|  |
| --- |
| **Dae Sung Park**Chemical Engineering and Materials Science Email: dspark@umn.eduUniversity of Minnesota Telephone: +1-612-991-4515Minneapolis, MN 55414  |

|  |  |
| --- | --- |
| **EDUCATION** |  |
| Seoul National University* Doctor of Philosophy, School of Chemical and Biological

Engineering* Master of Science, School of Chemical and Biological Engineering
 | 2010-20142008-2010 |
| Ajou University* Bachelor of Science, Department of Chemical Engineering
 | 2001-2008 |

|  |  |
| --- | --- |
| **EXPERIENCE** |  |
| University of Minnesota – Twin Cities (Postdoc Researcher) Center for Sustainable PolymersCatalysis Center for Energy Innovation | 2014. 10-present |
| Institute of Chemical Processes, Seoul National University* Researcher
 | 2014. 09 |

|  |  |
| --- | --- |
| **HONORS** |  |
| Fellowships* Faculty Recommendation Scholarship, Ajou University
* Self-Development Scholarship, Ajou University
* Ajou Scholarship, Ajou University
* Superior Academic Performance, Seoul National University
* Brain Korea 21, Seoul National University
* Lecture & Research Scholarship, Seoul National University
* Brain Korea 21, Seoul National University
 | 1st 20011st 20061st 2007-2nd 20071st 2008-2nd 20081st 2008-2nd 20081st 2010-1st 20122nd 2012 |
| Awards* Best Award of Poster Presentation, Korean Institute of Chemical Engineers (KIChE) Spring Meeting
 | 2011. 04. 29 |

|  |
| --- |
| **TEACHING EXPERIENCES** |
| Teaching assistant* Mar. 2008 ~ Feb. 2009 (School of Chemical & Biological Engineering, SNU)

Experimental Teaching assistants* Sep. 2012 ~ Feb. 2013 (School of Chemical & Biological Engineering, SNU)
 |
| **RESEARCH EXPERIENCE** |  |
| Paul Dauenhauer GroupPostdoc Researcher – (Advisor: Prof. Paul J. Dauenhauer)* Renewable Process for Sustainable Polymer (Isoprene, Butadiene)
* Renewable Chemistry for Sustainable Aromatics (Acylation, Aldol condensation, Diels-Alder cycloaddition)

Project (Fund)* Center for Sustainable Polymers (*US NSF*)
* Producing Renewable Aromatics (*CCEI, US DOE*)

Jongheop Yi GroupGraduate Student Researcher – (Advisor: Prof. Jongheop Yi)* Electron assisted catalysis without thermal reactor for CO2 activation
* Lignocellulose conversion over Pt supported on 3D carbon
* Mesoporous catalysts for hydrogenolysis of glycerol to 1,2-PDO
* Kinetic study of internal mass transfer on 3D catalyst
* Etherification of n-butanol to di-n-butyl ether
* Esterification of ethanol with acetic acid over WOx
* Dehydration of glycerol to acrolein over acid catalysts

 Project * Design of nanostructure-controlled heterogenous catalysts via theoretical/computational research for the energy-saving in petrochemical processes and its experimental validation *(Ministry of Science, ICT and Future Planning)*
* Development of catalytic process for the production of PDO from glycerol *(Ministry of Trade, Industry & Energy)*
* Development of heterogeneous nano-catalysts and processes for converting C2/C4 chemicals to high-valued chemicals by esterification and etherification *(Ministry of Environment)*
 | 2016-Present2014-20162016-Present2014-20162010-20142013-20142010-20142010-2011 |
| Ho-In Lee GroupGraduate Student Researcher – (Advisor: Prof. Ho-In Lee)* Reforming catalysts in molten carbonate fuel cell
* Surface characterization of nickel on spinel structure
 | 2008-2010 |

