**Danim Yun, Ph.D.**

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**Education**

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| **Doctor of Philosophy** | March 2011 – February 2017  School of Chemical and Biological Engineering, Seoul National University  Thesis: Mechanistic Study and Development of a Catalyst for Glycerol Conversion to Acrolein  Advisor: Prof. Jongheop Yi |
| **Bachelor of Science** | March, 2007 – February, 2011  Department of Chemical and Biomolecular Engineering, Sogang University |

**Academic and Research Honors**

1. Participation Prize in the 23th SAMSUNG Humantech Paper Award (February, 2017)
2. Outstanding Oral Presentation Award, The Korean Institute of Chemical Engineers (April, 2014)
3. Research Excellence Award, The Korean Institute of Chemical Engineers (January, 2013)
4. Outstanding Poster Presentation Award, The Korean Institute of Chemical Engineers (April, 2013)

**Scholarships**

1. Academic Excellence Scholarship, Seoul National University (March 1, 2013 - June 30, 2013)
2. National S&T(Science & Technology) Scholarship (March 1, 2007 – June 30, 2009 and March 1, 2010 – December 31, 2010)

**Publication summary**

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| |  |  |  |  | | --- | --- | --- | --- | | Published Papers (International) | | Presenter | | | First author | Co-author | International | Domestic (Korea) | | 8 | 11 | 13 | 21 | |

**Publications**

1. **D. Yun**, Z. Zhang and D. W. Flaherty, “Catalyst and Reactor Design Considerations for Selective Production of Acids by Oxidative Cleavage of Alkenes and Unsaturated Fatty Acids with H2O2”, ***React. Chem. Eng. 2022****, accepted.*
2. **D. Yun**, E. Z. Ayla, D. T. Bregante, D. W. Flaherty, “Reactive Species and Reaction Pathways for the Oxidative Cleavage of 4‑Octene and Oleic Acid with H2O2 over Tungsten Oxide Catalysts”, ***ACS Catalysis, 2021***, 11, 3137-3152.
3. K. R. Lee\*, **D. Yun**\*, D. S. Park, Y. S. Yun, C. K. Song, Y. Kim, J. Park and J. Yi, “In situ Manipulation of the d-band Center in Metals for Catalytic Activity in CO Oxidation”, ***Chemical Communication***, ***2021***, 57, 3403-3406. \*these authors contributed equally
4. **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 2017***, 10, 3671-3678.
5. **D. Yun**, Y. S. Yun, T. Y. Kim, H. Park, J. M. Lee, J. W. Han\*, and J. Yi\*, “Mechanistic Study of Glycerol Dehydration on Brønsted Acidic Amorphous Aluminosilicate”, ***Journal of Catalysis*** **2016**, 341, 33-43.
6. **D. Yun**\*, T. Y. Kim\*, D. S. Park, Y. S. Yun, J. W. Han, J. Yi, “A Tailored Catalyst for the Sustainable Conversion of Glycerol to Acrolein: Mechanistic Aspect of Sequential Dehydration”, **ChemSusChem** **2014**, **7**(8), 2193-2201.
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* 2013**, 6(12), 2281-2289. \*these authors contributed equally
8. **D. Yun**\*, J. Baek\*, Y. Choi, W. Kim, H. J. Lee, and J. Yi, “Promotional effect of Ni on a CrOx catalyst supported on silica in the oxidative dehydrogenation of propane using CO2”, ***ChemCatChem* 2012**, 4(12), 1952-1959.
9. Y. Kim, T. Y. Kim, C. K. Song, K. R. Lee, S. Bae, H. Park, **D. Yun**, Y. S. Yun, I. Nam, J. Park, H. Lee, and J. Yi, “Redox-driven restructuring of lithium molybdenum oxide nanoclusters boosts the selective oxidation of methane”, ***Nano Energy, 2021***, 82, 105704.
10. Y. S. Yun\*, M. Lee\*, J. Sung, **D. Yun**, T. Y. Kim, H. Park, K. R. Lee, C. K. Song, Y. Kim, J. Lee, Y.-J. Seo, I. K. Song, and J. Yi, “Promoting effect of cerium on MoVTeNb mixed oxide catalyst for oxidative dehydrogenation of ethane to ethylene”, ***Applied Catalysis B: Environmetal,* 2018,** 237, 554-562.
11. Y. S. Yun\*, H. Park\*, **D. Yun**, C. K. Song, T. Y. Kim, K. R. Lee, Y. Kim, J. W. Han, and J. Yi, “Tuning the electronic state of metal/graphene catalysts for the control of catalytic activity via N- and B-doping into graphenes”, ***Chemical Communications,* 2018**, 54, 7147-7150.
12. Y. S. Yun, T. Y. Kim, **D. Yun**, K. R. Lee, J. W. Han\*, and J. Yi\*, "Understanding the reaction mechanism of glycerol hydrogenolysis over CuCr2O4 catalyst", ***ChemSusChem*** **2017**, 10, 442-454.
13. T. Y. Kim, C. K. Song, Y. S. Yun, **D. Yun**, J. W. Han, J. Yi, “Active Site Structure of a Lithium Phosphate Catalyst for the Isomerization of 2,3-epoxybutane to 3-buten-2-ol”, ***Molecular Catalysis 2017***, 445, 133-141
14. Y. S. Yun, T. Y. Kim, **D. Yun**, K. R. Lee, J. W. Han, and J. Yi, “Understanding the reaction mechanism of glycerol hydrogenolysis over CuCr2O4 catalyst”, ***ChemSusChem*****2016**, 9, 1-14.
15. Y. S. Yun, K. R. Lee, H. Park, T. Y. Kim, **D. Yun**, J. W. Han, J. Yi, "Rational Design of a Bi-functional Catalyst for the Oxydehydration of Glycerol: A Combined Theoretical and Experimental Study", ***ACS Catalysis*** **2015**, 5, 82-94.
16. Y. Choi, Y. S. Yun, H. Park, D. S. Park, **D. Yun**, and J. Yi, "A Facile Approach for Preparation of Tunable Acid Nano-Catalyst with Hierarchically Mesoporous Structure", ***Chemical Communications*** **2014**, 57(50), 7652-7655.
17. D. S. Park, **D. Yun**, Y. Choi, T. Y. Kim, S. Oh, J.-H. Cho, J. Yi, “Effect of 3D open-pores on the dehydration of n-butanol to di-n-butyl ether (DNBE) over a supported heteropolyacid catalyst”, ***Chemical Engineering Journal***, **2013**, 228, 889-895.
18. Y. Choi, D. S. Park, H. J. Yun, J. Baek, **D. Yun**, and J. Yi, “Mesoporous Siliconiobium Phosphate as a Pure Brønsted Acidic Catalyst with Excellent Performance for the Dehydration of Glycerol to Acrolein”, ***ChemSusChem***, **2012**, 5(12), 2460-2468.
19. J. Baek, H. J. Yun, **D. Yun**, Y. Choi, and J. Yi, “Preparation of highly dispersed chromium oxide catalysts supported on mesoporous silica for the oxidative dehydrogenation of propane using CO2: Insight into the nature of catalytically active chromium sites”, ***ACS Catalysis***, **2012**, 2(9), 1893-1903.

