

CURRICULUM VITAE

Kyung-Won Park, Ph. D.

Professor

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Biography

Kyung-Won Park is an electrochemical energy scientist who performs research in electrochemical energy conversion and storage. In the fields of electrochemical energy conversion and storage, he has studied a wide range of multidisciplinary issues. His past and ongoing research topics cover *relationships between electrochemical energy/system and various materials, effects of structures and dimensions of nano-sized materials on electrochemical energy conversion and storage, synthesis and characterization of highly efficient and durable electrochemistry-related materials, design of novel electrochemical energy systems*, etc.

He has been leading a variety of government and industry-funded research projects, including projects sponsored by National Research Foundation of Korea, Korea Institute of Energy Research, Korea Battery Research Association, Hyundai Motor Company, and many others. With over 20 years of research activities, he has published *more than 200 SCI papers and more than 60 registered domestic and international patents* and has received several awards including *Oronzio de Nora Foundation Prize on Electrochemical Energy Conversion, International Society of Electrochemistry (ISE), 2006* and *Minister Achievement Award, The Ministry of Science and Technology, S. Korea, 2019*. *Especially, he has been currently teaching 15 graduate students and advised 55 graduate students as of 2024.*

Dr. Park received his B.S. in Materials Science and Engineering from Sungkyunkwan University, S. Korea in 1996 and M.S and Ph.D. degrees from Materials Science and Engineering, Gwangju Institute of Science and Technology (GIST), S. Korea in 1998 and 2003, respectively. During his graduate training with *continuous government scholarship*, Park received Excellent Graduate Student Award, GIST, and *Student Research Award of the Battery Division from the Electrochemical Society, US*. He was trained as a postdoctoral scholar at Research Center for Energy Conversion and Storage in Seoul National University in 2003~2004. He worked as a postdoctoral scholar at The Pennsylvania State University, US in 2004~2005.

Keywords: Electrochemical Energy Conversion and Storage; Fuel Cells; Water Electrolysis; Batteries; Electrochemical Energy-related Nanostructure Materials; Electrochemistry-based Applications

Total Citations: 10375, H-Index: 51 (Google Scholar; as of April 2024)

Education & Training

Postdoc. | The Pennsylvania State University, US, 2004~2005

Postdoc. | Research Center for Energy Conversion and Storage, Seoul National University, Korea, 2003~2004

Ph. D. | Materials Science and Engineering, Gwangju Institute of Science and Technology (GIST), Gwangju, S. Korea, 1998~2003 (Thesis: Design and Characterization of Pt-based Nanostructure Electrocatalysts for Methanol Electrooxidation in Direct Methanol Fuel Cells, Excellent Graduate Student Award, Gwangju Institute of Science and Technology, BK21)

M.S. | Materials Science and Engineering, Gwangju Institute of Science and Technology (GIST), Gwangju, S. Korea, 1996~1998 (Thesis title: Selective Area MOVPE for Photonic Device Integration)

B.S. | Materials Science and Engineering, Sungkyunkwan University, Suwon, S. Korea, 1992~1996

Academic Positions & Appointments

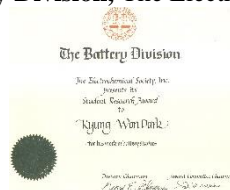
Department Head | Department of Chemical Engineering, Soongsil University, S. Korea, 2021~2023
Professor | Department of Chemical Engineering, Soongsil University, S. Korea, 2016~present
Associate Professor | Department of Chemical Engineering, Soongsil University, S. Korea, 2011~2016
Assistant Professor | Department of Chemical Engineering, Soongsil University, S. Korea, 2005~2011

Honors & Awards

Soongsil Teaching Award, Soongsil University, 2022
Achievement Award, The Korean Society of Industrial and Engineering Chemistry, 2021
Soongsil Research Award, Soongsil University, 2021
Best Soongsil Research Award, Soongsil University, 2020
Minister Achievement Award, The Ministry of Science and Technology, S. Korea, 2019
Achievement Award, The Korean Society of Industrial and Engineering Chemistry, 2019
Best Soongsil Research Award, Soongsil University, 2019
Achievement Award, The Korean Society of Industrial and Engineering Chemistry, 2018
Best Soongsil Research Award, Soongsil University, 2018
Achievement Award, The Korean Society of Industrial and Engineering Chemistry, 2017
Best Soongsil Research Award, Soongsil University, 2017
Selected as “National Outstanding Research Achievement”, The Ministry of Science & Technology, 2017
Achievement Award, The Korean Society of Industrial and Engineering Chemistry, 2016
Best Soongsil Research Award, Soongsil University, 2016
Soongsil Research Award, Soongsil University, 2014
Best Soongsil Research Award, Soongsil University, 2013
Best Soongsil Research Award, Soongsil University, 2012
Best Soongsil Research Award, Soongsil University, 2011
Outstanding Engineering Research Award, Soongsil University, 2008
Oronzio de Nora Foundation Prize on Electrochemical Energy Conversion, International Society of Electrochemistry (ISE), 2006



Student Research Award of the Battery Division, The Electrochemical Society, US, 2003



Excellent Graduate Student Award, Gwangju Institute of Science and Technology, BK21, 2003
Best Presentation Award, Fuel Cell Symposium, The Korean Electrochemical Society, 2003
Best Presentation Award, Fuel Cell Symposium, The Korean Electrochemical Society, 2002
Best Presentation Award, The Korean Chemical Society, 2001
Best Presentation Award, The Korean Electrochemical Society, 2000
Korean Government Scholarship, 1996~2002

Professional Activities

Editorial Board Memberships / Conference Organization

Editorial Board member, Batteries (ISSN: 1226-086X), 2023~present
Editor, Journal of Industrial Engineering and Chemistry (ISSN: 1226-086X), 2014~2019
Editorial Director, The Korean Society of Industrial and Engineering Chemistry, 2014-2019
Editorial Director, The Korean Electrochemical Society, 2010-2011
Academic Director, The Korean Electrochemical Society, 2008-2009

Reviewer of Scientific Journals

Electrochemical Energy Storage and Conversion

Applied Catalysis B: Environmental, Elsevier.
ACS Sustainable Chemistry & Engineering, ACS.
Journal of The Electrochemical Society, ECS.
Energy Storage Materials, Elsevier.
Electrochimica Acta, Elsevier.
International Journal of Hydrogen Energy, Elsevier.
ChemCatChem, Wiley.
Journal of Electroanalytical Chemistry, Elsevier.
Journal of Power Sources, Elsevier.
Chemical Engineering Journal, Elsevier.
Applied Catalysis A: General, Elsevier.
Journal of Energy Chemistry, Elsevier.
Energy & Fuels, ACS.
Nature Communications, Springer.

Nanostructures & Materials

ACS Nano, ACS.
Small, Wiley.
Advanced Functional Materials, Wiley.
Journal of Alloys and Compounds, Elsevier.
Solid State Communications, Elsevier.
Materials Today Chemistry, Elsevier.
ACS Applied Nano Materials, ACS.
ACS Applied Materials & Interfaces, ACS.
Composites Part B, Elsevier.
Applied Surface Science, Elsevier.
Materials Chemistry and Physics, Elsevier.