|  |
| --- |
| **PUBLICATIONS (1st author)** |

1. **D. S. Park**, O. A. Abdelrahman, K. P. Vinter, M. A. Hillmyer, T. M. Reineke, K. Zhang, and P. J. Dauenhauer, “Multi-Functional Cascade Catalysis of Itaconic Acid Hydrodeoxygenation to 3-Methyl-Tetrahydrofuran” *Green Chemistry*, ***submitted***.
2. D. Yun\*, **D. S. Park\***, K. R. Lee, Y. S. Yun, T. Y. Kim, H. Park, H. Lee, and J. Yi, “A New Energy-Saving Catalytic System: CO2 Activation via Metal/Carbon Catalyst” *ChemSusChem*, 10 (2017), 3671-3678. (\*co-first author)
3. O. A. Abdelrahman\*, **D. S. Park\***, K. P. Vinter, C. S. Spanjers, L. Ren, H. J. Cho, D. G. Vlachos, W. Fan, M. Tsapatsis, and P. J. Dauenhauer, “Biomass-derived Butadiene by Dehydra-Decyclization of Tetrahydrofuran” *ACS Sustainable Chem. Eng.*, 5 (2017), 3732-3736. (\*co-first author)
4. O. A. Abdelrahman\*, **D. S. Park\***, K. P. Vinter, C. S. Spanjers, L. Ren, H. J. Cho, K. Zhang, W. Fan, M. Tsapatsis, and P. J. Dauenhauer, “Renewable Isoprene by Sequential Hydrogenation of Itaconic Acid and Dehydra-Decyclization of 3-Methyl-Tetrahydrofuran” *ACS Catalysis*, 7 (2017), 1428-1431. (\*co-first author)
5. **D. S. Park**, K. E. Joseph, M. Koehle, C. Krumm, L. Ren, J. N. Damen, M. H. Shete, H. S. Lee, X. Zuo, B. Lee, W. Fan, D. G. Vlachos, R. F. Lobo, M. Tsapatsis, and P. J. Dauenhauer, “Tunable Oleo-Furan Surfactants by Acylation of Renewable Furans” *ACS Central Science*, 2 (2016), 820-824.
6. Y. S. Yun\*, **D. S. Park\***, and J. Yi, “Effect of nickel on catalytic behaviour of bimetallic Cu-Ni catalyst supported on mesoporous alumina for the hydrogenolysis of glycerol to 1,2-propanediol” *Catal. Sci. & Technol.,* 4 (2014), 3191-3202. (\*co-first author)
7. **D. S. Park**, D. Yun, T. Y. Kim, J. Baek, Y. S. Yun, and J. Yi, “A Mesoporous Carbon-Supported Pt Nanocatalyst for the Conversion of Lignocellulose to Sugar Alcohols” *ChemSusChem*, **6** (2013), 2281–2289.
8. **D. S. Park**, D. Yun, Y. Choi, T. Y. Kim, S. Oh, J.-H. Cho, and J. Yi, “Effect of 3D open-pores on the dehydration of n-butanol to di-n-butylether (DNBE) over a supported heteropolyacid catalyst” *Chemical Engineering Journal*, **228** (2013), 889–895.
9. **D. S. Park**, B. K. Kwak, N. D. Kim, J. R. Park, J.-H. Cho, S. Oh, and J. Yi, “Capturing Coke Precursors in a Pd Lattice: A Carbon-Supported Heteropoly Acid Catalyst for the Dehydration of Glycerol into Acrolein” *ChemCatChem*, **4** (2012), 836–843.
10. **D. S. Park**, Z. Li, H. Devianto, H.-I. Lee, “Characteristics of alkali-resistant Ni/MgAl2O4 catalyst for direct internal reforming molten carbonate fuel cell” *Int. J. Hydrogen Energy*, **35** (2010), 5673-5680.