**Patents**

1. J. Yi, Y. Choi, Y. S. Yun, H. Park, **D. Yun**, “Aluminosilicate Nano-spheres having 3-Dimensional Open Pores, Method for Preparing the Same and Method for Producing Acrylic Acid from Glycerol Using the Same”, KR 1013373010000.
2. J. Yi, D. S. Park, **D. Yun**, Y. S. Yun, H. Park, “Carbon Catalyst having Open Pore in Which Dispersed Metal and Method for Producing Sorbitol Using the Same”, KR 1015351230000.
3. J. Yi, **D. Yun**, K. R. Lee, D. S. Park, “A Catalytic Reactor for Energy Saving”, KR 1018276360000.

**International Presentation**

1. **D. Yun**, E. Z. Ayla, D. T. Bregante, D. W. Flaherty, “Mechanistic Investigation for Oxidative Cleavage of Alkenes and Unsaturated Fatty Acids with H2O­2 on Tungsten Oxide Catalysts”, 2021 AIChE, November, 7-12, 2021
2. **D. Yun**, E. Z. Ayla, D. T. Bregante, D. W. Flaherty, “Oxidative Cleavage of Alkenes and Unsaturated Fatty Acids with H2O2 over Tungstates: Mechanisms, Site Requirements, and Support Effects”, 2021 ACS spring meeting, April, 4-9, 2021
3. **D. Yun**, T. Y. Kim, Y. S. Yun, J. M. Lee, J. W. Han, and J. Yi, “Ab initio study of the surface model of amorphous aluminosilicate”, The 15th Korea-Japan Symposium on Catalysis, Busan, Korea, May. 26-28, 2015.
4. **D. Yun**, D. S. Park, T. Y. Kim, S. Oh, Y. A. Shin, J. Yi, ”Preparation of DSS-SO3H Catalyst for Stable Production of Acrolein from Glycerol”, The 14th Japan-Korea Symposium on Catalysis, WINC Aichi, Nagoya, Japan, July 1-3, 2013.

**Technical Skills**

1. **Synthesis of Catalysts**
   1. Nanostructured catalysts (Sol-gel, hydrothermal, hard- and soft-templating method, and so on)
      1. Mesoporous (functionalized) silica, zeolites, and carbon
   2. Supported catalysts (Impregnation, precipitation, direct reduction method and so on)
2. **Characterization Techniques**
   1. Qualification and quantification of chemicals
      1. Gas chromatography (w/ FID, TCD, and MS)
   2. Experiences for handling material analysis instruments
      1. *In situ* Fourier transform infrared spectroscopy (FT-IR)
      2. Temperature programmed techniques w/ TCD and MSD: Oxidation (TPO), reduction (TPR), desorption (TPD)
      3. TEM: JEM-3010 (JEOL), JEM-2100 (JEOL)
      4. XRD: D/max-2500/PC (Rigaku)
      5. *In situ* UV-Visible-NIR spectroscopy
      6. *In situ* Raman (Renishaw)
   3. Utilized instruments
      1. XPS, STEM, EPR, NMR, SEM, TGA, ICP-MS, and EPMA
3. **Computational Chemistry**
   * 1. Periodic DFT calculations using Vienna ab-initio software package (VASP): Modelling of amorphous SiO2, functionalized SiO2, Al2O3-SiO2 surfaces, crystalline metal surfaces, and Transition states for dehydration reactions
4. **Reactor Design and Operation**
   * 1. Fixed-bed flow reactor w/ condensing, trapping, and online sampling
     2. Semi-batch and batch reactor w/ condensing