Service Activities

National / Regional

Reviewer, On-line evaluation of FOUR Brain Korea21, National Research Foundation of Korea, 2024
Reviewer, On-line evaluation of Engineering Research Center (ERC), National Research Foundation of Korea, 2024
Reviewer, On-line evaluation of Mid-level Research Projects, National Research Foundation of Korea, 2023
Reviewer, On-line evaluation of Postdoc Domestic Training Projects, National Research Foundation of Korea, 2023
Reviewer, On-line evaluation of Mid-level Research Projects, National Research Foundation of Korea, 2022

Reviewer, On-line evaluation of Young Researcher Projects, National Research Foundation of Korea, 2022
Reviewer, On-line evaluation of Excellent Young Researcher Projects, National Research Foundation of Korea, 2021
Reviewer, On-line evaluation of Postdoc Oversea Training Projects, National Research Foundation of Korea, 2021
Reviewer, On-line evaluation of Mid-level Research Projects, National Research Foundation of Korea, 2020
Reviewer, On-line evaluation of Postdoc Oversea Training Projects, National Research Foundation of Korea, 2020
Reviewer, On-line evaluation of Basic Research Projects, National Research Foundation of Korea, 2020
Reviewer, On-line evaluation of Young Researcher Projects, National Research Foundation of Korea, 2019
Reviewer, On-line evaluation of Postdoc Oversea Training Projects, National Research Foundation of Korea, 2019
Reviewer, On-line evaluation of Basic Research Projects, National Research Foundation of Korea, 2019
Reviewer, On-line evaluation of Basic Research Projects, National Research Foundation of Korea, 2018
Reviewer, On-line evaluation of Young Researcher Projects, National Research Foundation of Korea, 2015
Reviewer, On-line evaluation of Young Researcher Projects, National Research Foundation of Korea, 2014
Reviewer, On-line evaluation of Mid-level Research Projects, National Research Foundation of Korea, 2014
Review Panelist, Technology development project linked to commercialization, Korea Institute for Advancement of Technology, 2014

University / Departmental

Department Head, Undergraduate & Graduate Programs, Chemical Engineering, Soongsil University, S. Korea, 2021~2023
Center Director, Energy Convergence Center, Soongsil University, S. Korea, 2017~present
Center Director, Center for Ultra-small Five Sense Sensor Convergence Information Technology, Soongsil University, S. Korea, 2014~2016
Committee Member, Institute of Convergence Technology, Soongsil University, S. Korea, 2010~2012
Committee Member, New Undergraduate Student Admissions, Soongsil University, S. Korea, 2009~2011
Program Director, Accreditation Board for Engineering Education of Korea (ABEEK), Chemical Engineering, Soongsil University, S. Korea, 2006~2008

Professional Memberships

Member of International Society of Electrochemistry (ISE)
Member of Materials Research Society (USA)
Member of The Electrochemical Society (USA)
Member of American Chemical Society (ACS)
Member of The Korean Society of Industrial and Engineering Chemistry
Member of The Korean Electrochemical Society

Research Projects

Ongoing Projects

KOLON (2024KOL) | \$72,000 | 04/2024~03/2025

Title: Development of new electrode material post-treatment process for anion-exchange membrane water electrolysis and electrochemical performance evaluation

Source: KOLON Industries Co. Ltd., Korea

Role: Principal Investigator

Description: (Classified)

H2Korea | \$445,500 | 03/2024~02/2025

Title: Regionally linked hydrogen industry innovative talent training project

Source: Ministry of Trade, Industry and Energy of Korea

Role: Principal Investigator

Description: Develop professional and systematic regionally linked curriculum in accordance with regional hydrogen industry development policies and cultivate excellent talent in the hydrogen field tailored to industry and academia

NRF (2022M3H4A3A01083536) | \$517,000 | 07/2022~12/2026

Title: Development of surface stabilization methods for a highly durable porous transport layer in proton exchange membrane water electrolysis

Source: National Research Foundation of Korea

Role: Principal Investigator

Description: The goal of this project is to develop surface stabilization methods for a highly durable porous transport layer in proton exchange membrane water electrolysis.

NRF (2020R1A6A1A03044977) | \$5,670,000 | 06/2020~05/2029

Title: University-focused research institute support project in the field of science and engineering

Source: National Research Foundation of Korea

Role: Co-Investigator

Description: The goal of this project is to establish smart integrated management systems and education platforms to improve industrial and living environments.

Past Projects

NRF (2020R1A2C2010510) | \$495,000 | 03/2020~02/2023

Title: Research on functional interfacial structure for lithium-based high-capacity energy storage

Source: National Research Foundation of Korea

Role: Principal Investigator

Description: The goal of this project is to investigate functional interfacial structures for lithium-based high-capacity energy storage devices.

BE (201930961862) | \$90,000 | 11/2019~11/2021

Title: Development of high-capacity hydrogen-iodine redox flow battery element technology

Source: Boyaz Energy Co., Ltd.

Role: Principal Investigator

Description: (Classified)

NRF (2019M3E6A1104186) | \$1,260,000 | 12/2019~12/2023

Title: Development of high current density (1A/cm² @ 1.7 V) water electrolysis system using lithium-ion exchange membrane

Source: National Research Foundation of Korea

Role: Principal Investigator

Description: The goal of this project is to develop a high current density water electrolysis system using lithium-ion exchange membrane.

BE (2018) | \$45,000 | 09/2017~09/2018

Title: Development of nanostructured catalyst and support for high-efficiency hydrogen generator

Source: Boyaz Energy Co., Ltd.

Role: Principal Investigator

Description: (Classified)

SMBT (2017) | \$37,000 | 09/2017~08/2018

Title: Development of 300W fuel cell using non-precious metal oxygen reduction catalyst

Source: Small and Medium Business Technology Information Promotion Agency

Role: Principal Investigator

Description: The goal of this project is to develop 300W fuel cell using non-precious metal oxygen reduction catalyst.

SMBT (C0503227) | \$32,000 | 06/2017~05/2018

Title: Development of commercialization technology for high-capacity (500mWh/g) metal-air fuel cell

Source: Small and Medium Business Technology Information Promotion Agency

Role: Principal Investigator

Description: The goal of this project is to investigate commercialization technology for high-capacity metal-air fuel cell.

NRF (2017M1A2A2086648) | \$1,469,000 | 12/2017~01/2022

Title: Development of VOCs reduction technology using electrochemical low-temperature oxidation method

Source: National Research Foundation of Korea

Role: Principal Investigator

Description: The goal of this project is to investigate VOCs reduction technology using electrochemical low-temperature oxidation method.

NRF (2016R1A2B2016033) | \$449,000 | 06/2016~05/2019

Title: Development of highly efficient oxygen reduction catalysts using optical analysis and quantum chemical calculations

Source: National Research Foundation of Korea

Role: Principal Investigator

Description: The goal of this project is to investigate highly efficient oxygen reduction catalysts using optical analysis and quantum chemical calculations.

NRF (BK2016) | \$1,490,000 | 03/2016~02/2020

Title: Graduate student training project for beauty-related engineering (Brain Korea Plus)

Source: National Research Foundation of Korea

Role: Principal Investigator

Description: The goal of this project is to train graduate students for beauty-related engineering.

