Exponent®
Engineering & Scientific Consulting

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Professional Profile

Dr. Oh's area of expertise is on material synthesis and catalytic science, with an emphasis on designing efficient catalysts for fuel conversions. She specializes in heterogeneous catalysis especially high-temperature gas-phase reactions and low-temperature liquid-phase reactions.

Dr. Oh is very knowledgeable in material synthesis skills such as chemical formula development, chemical precipitation and co-precipitation, sol-gel, impregnation, electrochemical, high-energy ball-milling etc.

Dr. Oh has extensive expertise in various characterization tools including scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDS), transmission electron microscopy (TEM), powder X-ray diffraction pattern (XRD), Brunauer–Emmett–Teller (BET), temperature programmed desorption (TPD) and chemisorption, thermogravimetric analysis (TGA), X-ray photoelectron spectroscopy (XPS), infrared spectroscopy (IR) and Raman spectroscopy. She is also very well-trained in different chemical analysis skills, including gas chromatography (GC), high-performance liquid chromatography (HPLC) and mass spectroscopy.

Prior to joining Exponent, Dr. Oh was a research assistant in the Department of Chemical and Biomolecular Engineering at the University of Maryland, College Park. She developed novel catalyst systems to reduce the drawbacks in both oxidative coupling of methane (OCM) and direct non-oxidative methane conversion (DNMC) to increase the hydrocarbon yield from methane conversion. She precisely controlled the composition and morphology of hydroxyapatite (HAP) material to improve OCM catalytic performances.

Dr. Oh also established reaction kinetics to explain the effects of these composition and morphology changes on OCM reaction. For DNMC reaction, she has developed a millisecond catalytic wall reactor made of metal oxide catalyst to enable high methane conversion, high C2+ selectivity, and long-term durability. In addition, Dr. Oh has also worked on biomass conversion using zeolite-based catalysts and studied membrane reactor systems to promote fossil fuel conversion efficiency.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of Maryland, College Park, 2018

B.S., Chemical Engineering, University of Maryland, College Park, 2013

Outstanding Graduate Research Assistant Award, University of Maryland, College Park, 2018

Ted Koch Travel Award, Catalysis Club of Philadelphia, 2017

Kokes Award, North American Catalysis Society, 2017

Aspire Scholarship, University of Maryland, College Park, 2013

5-Year Full Scholarship, Malaysia Public Service Department, 2008-2013

Professional Affiliations

American Institute of Chemical Engineers — AIChE

Languages

Mandarin Chinese

Publications

S.C. Oh, E. Schulman, J. Zhang, J. Fan, Y. Pan, J. Meng and D. Liu, “Direct Non-Oxidative Methane Conversion in a Millisecond Catalytic Wall Reactor”, Angewandte Chemie 2019, 131, 7157-7160.

S.C. Oh, J. Xu, D.T. Tran, B. Liu and D. Liu, "Effects of Controlled Crystalline Plane of Hydroxyapatite on Methane Conversion Reaction", ACS Catalysis, 2018, 8, 4493-4507.

S.C. Oh, T. Nguyendo, Y. He, A. Filie, Y. Wu, D. T. Tran, I. C. Lee and D. 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.

S.C. Oh, Y. Lei, H. Chen and D. Liu, "Catalytic Consequences of Cation and Anion Substitutions on the Rate and Mechanism of Oxidative Coupling of Methane over Hydroxyapatite Catalysts", Fuel 2017, 191, 472-485.

S.C. Oh, Y. Wu, H. Chen, D. T. Tran, I. C. Lee, Y. Lei and D. Liu, "Influence of Cation and Anion Substitutions on Oxidative Coupling of Methane over Hydroxyapatite Catalysts", Fuel 2016, 167, 208-217.

B. Liu, S.C. Oh, H. Chen and D. Liu, "The effect of oxidation of ethane to oxygenates on Pt- and Zn-containing LTA zeolites with tunable selectivity", Journal of Energy Chemistry, in press.

