiyong Chen, and **Dongxia Liu**, “Catalytic consequences of cation and anion substitutions on rate and mechanism of oxidative coupling of methane over hydroxyapatite catalysts”, **Fuel**, 2017, 191, 472-485. doi: 10.1016/j.fuel.2016.11.106
36. **Mann Sakbodin**[†], **Yiqing Wu**[†], **Su Cheun Oh**[†], **Eric D. Wachsman**, and **Dongxia Liu**, “Hydrogen permeable tubular membrane reactor: promoting conversion and product selectivity for non-oxidative activation of methane over Fe@SiO₂ catalyst”, **Angewandte Chemie International Edition**, 2016, 55, 16149–16152. doi: 10.1002/anie.201609991
35. **Laleh Emdadi**[†], Dat T. Tran, **Yiqing Wu**[†], **Su Cheun Oh**[†], Guanghui Zhu, Ivan C. Lee, and **Dongxia Liu**, “BEA nanosponge/ultra-thin lamellar MFI prepared in one-step: Integration of 3D and 2D zeolites into a composite for efficient alkylation reactions”, **Applied Catalysis A: General**, 2016, 530, 56-65. doi: 10.1016/j.apcata.2016.11.011
34. **Yiqing Wu**[†], Zheng Lu, **Laleh Emdadi**[†], **Su Cheun Oh**[†], Jing Wang, Yu Lei, Huiyong Chen, Dat T. Tran, Ivan C. Lee, and **Dongxia Liu**, “Tuning external surface of unit-cell thick pillared MFI and MWW zeolites by atomic layer deposition and its consequences on acid-catalyzed reactions”, **Journal of Catalysis**, 2016, 337, 177-187. doi: 10.1016/j.jcat.2016.01.031
33. **Laleh Emdadi**[†], **Su Cheun Oh**[†], **Yiqing Wu**[†], Shirin Norooz Oliaee, Yuxia Diao, Guanghui Zhu, and **Dongxia Liu**, “The role of external acidity of meso-/microporous zeolites in determining selectivity for acid-catalyzed reactions of benzyl alcohol”, **Journal of Catalysis**, 2016, 335, 165-174. doi: 10.1016/j.jcat.2015.12.021