CNU (20153030031670) | \$306,000 | 12/2015~09/2018

Title: High efficiency (over 45%), long life (over 100 cycles) integrated reversible fuel cell

Source: Chonnam National University

Role: Principal Investigator

Description: The goal of this project is to investigate nanostructure catalysts for an integrated reversible fuel cell with high efficiency and long-life cycle.

KIER (20148520120160) | \$135,000 | 12/2014~11/2017

Title: Development of 100 W polymer fuel cell stack with porous gas flow path

Source: Korea Institute of Energy Research

Role: Principal Investigator

Description: The goal of this project is to develop Pt-based catalysts for 100 W polymer fuel cell stack.

(International co-working project with Imperial College London).

KITEP (20138520030800) | \$864,000 | 12/2013~11/2016

Title: Development of precious metal-zero low-temperature fuel cells based on high-performance multidimensional carbon nano fusion structure

Source: Korea Institute of Energy Technology Evaluation and Planning

Role: Principal Investigator

Description: The goal of this project is to develop precious metal-zero low-temperature fuel cells based on high-performance multidimensional carbon nanostructures (*International co-working project with Oxford University*).

NRF (2013R1A1A2012541) | \$135,000 | 06/2013~05/2016

Title: Development of triple-junction nanoelectrode materials for highly reliable electrochemical reactions

Source: National Research Foundation of Korea

Role: Principal Investigator

Description: The goal of this project is to investigate triple-junction nanoelectrode materials for highly reliable electrochemical reactions.

ID (2013) | \$9,000 | 01/2013~03/2013

Title: Open-ended IP R&D project (next-generation battery)

Source: Intellectual Discovery

Role: Principal Investigator

Description: (Classified)

KITEP (2011-0022892) | \$540,000 | 04/2011~03/2012

Title: Graduate student training project for developing new and renewable energy sources

Source: Korea Institute of Industrial Technology Evaluation and Planning

Role: Principal Investigator

Description: The goal of this project is to train graduate students for developing new and renewable energy sources.

KBRA (2010-0022892) | \$108,000 | 03/2011~02/2014

Title: Development of 3.6Ah class cylindrical lithium secondary battery technology

Source: Korea Battery Research Association

Role: Principal Investigator

Description: The goal of this project is to develop 3.6 Ah class cylindrical lithium secondary battery technology.

KETEP (2010) | \$2,201,000 | 09/2010~08/2015

Title: Graduate student training project for high-efficiency energy devices

Source: Korea Institute of Energy Technology Evaluation and Planning

Role: Co-Investigator

Description: The goal of this project is to train graduate students for developing high-efficiency energy devices.

NRF (2010-0022892) | \$162,000 | 09/2010~08/2013

Title: Study of electrochemical energy conversion characteristics of mesoporous nanoparticles using template-free synthesis method

Source: National Research Foundation of Korea

Role: Principal Investigator

Description: The goal of this project is to investigate electrochemical energy conversion characteristics of mesoporous nanoparticles using template-free synthesis method.

NRF (2009-0093051/2011-0030335/2012M1A2A2671689) | \$552,000 | 09/2009~09/2015

Title: New concept fuel cell using nitrogen cycle and Pt-free reduction reaction

Source: National Research Foundation of Korea

Role: Principal Investigator

Description: The goal of this project is to develop new concept fuel cell using nitrogen cycle and Pt-free reduction reaction.

KRF (2010-0065330) | \$97,000 | 05/2009~04/2011

Title: Research on nanostructure control and stability of electrocatalysts using organic-inorganic composite materials

Source: Korea Research Foundation

Role: Principal Investigator

Description: The goal of this project is to train graduate students with nanotechnology in fuel cells.

KIERTPE (200915500050) | \$234,000 | 03/2009~02/2012

Title: Training of human resources with nanotechnology convergence for fuel cells

Source: Korea Institute of Energy Resources Technology Planning and Evaluation

Role: Principal Investigator

Description: The goal of this project is to train graduate students for nanotechnology in fuel cells.

DEM (200917060166) | \$63,000 | 03/2009~02/2011

Title: Research on synthesis and electrochemical properties of ultra-high capacity nano-cathode materials

Source: Daejeong EM Co., Ltd.

Role: Principal Investigator

Description: (Classified)

KIAT (2009) | \$450,000 | 09/2009~02/2013

Title: Graduate student training project for engine design and core control technology in high-performance fuel cell technology

Source: Korea Institute for Advancement of Technology

Role: Co-Investigator

Description: The goal of this project is to train human resources with engine design and core control technology in high-performance fuel cell technology.

RDA (200814890027) | \$90,000 | 04/2008~12/2010

Title: Bio-nano energy conversion system using fibrous biomass

Source: Rural Development Administration

Role: Principal Investigator

Description: The goal of this project is to develop bio-nano energy conversion system using fibrous biomass.

KIST (2008-N-FC08-P-01-3-030) | \$90,000 | 08/2008~07/2011

Title: Development of platinum-based catalyst by nano-shape structure control

Source: Korea Institute of Science and Technology

Role: Principal Investigator

Description: The goal of this project is to develop platinum-based catalysts by nano-shape structure control.

Hyundai Motors (2008-N-FC12-J-01-2-100) | \$225,000 | 10/2008~07/2012

Title: Support-catalyst interaction study to ensure MEA stability for hydrogen fuel cells

Source: Hyundai Motor Company Environmental Technology Research Center

Role: Principal Investigator

Description: (Classified)

Hyundai Motor (200710800174) | \$27,000 | 01/2008~07/2008

Title: Research on improving hydrogen fuel cell efficiency and durability using carbon-free nanoelectrodes

Source: Hyundai Motor Group NGV

Role: Principal Investigator

Description: (Classified)

KRF (200710590134) | \$21,700 | 08/2007~07/2008

Title: Development of platinum-based nanocatalyst structure for high-efficiency energy conversion device using electro-chemical energy

Source: Korea Research Foundation

Role: Principal Investigator

Description: The goal of this project is to develop platinum-based nanocatalyst structures for high-efficiency energy conversion devices using electro-chemical energy.

KRF (200610590133) | \$39,600 | 11/2006~10/2007

Title: Research on hydrogen ion-electron conductivity using electrochromic phenomenon in nano hybrid catalyst structure for hydrogen fuel cells

Source: Korea Research Foundation

Role: Principal Investigator

Description: The goal of this project is to understand hydrogen ion-electron conductivity using electrochromic phenomenon in nano hybrid catalyst structure for hydrogen fuel cells.