|  |
| --- |
| **PUBLICATIONS (co-author)** |

1. T. Y. Kim, J. Baek, C. K. Song, Y. S. Yun, **D. S. Park**, W. Kim, J. W. Han and J. Yi, “Gas-phase Dehydration of Vicinal Diols to Epoxides: Dehydrative Epoxidation over a Cs/SiO2 catalyst” *J. Catal.*, **323** (2015), 85-99.
2. D. Yun, T. Y. Kim, **D. S. Park**, Y. S. Yun, J. W. Han and J. Yi, “A Tailored Catalyst for the Sustainable Conversion of Glycerol to Acrolein: Mechanistic Aspect of Sequential Dehydration” *ChemSusChem*, **7** (2014), 2193-2201.
3. Y. Choi, Y. S. Yun, H. Park, **D. S. Park**, D. Yun, and J. Yi, “A facile approach for preparation of tunable acid nanocatalyst with hierarchically mesoporous structure” *Chem. Commun.*, **50** (2014), 7652-7655.
4. Y. Choi, **D. S. Park**, H. J. Yun, J. Baek, D. Yun, and J. Yi, “Mesoporous Siliconiobium Phosphate as a Pure Brønsted Acid Catalyst with Excellent Performance for the Dehydration of Glycerol to Acrolein” *ChemSusChem*, **5** (2012), 2460–2468.
5. J. R. Park, B. K. Kwak, **D. S. Park**, T. Y. Kim, Y. S. Yun, and J. Yi, “Effect of acid type in WO*X* clusters on the esterification of ethanol with acetic acid” *Korean J. Chem. Eng.*, **29** (2012), 1695-1699.
6. N. D. Kim, J. R. Park, **D. S. Park**, B. K. Kwak and J. Yi, “Promoter effect of Pd in CuCr2O4 catalysts on the hydrogenolysis of glycerol to 1,2-propanediol” *Green Chem.*, **14** (2012), 2638–2646.
7. B. K. Kwak, **D. S. Park**, Y. S. Yun, and J. Yi, “Preparation and characterization of nanocrystalline CuAl2O4 spinel catalysts by sol–gel method for the hydrogenolysis of glycerol” *Catalysis Communications*, **24** (2012) 90–95.
8. T. Y. Kim, **D. S. Park**, Y. Choi, J. Baek, J. R. Park and J. Yi, “Preparation and characterization of mesoporous Zr-WOx/SiO2 catalysts for the esterification of 1-butanol with acetic acid” *J. Mater. Chem.*, **22** (2012), 10021–10028.

|  |
| --- |
| **PATENTS (PCT, applied)** |

1. C. Krumm, K. Joseph, **D. S. Park**, M. Mahanthappa, P. J. Dauenhauer, “AROMATIC SURFACTANTS”, PCT/US2016/060775 (November 7, 2016), WO2017079719A1 (May 11, 2017, Publication).
2. **D. S. Park**, C. Krumm, M. Koehle, K. Joseph, D. G. Vlachos, R. F. Lobo, P. J. Dauenhauer, “METHODS OF FORMING AROMATIC CONTAINING COMPOUNDS”, PCT/US2016/060774 (November 7, 2016), WO2017079718A1 (May 11, 2017, Publication).

|  |
| --- |
| **PATENTS (US, applied)** |

1. O. A. Abdelrahman, C. S. Spanjers, **D. S Park**, M. Tsapatsis, L. Ren, P. J. Dauenhauer, “Methods of Forming Dienes From Tetrahydrofuran, Derivatives or Combinations Thereof”, US PATENT, Provisional Application no. 62/410,922 (October 21, 2016).

|  |
| --- |
| **PATENTS (KR, Registered: 7, Applied: 1)** |

1. J. Yi, **D. S. Park**, D. Yun, H. Park, “Metal dispersed on carbon catalyst having open pore structure and preparing method of sorbitol using thereof”, KR PATENT 10-1535123 (2015.07.02).
2. J. Yi, T. Y. Kim, **D. S. Park**, Y. Choi, J. Baek, J. R. Park, “Mixed Oxide Catalysts with Ordered Mesopores, Method of Preparing the Same and Method of Producing Ester Compounds Using the Same”, KR PATENT 10-1402957 (2014.05.27).
3. J. Yi, **D. S. Park**, B. K. Gwak, S. Oh, J.-H. Cho, “Heteropoly acid catalyst supported by silica sphere having open pore and preparing method of acrolein using thereof”, KR PATENT 10-1369924 (2014.02.26).
4. J. Yi, **D. S. Park**, J. R. Park, N. D. Kim, S. Oh, J.-H. Cho, “Copper-chromite catalyst and preparing method of 1,2-propanediol using thereof”, KR PATENT 10-1369921 (2014.02.26).
5. J. Yi, **D. S. Park**, B. K. Gwak, S. Oh, J.-H. Cho, “Catalyst for the dehydration of glycerol to acrolein and preparing method of the same”, KR PATENT10-1322678 (2013.10.22).
6. J. Yi, **D. S. Park**, B. K. Gwak, S. Oh, J.-H. Cho, “Catalyst for the dehydration of glycerol to acrolein and preparing method of the same”, KR PATENT 10-1268461 (2013.05.22).
7. J. Yi, **D. S. Park**, J. R. Park, S. Oh, J.-H. Cho, “Catalyst for the dehydration of glycerol to acrolein and preparing method of the same”, KR PATENT 10-1268459 (2013.05.22).
8. J. Yi, D. Yun, K. R. Lee, **D. S. Park**, “Energy saving catalytic reactor”, KR PATENT (applied number) 10-2016-0073637 (2016. 06. 14).