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31. Peiyu Wang, Junwei Lang, **Dongxia Liu**, and **Xingbin Yan**, “TiO₂ embedded in carbon submicron-tablets: synthesis from a metal–organic framework precursor and application as a superior anode in lithium-ion batteries”, **Chemical Communications**, 2015, 51, 11370-11373. doi: 10.1039/C5CC01703C
30. **Baoyu Liu**[†], **Tery Wattanaprayoon**, **Laleh Emdadi**[†], and **Dongxia Liu**, “Synthesis of organic pillared MFI zeolite as bifunctional acid-base catalysts”, **Chemistry of Materials**, 2015, 27, 1479-1487. doi: 10.1021/cm5033833
29. **Yiqing Wu**[†], **Laleh Emdadi**[†], **Mann Sakhodin**[†], and **Dongxia Liu**, “Spatial distribution and catalytic performance of metal-acid sites in Mo/MFI catalysts with tunable meso/microporous lamellar zeolite structures”, **Journal of Catalysis**, 2015, 23, 100-111. doi: 10.1016/j.jcat.2014.12.022
28. Yan Kang, **Laleh Emdadi**[†], Michael J. Lee, **Dongxia Liu**, and **Baoxia Mi**, “Layer-by-layer assembly of zeolite-polyelectrolyte membranes: an approach to significantly increase zeolite loading in composite thin film”, **Environmental Science and Technology Letters**, 2014, 1, 504-509. doi: 10.1021/ez500335q
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26. **Guanghui Zhu**[†], **Richard Graver**[§], **Laleh Emdadi**[†], Kyu Yong Choi, and **Dongxia Liu**, “Synthesis of ZSM-5@UiO-66 core-shell particles as bifunctional catalysts”, **RSC Advances** 2014, 4, 30673-30676. doi: 10.1039/c4ra03129f
25. **Yao He**[†], **Thomas Hoff**[§], **Laleh Emdadi**[†], **Yiqing Wu**[†], **Judicael Bouraima**[§], and **Dongxia Liu**, “Catalytic consequences of micropore topology, mesoporosity, and acidity on the hydrolysis of sucrose over zeolite catalysts”, **Catalysis Science & Technology** 2014, 4, 3064-3073. doi: 10.1039/C4CY00360H
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23. **Yiqing Wu**[†], **Laleh Emdadi**[†], Zhuopeng Wang, Wei Fan, and **Dongxia Liu**, “Textural and catalytic properties of Mo loaded hierarchical meso-/microporous lamellar MFI and MWW zeolites for direct methane conversion”, **Applied Catalysis A** 2014, 470, 344-354. doi: 10.1016/j.apcata.2013.10.053
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20. Yi Huang, Jianfeng Yao, Xueyi Zhang, Chunhua (Charlie) Kong, Huiyong Chen, **Dongxia Liu**, Michael Tsapatsis, Matthew R. Hill, Anita J. Hill, and **Huangting Wang**, “Role of ethanol in sodalite crystallization in an ethanol-Na₂O-Al₂O₃-SiO₂-H₂O system”, **CrystEngComm** 2011, 13, 4714-4722. doi: 10.1039/C1CE05194F
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2. **Dongxia Liu**, Jianling Zhang, Buxing Han, Jiufeng Fan, Tiancheng Mu, Zhimin Liu, Weize Wu, and Jing Chen, “Effect of compressed CO₂ on the properties of AOT reverse micelles studied by spectroscopy and phase behavior”, **Journal of Chemical Physics** 2003, 119, 4873-4878. doi: 10.1063/1.1596872
1. Jianling Zhang, Buxing Han, Minghua Liu, **Dongxia Liu**, Zexuan Dong, Jun Liu, Dan Li, Jun Wang, Baozhong Dong, Hui Zhao, and Lixia Rong, “Ultrasonication-induced formation of silver nanofibers in reverse micelles and small-angle X-ray scattering studies”, **Journal of Physical Chemistry B** 2003, 107, 3679-3683. doi: 10.1021/jp026738f

C. Patents and Intellectual Property Filings

5. Eric D. Wachsman and Dongxia Liu, “Systems, methods, and devices for direct conversion of methane”, US Patent No. 10525407, January 7th, **2020**.
4. Dongxia Liu and Su-Cheun Oh, “Direct non-oxidative methane conversion in a catalytic wall reactor”, PCT Application No. US2019/058040, **2019**.
3. Dongxia Liu and Su-Cheun Oh, “Autothermal Millisecond Catalytic Wall Reactor for Direct Non-Oxidative Conversion of Natural Gas”, Provisional Patent Application No. PS-2018-121, **2018**.
2. Matthew Z. Yates and Dongxia Liu, “Ion-conducting ceramic apparatus, method, fabrication, and applications,” Number: U.S. 8,129,072, March 6th, **2012**.
1. Matthew Z. Yates and Dongxia Liu, “Ion/proton-conducting apparatus and method,” Number: U.S. 7,943,269, May 17th, **2011**.