Teaching

Graduate Students Advised (as of 2024)

56. Chan-Eui Hong, M.S. Chemical Engineering, Soongsil University, 2022~2024

Thesis: Temperature-Controlled Shape Transformation of PtCo Alloy Catalysts for Enhanced Ammonia Oxidation in Anion-Exchange Membrane Direct Ammonia Fuel Cells

Current Position: To be updated

55. So-Yeon Ahn, M.S. Chemical Engineering, Soongsil University, 2022~2024

Thesis: F-doped Co-free $\text{LiNi}_x\text{Mn}_{1-x}\text{O}_2$ Cathodes for Ameliorating Electrochemical Performance of Li-ion Batteries

Current Position: Samsung SDI R&D

54. Yoonhi Gu, M.S. Chemical Engineering, Soongsil University, 2022~2024

Thesis: NiFe layered double hydroxides synthesized based on solvent properties for enhanced oxygen evolution reaction in anion exchange membrane water electrolysis

Current Position: To be updated

53. Da-Mi Lim, M.S. Chemical Engineering, Soongsil University, 2022~2024

Thesis: 3D-stacked electrospun Fe-doped NiCo_2O_4 nanofibers as integrated electrodes for oxygen evolution reaction

Current Position: Hyundai Motors R&D

52. Seon-Ha Park, M.S. Chemical Engineering, Soongsil University, 2022~2024

Thesis: Tri-doped mesoporous carbon nanostructures prepared via template method for enhanced oxygen reduction reaction

Current Position: Hyundai Steel R&D

51. Won-Chan Kim, M.S. Chemical Engineering, Soongsil University, 2022~2024

Thesis: Ameliorated Electrochemical Performance of Fe-doped Li_2MnO_3 Cathodes for Li-ion Batteries

Current Position: Samsung SDI R&D

50. Jeong-Hyeon Byeon, M.S. Chemical Engineering, Soongsil University, 2021~2023

Thesis: Kirkendall effect-driven formation of hollow PtNi alloy nanostructures with enhanced oxygen reduction reaction performance

Current Position: LG Chemical R&D

49. Yu-Yeon Park, M.S. Chemical Engineering, Soongsil University, 2021~2023

Thesis: VN/rGO composite structure as an interlayer with dual lithium polysulfide adsorption effect for lithium-sulfur batteries

Current Position: LG Chemical R&D

48. Min-Ha Kim, M.S. Chemical Engineering, Soongsil University, 2021~2023

Thesis: Fe-doped Co₃O₄ nanostructures prepared via hard-template method and used for the oxygen evolution reaction in alkaline media

Current Position: Hyundai Steel R&D

47. Seong-Nam Lee, M.S. Chemical Engineering, Soongsil University, 2021~2023

Thesis: Enhanced cycling performance of Fe-doped LiMn₂O₄ truncated octahedral cathodes for Li-ion batteries

Current Position: LG Chemical R&D

46. Hak Joo Lee, M.S. Chemical Engineering, Soongsil University, 2020~2022

Thesis: Mesoporous Spinel Ir-doped NiCo₂O₄ Nanostructure as an Efficient Catalyst for Oxygen Evolution Reaction

Current Position: Hyundai Motors R&D

45. Woo-Jun Lee, M.S. Chemical Engineering, Soongsil University, 2020~2022

Thesis: Enhanced oxygen reduction reaction performance of Pt catalysts on Nb₂O₅ nanoparticles decorated carbon nanostructures

Current Position: Hyundai Motors R&D

44. Jae-Hoon Shin, M.S. Chemical Engineering, Soongsil University, 2020~2022

Thesis: Porous activated carbons derived from coffee waste for use as functional separators in lithium-sulfur batteries

Current Position: Ecopro BM R&D

43. Sung-Beom Kim, M.S. Chemical Engineering, Soongsil University, 2020~2022

Thesis: Li-ion diffusivity and electrochemical performance of high-nickel cathode material doped with fluoride ions

Current Position: SK ON R&D

42. Sang-Hyun Moon, Ph.D. Chemical Engineering, Soongsil University, 2017~2022

Thesis: A Study on the Optimization of functional separator and electrode structure for high stability lithium sulfur battery

Current Position: Korea Research Institute of Chemical Technology

41. Jin-Hyeok Choi, M.S. Chemical Engineering, Soongsil University, 2019~2021

Thesis: Enhanced electrochemical performance of MoS₂/graphite nanosheet nanocomposites

Current Position: Ecopro BM R&D

40. Seul-Gi Lee, M.S. Chemical Engineering, Soongsil University, 2019~2021

Thesis: Effect of Sb-doped SnO₂ nanostructures on electrocatalytic performance of a Pt catalyst for methanol oxidation reaction

Current Position: Ecopro BM R&D

39. Yo-Seob Kim, M.S. Chemical Engineering, Soongsil University, 2018~2020

Thesis: Ni₂P/graphitic carbon nanostructure electrode with superior electrochemical performance

Current Position: Samsung SDI R&D

38. Hyeona Kim, M.S. Chemical Engineering, Soongsil University, 2018~2020

Thesis: Facile one-pot synthesis of Ge/TiO₂ nanocomposite materials with improved electrochemical performance

Current Position: SK ON R&D

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- 37. Min-Cheol Kim, Ph.D.** Chemical Engineering, Soongsil University, 2014~2019
Thesis: A study on the optimization of cathode catalyst and gas diffusion layer structure for high performance lithium air batteries
Current Position: Dongsung Chemical R&D
- 36. Suk-Hui Kwon, M.S.** Chemical Engineering, Soongsil University, 2017~2019
Thesis: Synergistically enhanced electrocatalytic stability of Pt catalyst supported by doped porous carbon nanostructure
Current Position: Hyundai Motors R&D
- 35. Ji-Eun Lee, M.S.** Chemical Engineering, Soongsil University, 2017~2019
Thesis: Role of polyvinylpyrrolidone in electrochemical performance of Li₂MnO₃ cathode for lithium-ion batteries
Current Position: Hyundai Mobis R&D
- 34. Yeon-Kyung Shin, M.S.** Chemical Engineering, Soongsil University, 2017~2019
Thesis: Pore-controlled polymer membrane with Mn(II) ion trapping effect for high-rate performance LiMn₂O₄ cathode
Current Position: Samsung SDI R&D
- 33. Sojeong Cho, M.S.** Chemical Engineering, Soongsil University, 2017~2019
Thesis: F-doped Li_{1.15}Ni_{0.275}Ru_{0.575}O₂ cathode materials with long cycle life and improved rate performance
Current Position: LG Chemical R&D
- 32. Eun-Soo Kim, M.S.** Chemical Engineering, Soongsil University, 2017~2019
Thesis: Surface modified and size-controlled octahedral Cu₂O nanostructured electrodes for lithium-ion batteries
Current Position: SK Hynix
- 31. Ji-Eun Won, M.S.** Chemical Engineering, Soongsil University, 2016~2018
Thesis: PtIr/Ti₄O₇ as a bifunctional electrocatalyst for improved oxygen reduction and oxygen evolution reactions
Current Position: To be updated
- 30. Kyeng-Bae Ma, M.S.** Chemical Engineering, Soongsil University, 2016~2018
Thesis: Direct ethanol fuel cells with superior methanol-tolerant non-precious metal cathode catalysts for oxygen reduction reaction
Current Position: KT&G R&D
- 29. Do-Hyoung Kim, M.S.** Chemical Engineering, Soongsil University, 2016~2018
Thesis: The role of arginine as nitrogen doping and carbon source for enhanced oxygen reduction reaction
Current Position: Samsung Electronics
- 28. Da-Hee Kwak, Ph.D.** Chemical Engineering, Soongsil University, 2013~2018
Thesis: Study on Doped Mesoporous Carbon Nanostructures as Non-Precious Metal Catalysts for Oxygen Reduction Reaction
Award: Samsung Human Tech Paper Award, Samsung Electronics, 2015
Current Position: Hyundai Motors R&D
- 27. Jin-Young Park, M.S.** Chemical Engineering, Soongsil University, 2016~2018
Thesis: Organic ligand-free PtIr alloy nanostructures for superior oxygen reduction and evolution reactions
Current Position: Doosan DMI R&D
- 26. Hyun-Suk Park, M.S.** Chemical Engineering, Soongsil University, 2015~2017
Thesis: Sulfur-doped porphyrinic carbon nanostructures synthesized by amorphous MoS₂ for oxygen reduction reaction in an acid medium
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Current Position: Boyaz Energy R&D