Y. Liang, S.C. Oh, X. Wang, H. Glicksman, P. Zavalij, D. Liu, S. Ehrman, "Oxidation-Resistant Micron-Sized Cu-Sn Solid Particles Fabricated by a One-Step and Scalable Method", RSC Advances, 2017, 7, 23468-23477.

B. Liu, H. Chen, S.C. Oh and Y. Fang, “Computer Simulations of the Structure and Properties of Organic Pillared MFI Zeolite Catalyst”, Microporous and Mesoporous Materials 2017, 252, 161-166.

L. Emdadi, D. T. Tran, Y. Wu, S.C. Oh, G. Zhu, I. C. Lee and D. 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 2017, 530, 56-65.

M. Sakbodin, Y. Wu, S.C. Oh, E. D. Wachsman and D. Liu, “Hydrogen-Permeable Tubular Membrane Reactor: Promoting Conversion and Product Selectivity for Non-Oxidative Activation of Methane over an Fe©SiO2 Catalyst”, Angewandte Chemie 2016, 128, 16383-16386.

Y. Wu, Z. Lu, L. Emdadi, S.C. Oh, Y. Lei, H. Chen, D. T. Tran, I. C. Lee and D. 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.

L. Emdadi, S.C. Oh, Y. Wu, S. N. Oliaee, Y. Diao and D. 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.

B. Liu, K. Xie, S.C. Oh, D. Sun, Y. Fang and H. Xi, “Direct synthesis Of Hierarchical USY Zeolite for Retardation of Catalyst Deactivation”, Chemical Engineering Science 2016, 153, 374-381.

B. Liu, Y. Li, S.C. Oh, Y. Fang and H. Xi, “Fabrication of a Hierarchically Structured HKUST-1 by a Mixed-Ligand Approach”, RSC Advances 2016, 6, 61006-61012.

B. Liu, C. Wattanaprayoon, S.C. Oh, L. Emdadi, and D. Liu, "Synthesis of Organic Pillared MFI Zeolite as Bifunctional Acid-Base Catalyst" Chemistry of Materials 2015, 27, 1479–1487.

Y. Wu, L. Emdadi, S.C. Oh, M. Sakbodin and D. 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, 323, 100-111.

Presentations

S.C. Oh, B. Liu and D. Liu, “Synthesis of Organic Pillared MFI Zeolite as Bifunctional Acid-Base Catalyst”, 2017 American Institute of Chemical Engineers (AIChE), Minnesota, USA, 31 October 2017.

S.C. Oh and D. Liu, “Effects of Controlled Crystalline Plane of Hydroxyapatite on Methane Conversion Reactions” 25th North America Catalysis Society (NACS), Denver, Colorado, USA, 4-9 June 2017.

S.C. Oh, T. Nguyendo, Y. He, A. Filie, Y. Wu, and D. Liu, "External Surface and Pore Mouth Catalysis in Hydrolysis of Inulin over Zeolites with Different Micropore Topology and Mesoporosity", 2016 North East Corridor Zeolite Association (NECZA), Pennsylvania, USA, 9 December 2016.

S.C. Oh, Y. Wu, H. Chen, D. Tran, I. Lee, Y. Lei and D. Liu, “Influences of Cation and Anion Substitutions on Oxidative Coupling of Methane over Hydroxyapatite Catalysts”, 2015 North East Corridor Zeolite Association (NECZA), Pennsylvania, USA, 11 December 2015.

S.C. Oh and D. Liu, “Oxidative Coupling of Methane over Hydroxyapatite Catalysts” 24th North America Catalysis Society (NACS), Pittsburgh, Pennsylvania, USA, 14-19 June 2015.

S.C. Oh, Y. Wu, H. Chen, D. Tran, I. Lee, Y. Lei and D. Liu, “Influences of Cation and Anion Substitutions on Oxidative Coupling of Methane over Hydroxyapatite Catalysts”, 2015North East Corridor Zeolite Association (NECZA), Pennsylvania, USA, 11 December 2015.

Book Chapter

S.C. Oh, M. Sakbodin and D. Liu, “Direct Non-Oxidative Methane Conversion in Membrane Reactor” Catalysis, 2019, 31, 127–165