|  |
| --- |
| **INTERNATIONAL PRESENTATIONS**  |

1. **D. S. Park**, O. Abdelrahman, C. Spanjers, L. Ren, K. Vinter, K. Zhang, M. Tsapatsis, P. J. Dauenhauer, “Sequential Hydrogenation and Dehydration of Renewable Carboxylic Acids to Branched Diol and Diene Monomers”, *25th North American Catalysis Society Meeting*, Denver, CO, USA, June 4-9, 2017.
2. **D. S. Park**, **P. J. Dauenhauer**, K. E. Joseph, C. Krumm, D. Vlachos, and R. F. Lobo, “Reaction Engineering for Modified Furans”, *2016 AIChE*, San Francisco, CA, USA, November 13-18, 2016.
3. **D. S. Park**, D. Yun, Y. S. Yun, H. Park, T. Y. Kim, J. Baek, and J. Yi, “Direct conversion of lignocellulose to sugar alcohols over Pt supported on a new 3D mesoporous carbon”, *247th American Chemical Society National Meeting & Exposition*, Dallas, Texas, USA, March 16-20 (2014)
4. **D. S. Park**, D. Yun, Y. Choi, T. Y. Kim, S. Oh, J.-H. Cho, and J. Yi, “Enhancement of Mass Transport over 3D Open-porous Dandelion-like Catalyst in Liquid-phase Heterogeneous Catalysis”, *9th World Congress of Chemical Engineering*, Seoul, Korea, August 18-23 (2013)
5. **D. S. Park**, Y. S. Yun, D. Yun, S. Oh, Y. A. Shin, and J. Yi, “The hydrogenolysis of glycerol on CuNi bimetallic catalyst supported on mesoporous alumina”, *The 14th Japan-Korea Symposium on Catalysis*, Nagoya, Japan, July 1-3 (2013)
6. **D. S. Park**, B. K. Kwak, J.-H. Cho, S. Oh, and J. Yi, “Stability enhancement of heteropoly acid catalyst supported on carbon for dehydration of glycerol to acrolein”, *15th International Congress on Catalysis*, Munich, Germany, July 1-6 (2012)
7. **D. S. Park**, B. K. Kwak, Y. S. Yun, and J. Yi, “Synthesis of nanocrystalline copper aluminate (CuAl2O4) by sol-gel technique and its application to the to the glycerol hydrogenolysis”, *Asian Crystallization Technology Symposium*, Seoul, Korea, May 23-25 (2012)

|  |
| --- |
| **INTERNATIONAL PRESENTATIONS** (co-author) |

1. 25th North American Catalysis Society Meeting, Denver, Colorado, USA
2. 24th North American Catalysis Society Meeting, Pittsburgh, Pennsylvania, USA
3. 2013 MRS Fall Meeting Program & Exhibit, Boston, Massachusetts, USA.
4. The 14th Japan-Korea Symposium on Catalysis, Nagoya, Japan.
5. 244th American Chemical Society National Meeting & Exposition, Philadelphia, Pennsylvania, USA.
6. 218th ECS meeting, Las Vegas, Nevada, USA.

|  |
| --- |
| **EXPERTIZED TECHNICAL SKILLS** |

1. Synthesis of Nanostructured Materials
2. Colloidal materials: Precipitation, sol-gel, and ion-exchanged method.
3. Supported materials: Impregnation, deposition-precipitation, and direct reduction method.
4. Mesoporous materials: Bottom-up with surfactant and hard template method.
5. Characterization Techniques
6. Expert for catalytic activity test (batch and packed-bed reactor, kinetic experiment, TOS/TON, non-linear curve fitting using Matlab)
7. Materials analysis
* XRD, BET, in-situ FT-IR, AFM, TGA, EDS, SEM, TEM and HR-TEM - operated
* XPS, Raman, ICP, CHNS, TOC – analyzed
1. Chromatography-based instrument (GC-TCD, GC-MS, GC-FID, HPLC)
2. Various temperature-programmed techniques (TPD-mass, TPR, TPO, Chemisorption, and so on)
3. Reactor Design for Chemical Reactions
4. Six years of experience for designing gas-phase reactor system, and continuous liquid flow systems
5. Organic Chemistry Analysis
6. NMR (1H, 13C, Cozy, Dept, and so on)
7. Preparative LC, Flash Chromatography, TLC