25. Sang-Beom Han, Ph.D. Chemical Engineering, Soongsil University, 2010~2017

Thesis: The Chemically Regenerative redox fuel cells via liquid-catalyst without precious metals

Award: Seoul Fellowship, Seoul Scholarship Foundation, 2009

Current Position: CTO, Boyaz Energy

24. Hui-Seon Choe, M.S. Chemical Engineering, Soongsil University, 2015~2017

Thesis: In-situ synthesis of Ge/Ti4O7 composite with enhanced electrochemical properties

Current Position: Samsung SDI R&D

23. In-Ae Choi, M.S. Chemical Engineering, Soongsil University, 2015~2017

Thesis: Doped porous carbon nanostructures as non-precious metal catalysts prepared by amino acid glycine for oxygen reduction reaction

Current Position: Samsung SDI R&D

22. Gyu-Ho Lee, M.S. Chemical Engineering, Soongsil University, 2015~2017

Thesis: Synthesis of Ge/C composites as anodes using glucose as a reductant and carbon source for lithium-ion batteries

Current Position: Ottogi Co. R&D

21. Si-Jin Kim, Ph.D. Chemical Engineering, Soongsil University, 2011~2017

Thesis: Synthesis of high-capacity electrode materials (Li2MnO3 based, Si based) for Li-ion batteries and their electrochemical performance

Award: Material Popularization Contest Award, Materials Research Institute, S. Korea, 2016

Current Position: National Research Foundation of Korea

20. Jin-Yeon Lee, M.S. Chemical Engineering, Soongsil University, 2014~2016

Thesis: Porous Cu-rich@Cu3Pt alloy catalyst with a low Pt loading for enhanced electrocatalytic reactions

Current Position: Korea Institute of Industrial Technology

19. Seul Lee, M.S. Chemical Engineering, Soongsil University, 2014~2016

Thesis: Bimodal porous iron-nitrogen doped highly crystalline carbon nanostructure as a cathode catalyst for oxygen reduction reaction in an acid medium

Current Position: Samsung Electronics

18. Da-Mi Kim, M.S. Chemical Engineering, Soongsil University, 2014~2016

Thesis: In-Situ Synthesis and Characterization of Ge Embedded Electrospun Carbon Nanostructures as High Performance Anode Material for Lithium-Ion Batteries

Current Position: Samsung Electronics

17. Eui-Tak Hwang, M.S. Chemical Engineering, Soongsil University, 2013~2015

Thesis: Synthesis of Pt-Rich@Pt-Ni alloy core-shell nanoparticles using halides

Current Position: FITI Testing & Research Institute

16. Han-Chul Park, M.S. Chemical Engineering, Soongsil University, 2013~2015

Thesis: Tungsten nitride nanoplates as an anode material for lithium ion batteries

Current Position: Youl Chon Chemical Co. R&D

15. Young-Woo Lee, Ph.D. Chemical Engineering, Soongsil University, 2009~2014

Thesis: Synthesis of Shape- and Structure-Controlled Pt-based Nanocatalysts for Electrochemical Catalytic Reactions

Award: H. H. Dow Memorial Student Achievement Award, The Electrochemical Society, US, 2013

Current Position: Professor, Soonchunhyang University, S. Korea

14. Bo-Mi Hwang, M.S. Chemical Engineering, Soongsil University, 2012~2014

Thesis: Truncated octahedral LiMn2O4 cathode for high-performance lithium-ion batteries

Current Position: EMW Co. R&D

13. Kyung-Hoon Lee, M.S. Chemical Engineering, Soongsil University, 2012~2014
Thesis: Single-crystalline mesoporous Mo₂N nanobelts with an enhanced electrocatalytic activity for oxygen reduction reaction
Current Position: Samsun Electronics

12. Ah-Reum Park, M.S. Chemical Engineering, Soongsil University, 2012~2014
Thesis: Enhanced electrocatalytic activity and stability of PdCo@Pt core-shell nanoparticles for oxygen reduction reaction
Current Position: HnPower

11. Je-Suk Moon, M.S. Chemical Engineering, Soongsil University, 2012~2014
Thesis: Iron-nitrogen-doped mesoporous tungsten carbide nanostructures as an oxygen reduction electrocatalyst
Award: Samsung Human Tech Paper Award, Samsung Electronics, 2013
Current Position: Samsun Electronics

10. Biao Han, M.S. Chemical Engineering, Soongsil University, 2011~2013
Thesis: Single crystalline rutile TiO₂-NWs for improved lithium-ion intercalation properties
Current Position: SoulBrain Co. Ltd.

9. Seong-Bae Kim, Ph.D. Chemical Engineering, Soongsil University, 2009~2013
Thesis: Development of multi-component cathode materials for lithium secondary batteries
Current Position: LG Chemical

8. Do-Young Kim, M.S. Chemical Engineering, Soongsil University, 2010~2012
Thesis: TiO₂@C core-shell nanostructure electrodes for improved electrochemical properties in alkaline solution
Current Position: NOROO Holdings R&D

7. A-Ra Ko, M.S. Chemical Engineering, Soongsil University, 2009~2011
Thesis: Synergy Effect of Nanostructure Electrodes Supported by Tungsten Carbide and Oxide for Methanol Electrooxidation
Current Position: To be updated

6. Hyun-Su Kim, M.S. Chemical Engineering, Soongsil University, 2009~2011
Thesis: Controlled nanostructure electrodes for dye-sensitized solar cells
Current Position: To be updated

5. Jong-Min Lee, M.S. Chemical Engineering, Soongsil University, 2008~2010
Thesis: Core-Shell Nanostructure Electrodes for Improved Electrocatalytic Properties in Methanol Electrooxidation
Current Position: LG Chemical

4. Jy-Yeon Kim, M.S. Chemical Engineering, Soongsil University, 2008~2010
Thesis: Improved Tri-iodide Reduction Reaction of Co-TMPP/C as a Non-Pt Counter Electrode in Dye-Sensitized Solar Cells
Current Position: PICOSTECH Co. Ltd.

3. Jae-Kyung Oh, M.S. Chemical Engineering, Soongsil University, 2008~2010
Thesis: TiO₂ Nano branch electrodes synthesized by seeding method for dye-sensitized solar cells
Current Position: Hyundai Motors R&D

2. Jin-Kyu Lee, M.S. Chemical Engineering, Soongsil University, 2007~2009
Thesis: Synthesis of TiO₂ nanoparticles via hydrothermal process for dye-sensitized solar cells
Current Position: SGE Co. Ltd.