III. Invited Talks

44. “2-Dimensional Zeolites: Synthesis and Catalysis for alkane dehydrogenation”, **WR Grace**, Columbia, MD (January 31st, 2022)
43. “Reactor Innovation for Direct Non-oxidative Methane Coupling”, Department of Chemical and Biological Engineering, **Princeton University**, Princeton, NJ (December 8th, 2021).
42. “Overcoming Thermodynamics and Kinetics Barriers of Direct Non-oxidative Methane Coupling by Reactor Innovation”, Department of Chemical and Biomolecular Engineering, **University of Maryland**, College Park, MD (September 21st, 2021).
41. “Isolated Single Metal Atoms Supported on Silica for One-Step Non-Oxidative Methane Upgrading to Hydrogen and Value-Added Hydrocarbons”, **Carbon Management and Oil and Gas Research Project Review Meeting**, Virtual Event, (August 24th, 2021).
40. “Defective Metal Oxide Support for High Metal Dispersion and Durability”, **EFRC Directors Monthly Meeting**, (April 19th, 2021).
39. “Methane-to-Aromatics in a Gas Recycle Methane Reactor/Hydrogen Membrane Separator”, **#ChemistsLive**, ACS Cross-Division Virtual Live Content Event, (September 25th, 2020).
38. “Quantification of Rhenium Oxide Dispersion on Zeolite Support: Effect of Acidity and Mesoporosity”, **258th ACS National Meeting & Exposition**, San Diego, CA, (August 28th, 2019).
37. “Synthesis of Ultra-Low Loadings of Catalysts for Hydrodeoxygenation (HDO) of Biomass”, **EFRC PI meeting**, Washington DC, (July 30th, 2019).
36. “Prototype Study of One-Step Membrane Reactor for Stranded Natural Gas to Liquids”, **MEI2 seed grant meeting**, UMD, (July 25th, 2019).
35. “One Step Methane Gas to Liquid Upgrading”, **Engineering Sustainability Day**, UMD, (April 22nd, 2019).
34. “Spatial Distribution and Catalytic Performance of Brønsted acid sites in 2D Zeolite Materials”, **APS March Meeting**, Boston MA, (March 4th, 2019).

33. “Two-Dimensional Layered Zeolites and Ceramic Membrane Reactors for Methane Upgrading”, **Tianjin Polytechnic University**, Tianjin, China, (September 26th, 2018).
32. “Gas Permeable Membrane Reactor for GHG Emission Reduction”, **Maryland Energy Innovation Institute Annual Meeting**, UMD, (August 27th, 2018).
31. “Catalyst Design and Reactor Development for Methane Upgrading”, joint **workshop between MEII and Daegu Gyeongbuk Institute of Science and Technology**, (July 19th, 2018).
30. “Two-Dimensional Layered Zeolites and Ceramic Membrane Reactors for Methane Upgrading”, **UOP**, Chicago, (April 13th, 2018).
29. “Hierarchical Lamellar Zeolites: Synthesis, Characterization and Catalysis for Energy Conversion Applications”, Swalm School of Chemical Engineering (ChE), **Mississippi State University**, (April 11th, 2018).
28. “Rate and mechanism of oxidative coupling of methane over hydroxyapatite-based catalysts”, **255th ACS National Meeting & Exposition**, New Orleans, Louisiana, (March 18th, 2018).
27. “Diversification of hierarchical two-dimensional zeolite structures for catalysis applications”, **255th ACS National Meeting & Exposition**, New Orleans, Louisiana, (March 18th, 2018).
26. “Catalysis and Materials Synthesis: Innovative Catalyst and Membrane Reactor for One-Step Methane Upgrading”, Department of Chemical & Biomolecular Engineering, **University of Maryland, College Park** (October 17th, 2017)
25. “Direct Methane Aromatization Reaction over Metal/Zeolite Catalysts”, **SABIC, Houston Campus**, Texas (August 2nd, 2016).
24. “Hierarchical Layered Zeolite with Tailored Textural and Catalytic Properties for Biomass Conversions” Department of Chemistry, **Renmin University of China**, Beijing, China (July 5th, 2016).
23. “Template Synthesis of Hierarchical Layered Zeolite with Tailored Textural and Catalytic Properties”, School of Chemistry and Chemical Engineering, **South China University of Technology**, Guangzhou, China (June 29th, 2016).
22. “Template Synthesis of Hierarchical Layered Zeolite with Tailored Textural and Catalytic Properties”, School of Chemistry and Chemical Engineering, **Guangdong University of Technology**, Guangzhou, China (June 29th, 2016).
21. “Engineering of Hierarchical Zeolite and Membrane Reactors for Energy Conversion Applications”, Department of Chemistry, **Central South University**, Changsha, China (June 27th, 2016).
20. “Ceramic Membrane Reactors for Energy Conversion Applications”, Department of Chemical Engineering, **University of New Hampshire**, Durham, NH (June 15th, 2016).
19. “Synthesis of Hierarchical Zeolites and Ceramic Membrane Reactors for Energy Conversion Applications”, Chemical Engineering, **University of Virginia**, Charlottesville, VA (April 27th, 2016).
18. “Designed Synthesis and Characterization of Hierarchical Zeolite Created by Dual Template Synthesis Method”, **ACS National Meeting**, San Diego, March 13-17, 2016.
17. “Direct Methane Aromatization Reaction over Metal/Zeolite Catalysts”, **Exxon Mobil, Houston Campus**, Texas (February 18th, 2016).
16. “Dual Template Synthesis of Hierarchical Zeolites and Structure Characterizations”, Ceramic Membrane Reactors for Energy Conversion Applications”, **W. R. Grace & Company**, Columbia, MD (January 19th, 2016).
15. “One-Step Dual Template Synthesis of Hierarchical Layered Zeolite with Tailored Textural and Catalytic Properties”, Department of Chemical & Biomolecular Engineering, **North Carolina State University**, Raleigh, NC (January 12th, 2015).
14. “Tailoring Meso-/microporous Layered Zeolites for Catalysis Applications”, **Northeast Corridor Zeolite Association**, Philadelphia, PA (December 12th, 2014).