1. You-Jung Song, M.S. Chemical Engineering, Soongsil University, 2007~2009
Thesis: Synthesis of Pd Dendritic Nanowires by Electrochemical Deposition
Current Position: Hyundai Motors R&D

Current Graduate Students (as of 2024)

1. Deok-Hye Park, Ph.D. Student, Chemical Engineering, Soongsil University, 2019~present
Research Interest: Electrochemical Water Electrolysis

2. Ji-Hwan Kim, Ph.D. Student, Chemical Engineering, Soongsil University, 2020~present
Research Interest: Electrolytes for All-Solid-State Batteries

3. Jae-Sung Jang, Ph.D. Student, Chemical Engineering, Soongsil University, 2020~present
Research Interest: Li-Air Batteries

4. Dong-Geon Seo, M.S. Student, Chemical Engineering, Soongsil University, 2023~present
Research Interest: Pt-based Catalysts for Proton Exchange Membrane Fuel Cells and Water Electrolysis

5. Gang-In Lee, M.S. Student, Chemical Engineering, Soongsil University, 2023~present
Research Interest: Cathode for Li-S Batteries

6. Jong-Won Lim, M.S. Student, Chemical Engineering, Soongsil University, 2023~present
Research Interest: Cathode for Li-ion Batteries

7. Jae-Ik Han, M.S. Student, Chemical Engineering, Soongsil University, 2023~present
Research Interest: Anode Catalysts for Proton Exchange Water Electrolysis

8. Ji-Min Hong, M.S. Student, Chemical Engineering, Soongsil University, 2023~present
Research Interest: Oxide Electrolytes for All-Solid-State Batteries

9. Ji-Min Hong, M.S. Student, Chemical Engineering, Soongsil University, 2023~present
Research Interest: Oxide Electrolytes for All-Solid-State Batteries

10. Eo-Jin Kim, M.S. Student, Chemical Engineering, Soongsil University, 2024~present
Research Interest: Proton Exchange Membrane Water Electrolysis

11. Hyun-Moon Jo, M.S. Student, Chemical Engineering, Soongsil University, 2024~present
Research Interest: Alkaline Exchange Membrane Water Electrolysis

12. Min-Jae Kim, M.S. Student, Chemical Engineering, Soongsil University, 2024~present
Research Interest: Oxide Electrolytes for All-Solid-State Batteries

13. Se-Yeon Jang, M.S. Student, Chemical Engineering, Soongsil University, 2024~present
Research Interest: Cathode for Li-ion Batteries

14. Ji-Woong Yun, M.S. Student, Chemical Engineering, Soongsil University, 2024~present
Research Interest: Proton Exchange Membrane Water Electrolysis

15. Chae-Won Cho, M.S. Student, Chemical Engineering, Soongsil University, 2024~present
Research Interest: Proton Exchange Membrane Water Electrolysis

Courses Taught

Instructor, **Industry/Academia-Linked Hydrogen Energy**, Graduate Course, Soongsil University, 2024
 Instructor, **Hydrogen Production: Electrochemistry**, Graduate Course, Soongsil University, 2024
 Instructor, **Electrochemical Energy Engineering**, Undergrad Elective, Soongsil University, 2024
 Instructor, **Advanced Battery Engineering**, Undergrad Elective, Soongsil University, 2023 / 2024
 Instructor, **Nanomaterials Engineering**, Undergrad Elective, Soongsil University, 2022 / 2023
 Instructor, **Hydrogen Energy Applications**, Graduate Course, Soongsil University, 2022
 Instructor, **Understanding Scientific Papers**, Graduate Course, Soongsil University, 2022
 Instructor, **Electrochemical Engineering**, Undergrad Elective, Soongsil University, 2021 / 2022
 Instructor, **Nano Application Engineering**, Graduate Course, Soongsil University, 2021
 Instructor, **Instrument analysis**, Undergrad Elective, Soongsil University, 2020~2024
 Instructor, **Energy Device Engineering**, Undergrad Elective, Soongsil University, 2020 / 2022
 Instructor, **Energy Materials Science**, Graduate Course, Soongsil University, 2017
 Instructor, **Chemical Engineering Thermodynamics II**, Undergrad Elective, Soongsil University, 2014~2018 / 2020
 Instructor, **Engineering Design**, Undergrad Elective, Soongsil University, 2013~2015
 Instructor, **Introduction to Electrochemical Engineering**, Graduate Course, Soongsil University, 2013
 Instructor, **Energy Materials**, Undergrad Elective, Soongsil University, 2013 / 2017
 Instructor, **Special Topics on Energy Conversion**, Graduate Course, Soongsil University, 2013
 Instructor, **Special Topics on Secondary Batteries**, Graduate Course, Soongsil University, 2012
 Instructor, **Nano Device Engineering**, Undergrad Elective, Soongsil University, 2009~2011 / 2018 / 2022
 Instructor, **Chemical Engineering Thermodynamics I**, Core Engineering Course, Soongsil University, 2008 / 2009 / 2014~2018 / 2020 / 2021
 Instructor, **Introduction to Engineering Design**, Undergrad Elective, Soongsil University, 2007 / 2012
 Instructor, **Energy Engineering**, Graduate Course, Soongsil University, 2007
 Instructor, **Inorganic Chemistry**, Undergrad Elective, Soongsil University, 2007
 Instructor, **Physical Chemistry**, Core Engineering Course, Soongsil University, 2006
 Instructor, **Materials Science**, Undergrad Elective, Soongsil University, 2006~2008 / 2010 / 2013 / 2014
 Instructor, **Introduction to Nanotechnology**, Graduate Course, Soongsil University, 2005
 Instructor, **Engineering Mathematics**, Undergrad Elective, Soongsil University, 2005~2007

Publications

Representative SCI Papers (*Corresponding author)

[All-Solid-State Batteries] "Heterogeneous Double-Layered Hybrid Solid Electrolyte with a Concentration-Gradient Structure for High-Performance All-Solid-State Li Batteries", Ji-Hwan Kim, Ji-Won Sun, Jae-Sung Jang, Deok-Hye Park, So-Yeon Ahn, Won-Chan Kim, Kyoungmin Min*, **Kyung-Won Park***, *Energy Storage Materials* 64 (2024) 103080

[High-Capacity Cathode for Li-ion Batteries] "Ameliorated Electrochemical Performance of Fe-doped Li₂MnO₃ Cathodes for Li-ion Batteries", Won-Chan Kim, Ji-Hwan Kim, Juo Kim, Deok-Hye Park, Yu-Yeon Park, Jae-Sung Jang, So-Yeon Ahn, Kyoungmin Min*, Kyung-Won Park*, *Journal of Materials Chemistry A* 12 (2024) 1135-1144

[Advanced Water Electrolysis for Hydrogen Production] "Lithium-ion exchange membrane water electrolysis using a cationic polymer-modified polyethersulfone membrane", Yong-Soo Lee, Deok-Hye Park, Seon-Ha Park, Yun-Hui Gu, Da-Mi Lim, Sang-Beom Han, **Kyung-Won Park***, *ACS Sustainable Chemistry & Engineering*, 11(27) (2023) 10183-10190

[Andoe Catalyst for Water Electrolysis] “Spherical nickel doped cobalt phosphide as an anode catalyst for oxygen evolution reaction in alkaline media: From catalysis to system”, Deok-Hye Park, Min-Ha Kim, Myungjae Kim, Jeong-Hyeon Byeon, Jae-Sung Jang, Ji-Hwan Kim, Da-Mi Lim, Seon-Ha Park, Yun-Hui Gu, Jiwoong Kim, **Kyung-Won Park***, *Applied Catalysis B*, 327 (2023) 122444

[Li-Air Batteries] “Nature Inspired Cathodes using High-density Carbon Papers with Eddy Current Effect for High-rate Performance Li-air Batteries”, Min-Cheol Kim, Jin-Young So, Sang-Hyun Moon, Sang-Beom Han, Sojeong Choi, Eun-Soo Kim, Yeon-Kyung Shin, Ji-Eun Lee, Da-Hee Kwak, Chanho Lee, Won-Gyu Bae, and **Kyung-Won Park***, *Journal of Materials Chemistry A*, 6 (2018) 9550-9560

[Fuel Cells using Redox/Regeneration Reactions] “High-Performance Chemically Regenerative Redox Fuel Cells using a NO₃-/NO Regeneration Reaction”, Sang-Beom Han, Da-Hee Kwak, Hyun Suk Park, In-Ae Choi, Jin-Young Park, Si-Jin Kim, Min-Cheol Kim, Seongho Hong, and **Kyung-Won Park***, *Angewandte Chemie International Edition*, 56 (2017) 2893-2897.

[Non-Pt Catalyst for Electrochemical Oxygen Reduction] “Fe/N/S-doped mesoporous carbon nanostructures as electrocatalyst for oxygen reduction reaction in acid medium”, Da-Hee Kwak, Sang-Beom Han, Y.-W. Lee, Hyun-Suk Park, In-Ae Choi, Min-Cheol Kim, Si-Jin Kim, Do-Hyoung Kim, Jung Inn Sohn, **Kyung-Won Park***, *Applied Catalysis B*, 203 (2017) 889-898.

[Nanostructured Anode for Li-ion Batteries] “3D flexible Si based-composite(Si@Si₃N₄)/CNF electrode with enhanced cyclability and high rate capability for lithium-ion batteries”, Si-Jin Kim, Min-Cheol Kim, Sang-Beom Han, Gyu-Ho Lee, Hui-Seon Choe, Da-Hee Kwak, Sun-Yong Choi, Byung-Goo Son, Myoung-Sun Shin, **Kyung-Won Park***, *Nano Energy*, 27 (2016) 545-553.

[Fuel Cells using Redox Couple] “Chemically regenerative redox fuel cells using iron redox couple as a liquid catalyst with co-catalysts”, Sang-Beom Han, Da-Hee Kwak, Hyun Suk Park, In-Ae Choi, Jin-Young Park, Kyeng-Bae Ma, Ji-Eun Won, Do-Hyoung Kim, Si-Jin Kim, Min-Cheol Kim, and **Kyung-Won Park***, *ACS Catalysis*, 6 (2016) 5302-5306.

Total Journal Articles (Citations 10585, H-index 52, as of August 2024)

1. "F-doped Co-free Li_{Nix}Mn_{1-x}O₂ (0.7≤x≤0.9) Cathodes for Ameliorating Electrochemical Performance of Li-ion Batteries", So-Yeon Ahn, Deok-Hye Park, Ji-Hwan Kim, Jae-Sung Jang, Won-Chan Kim, Gang-In Lee, Jong-Won Lim, Ji-Min Hong, **Kyung-Won Park***, *Materials Today Energy* 41 (2024) 101520
 2. "Ameliorated Electrochemical Performance of Fe-doped Li₂MnO₃ Cathodes for Li-ion Batteries", Won-Chan Kim, Ji-Hwan Kim, Joo Kim, Deok-Hye Park, Yu-Yeon Park, Jae-Sung Jang, So-Yeon Ahn, Kyoungmin Min*, **Kyung-Won Park***, *Journal of Materials Chemistry A* 12 (2024) 1135-1144
 3. "NiFe layered double hydroxides synthesized based on solvent properties for enhanced oxygen evolution reaction in anion exchange membrane water electrolysis", Yoonhi Gu, Deok-Hye Park, Min-Ha Kim, Jeong-Hyeon Byeon, Da-Mi Lim, Seon-Ha Park, Ji-Hwan Kim, Jae-Sung Jang, **Kyung-Won Park***, *Chemical Engineering Journal*, 480 (2024) 147789
 4. "Tri-doped mesoporous carbon nanostructures prepared via template method for enhanced oxygen reduction reaction", Seon-Ha Park, Deok-Hye Park, Jeong-Hyeon Byeon, Min-Ha Kim, Yoonhi Gu, Da-Mi Lim, Ji-Hwan Kim, Jae-Sung Jang, Chan-Eui Hong, Dong-Geon Seo, Jae-Ik Han, **Kyung-Won Park***, *Carbon* 218 (2024) 118666
 5. "Heterogeneous Double-Layered Hybrid Solid Electrolyte with a Concentration-Gradient Structure for High-Performance All-Solid-State Li Batteries", Ji-Hwan Kim, Ji-Won Sun, Jae-Sung Jang, Deok-Hye Park, So-Yeon Ahn, Won-Chan Kim, Kyoungmin Min*, **Kyung-Won Park***, *Energy*
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Storage Materials 64 (2024) 103080