13. “Designed Synthesis of Hierarchical Layered Zeolite with Tailored Textural and Catalytic Properties”, Department of Chemical Engineering, **West Virginia University**, Morgantown, WV (December 5th, 2014).
12. “Nanoporous Hierarchical Layered Zeolite for Energy Conversion Applications”, Department of Chemical & Biomolecular Engineering, **University of Akron**, Akron, OH (November 6th, 2014).
11. “Dual Template Synthesis of Meso-/microporous Layered Zeolite with Tailored Textural and Catalytic Properties” **Chevron**, Richmond, CA (August 12th, 2014).
10. “Pillared and Delaminated Zeolites for Catalysis and Separation Applications”, **NIST**, Gaithersburg, MD (August 30th, 2013).
9. “Catalytic Characterization of Meso-/microporous Lamellar Zeolite Catalysts”, The Third EITA Young Investigator Conference (**EITA-YIC**), Massachusetts Institute of Technology, Cambridge, MA (August 2nd, 2013).
8. “Synthesis, Characterization, and Catalytic Behavior of Lamellar MWW and MFI Zeolites with Dual Meso- and Micro-porosity”, **Catalysis Club of Philadelphia**, Wilmington, DE (May 9th, 2013).
7. “Synthesis, Characterization, and Catalytic Behavior of Lamellar MWW and MFI Zeolites with Dual Meso- and Micro-porosity”, Department of Chemistry Seminar, **University of Maryland**, College Park, MD (April 24th, 2013).
6. “Nanoporous Catalysts for Methane and Biomass Energy Conversions”, **UMERC, University of Maryland**, College Park, MD (March 21st, 2013).
5. “Synthesis and Catalytic Characterization of Mesoporous Lamellar MWW and MFI Zeolites”, **Qingdao Institute of Bioenergy and Bioprocess Technology**, Qingdao, China, (January 9th, 2013).
4. “Synthesis, Characterization, and Catalytic Behavior of MWW and MFI Zeolites with Dual Meso- and Micro-porosity”, **W. R. Grace & Company**, Columbia, MD (March 26th, 2012).
3. “Synthesis, Characterization, and Catalytic Behavior of MWW and MFI Zeolites with Dual Meso- and Micro-porosity”, Department of Chemical and Environmental Engineering, **University of California**, Riverside, CA (March 16th, 2011).
2. “Synthesis, Characterization, and Catalytic Behavior of MWW and MFI Zeolites with Dual Meso- and Micro-porosity”, Department of Chemical and Biomolecular Engineering, **University of Maryland**, College Park, MD (April 5th, 2011).
1. “Synthesis, Characterization, and Catalytic Behavior of MWW and MFI Zeolites with Dual Meso- and Micro-porosity”, Department of Chemical Engineering, **Wayne State University**, Detroit, MI (March 15th, 2011).

IV. Research and Professional Awards

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| 19. | Faculty-Student Research Award (FSRA), UMD | 2021 |
| 18. | Junior Faculty Outstanding Research Award, A. James Clark School of Eng. UMD | 2020 |
| 17. | The 10 th World Congress of Chemical Engineering Travel Grant | 2017 |
| 16. | The 13 th International Conference on Catalysis in Membrane Reactors Travel Award | 2017 |
| 15. | The 16 th International Congress on Catalysis Travel Award | 2016 |
| 14. | National Science Foundation (NSF) CAREER Award | 2014 |
| 13. | National Science Foundation (NSF) Travel Grant | 2014 |
| 12. | The ADVACNE Interdisciplinary & Engaged Research Seed Program Travel Award | 2013 |
| 11. | Research and Scholarship Award (RSA), University of Maryland | 2013 |
| 10. | Minta Martin Award, A. James Clark School of Engineering, UMD | 2012 |
| 9. | Second Place Poster Presentation Award at the Fuel Cell Seminar & Energy Exposition, Akron, OH | 2009 |
| 8. | Outstanding Ph.D. Dissertation Award, University of Rochester | 2009 |

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| 7. | Frank J. Horton Graduate Research Fellowship, University of Rochester (award period 2003-2009) | 2009 |
| 6. | Excellent Graduate Student Scholarship, Chinese Academy of Sciences | 2002 |
| 5. | Annual Symposium Award of Institute of Chemistry, Chinese Academy of Sciences | 2000 |
| 4. | Excellent Undergraduate Thesis Award, Shandong University | 2000 |
| 3. | Outstanding Student Scholarship, Shandong University (award period 1996-2000) | 2000 |
| 2. | Outstanding Student Award, Shandong University | 1999 |
| 1. | Outstanding Student Award, Shandong University | 1997 |

V. Teaching, Extension, Mentoring, and Advising

A. Courses Taught

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|----|-----------------------------------------------------------------------------|--------------------------------------------------|
| 1. | CHBE 101, Introduction to Chemical and Biomolecular Engineering | |
| | Spring 2012 | enrollments 73 undergrad students |
| | Spring 2013 | enrollments 62 undergrad students |
| | Spring 2014 | enrollments 96 undergrad students |
| 2. | CHBE486/ENCH686, Heterogeneous Catalysis for Energy Conversion Applications | |
| | Fall 2013 | enrollments 7 undergrad and 8 grad students |
| | Fall 2014 | enrollments 23 undergrad and 5 grad students |
| | Fall 2015 | enrollments 26 undergrad and 3 grad students |
| | Fall 2016 | enrollments 16 undergrad and 6 grad students |
| | Fall 2017 | enrollments 29 undergrad and 4 grad students |
| | Fall 2018 | enrollments 20 undergrad and 10 grad students |
| | Fall 2019 | enrollments 11 undergraduate and 3 grad students |
| | Fall 2020 | enrollments 6 undergraduate and 6 grad students |
| 3. | ENCH640, Advanced Chemical Reaction Kinetics | |
| | Spring 2015 | enrollments 18 grad students |
| | Spring 2016 | enrollments 27 grad students |
| | Spring 2018 | enrollments 13 grad students |
| | Spring 2019 | enrollments 24 grad students |
| | Spring 2021 | enrollments 10 grad students |
| 4. | ENCH609, Graduate Seminar | |
| | Fall 2015 | enrollments 20 grad students |
| | Fall 2016 | enrollments 18 grad students |

B. Student Training and Mentoring

9 PhD, 1 MS, 2 undergraduate and 1 high school students are conducting research currently in the group. 7 PhD and 6 MS students have graduated. The graduated PhD students won 33 awards in total, an average of 4.71 awards per PhD student. Liu and her students have mentored 38 undergraduate and 16 high school students on their research projects in the group. Liu hosted 7 visiting professors, and 7 visiting PhD and 2 MS students.

C. Thesis Committee Served

In addition to Liu trainees, she has *served on 9 MS student committees and 40 PhD student committees in UMD campus.*