6. "VN/rGO composite structure as an interlayer with dual lithium polysulfide adsorption effect for lithium-sulfur batteries", Yu-Yeon Park, Sang-Hyun Moon, Deok-Hye Park, Jae-Hoon Shin, Ji-Hwan Kim, Jae-Sung Jang, Sung-Beom Kim, Sung-Nam Lee, **Kyung-Won Park***, *Journal of Alloys and Compounds* 960 (2023) 170812
 7. "Lithium-ion exchange membrane water electrolysis using a cationic polymer-modified polyethersulfone membrane", Yong-Soo Lee, Deok-Hye Park, Seon-Ha Park, Yun-Hui Gu, Da-Mi Lim, Sang-Beom Han, **Kyung-Won Park***, *ACS Sustainable Chemistry & Engineering*, 11(27) (2023) 10183-10190
 8. "Fe-doped Co₃O₄ nanostructures prepared via hard-template method and used for the oxygen evolution reaction in alkaline media", Min-Ha Kim, Deok-hye Park, Jeong-Hyeon Byeon, Da-Mi Lim, Yun-Hui Gu, Seon-Ha Park, **Kyung-Won Park***, *Journal of Industrial Engineering and Chemistry*, 123 (2023) 436-446
 9. "Spherical nickel doped cobalt phosphide as an anode catalyst for oxygen evolution reaction in alkaline media: From catalysis to system", Deok-Hye Park, Min-Ha Kim, Myungjae Kim, Jeong-Hyeon Byeon, Jae-Sung Jang, Ji-Hwan Kim, Da-Mi Lim, Seon-Ha Park, Yun-Hui Gu, Jiwoong Kim*, **Kyung-Won Park***, *Applied Catalysis B*, 327 (2023) 122444
 10. "Enhanced oxygen reduction reaction performance of Pt catalysts on Nb₂O₅ nanoparticles decorated carbon nanostructures", Woo-Jun Lee, Deok-Hye Park, Hak-Joo Lee, Jeong-Hyeon Byeon, Min-Ha Kim, and **Kyung-Won Park***, *Materials Science and Engineering B* 289 (2023) 116253
 11. "Kirkendall effect-driven formation of hollow PtNi alloy nanostructures with enhanced oxygen reduction reaction performance", Jeong-Hyeon Byeon, Deok-Hye Park, Woo-Jun Lee, Min-Ha Kim, Hak-Joo Lee, **Kyung-Won Park***, *Journal of Power Sources*, 556 (2023) 232483
 12. "Solvothermal synthesis-driven quaternary Ni-rich cathode for stability-improved Li-ion batteries", Sung-Beom Kim, So-Yeon Ahn, Ji-Hwan Kim, Jae-Sung Jang, **Kyung-Won Park***, *Electrochemistry Communications*, 146 (2023) 107426
 13. "Development of a lithium-air battery with an improved redox mediator applicable to gel polymer electrolytes", Jae-Sung Jang, Min-Cheol Kim, Ji-Hwan Kim, Deok-Hye Park, Seong-Nam Lee, Yu-Yeon Park, Min-Ha Kim, Jeong-Hyeon Byeon, Jung, Inn Sohn, **Kyung-Won Park***, *Journal of Industrial Engineering Chemistry* 117 (2023) 220-226
 14. "Porous activated carbons derived from coffee waste for use as functional separators in lithium-sulfur batteries", Jae-Hoon Shin, Yu-Yeon Park, Sang-Hyun Moon, Ji-Hwan Kim, Jae-Sung Jang, Sung-Beom Kim, Sung-Nam Lee, **Kyung-Won Park***, *Energies* 15 (2022) 7961
 15. "High-performance free-standing hybrid solid electrolyte membrane combined with Li₆.28Al_{0.24}La₃Zr₂O₁₂ and hexagonal-BN for all-solid-state lithium-based batteries", Ji-Hwan Kim, Deok-Hye Park, Jae-Sung Jang, Jae-Hoon Shin, Min-Cheol Kim, Sung-Beom Kim, Sang-Hyun Moon, Seong-Nam Lee, **Kyung-Won Park***, *Chemical Engineering Journal* 446(2) (2022) 137035
 16. "Polypyrrole coated g-C₃N₄/rGO/S composite as sulfur host for high stability lithium-sulfur batteries", Sang-Hyun Moon, Jae-Hoon Shin, Ji-Hwan Kim, Jae-Sung Jang, Sung-Beom Kim, Yu-Yeon Park, Seong-Nam Lee, **Kyung-Won Park***, *Mater Chem Phys* 287 (2022) 126267
 17. "Multifunctional Catalytic Porous Transport Layer Integrated with Chalcogen Compound for High-Performance Electrochemical Energy Devices", Min-Cheol Kim, Seunghwan Jo, Jaesung Jang, Yong-Soo Lee, Sang-Beom Han, Kyung-Won Park and Jung Inn Sohn, *Applied Surface Science* 590 (2022) 153030
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18. "Enhanced cycling performance of Fe-doped LiMn₂O₄ truncated octahedral cathodes for Li-ion batteries", Seong-Nam Lee, Sang-Hyun Moon, Deok-Hye Park, Ji-Hwan Kim, Jae-Sung Jang, Sung-Beom Kim, Jae-Hun Shin, Yu-Yeon Park, **Kyung-Won Park***, *ChemElectroChem* 9(11) (2022) e202200385
 19. "Highly Efficient Lithium-ion Exchange Membrane Water Electrolysis", Yong-Soo Lee, Yong-Hwan Mo, Deok-Hye Park, Woo-Jun Lee, Hak Joo Lee, Hyun-Suk Park, Sang-Beom Han, **Kyung-Won Park***, *Journal Power Sources*, 529 (2022) 231188
 20. "High absorption and fast polysulfides conversion of dual functional separator based on mesoporous-WC/rGO composite for lithium-sulfur batteries", Sang-Hyun Moon, Ji-Hwan Kim, Jae-Hoon Shin, Jae-Sung Jang, Sung-Beom Kim, Seong-Nam Lee, Suk-Hui Kwon, **Kyung-Won Park***, *Journal Alloys and Compounds*, 904 (2022) 164120
 21. "New Highly Stable Ionic Compounds Composed of Multivalent Graphene Quantum Dot Anions and Alkali Metal Cations", Hong-Chul Lim, Min-Chul Kim, Ayoung Kim, Eunji Park, Yunjae Park, Rakwoo Chang, Jong-In Hong, **Kyung-Won Park***, Ik-Soo Shin*, Hansu Kim*, *Batteries & Supercaps*, (2022) e202100337
 22. "Development of Ni-Ir oxide composites as oxygen catalysts for an anion-exchange membrane water electrolyzer", Deok-Hye Park, Min-Ha Kim, Hak-Joo Lee, Woo-Jun Lee, Jeong-Hyeon Byeon, Ji-Hwan Kim, Jae-Sung Jang, **Kyung-Won Park***, *Advanced Materials Interfaces*, (2022) 2102063
 23. "Coffee waste-derived one-step synthesis of a composite structure with Ge nanoparticles surrounded by amorphous carbon for Li-ion batteries", Jae-Hoon Shin, Deok-Hye Park, Woo-Jun Lee, Sang-Hyun Moon, Jin-Hyeok Choi, Ji-Hwan Kim, Jae-Sung Jang, Sung-Beom Kim, **Kyung-Won Park***, *Journal of Alloys and Compounds* 889 (2021) 161685
 24. "Mesoporous Spinel Ir-doped NiCo₂O₄ Nanostructure as an Efficient Catalyst for Oxygen Evolution Reaction" Hak Joo Lee, Deok-Hye Park, Woo-Jun Lee, Sang-Beom Han, Min-Ha Kim, Jeong-Hyeon Byeon, **Kyung-Won Park***, *Applied Catalysis A* 626 (2021) 118377
 25. "Enhanced electrochemical performance of a selectively formed V₂O₃/C composite structure for Li-ion batteries", Ji-Hwan Kim, Yo-Seob Kim, Sang-Hyun Moon, Min-Cheol Kim, Jin-Hyeok Choi, Deok-Hye Park, Jae-Hoon Shin, **Kyung-Won Park***, *Electrochimica Acta*, 389 (2021) 138685
 26. "Li-ion diffusivity and electrochemical performance of high-nickel cathode material doped with fluoride ions", Sung-Beom Kim, Hyeona Kim, Deok-Hye Park, Ji-Hwan Kim, Jae-Hoon Shin, Jae-Sung Jang, Sang-Hyun Moon, Jin-Hyuk Choi, **Kyung-Won Park***, *Journal of Power Sources*, 506 (2021) 230219
 27. "Top-down preparation of Ni-Pd-P@graphitic carbon core-shell nanostructure for electrocatalytic reactions", Deok-Hye Park, Yo-Seob Kim, Sang-Beom Han, Woo-Jun Lee, Hak-Joo Lee, Yong-Soo Lee, Sang-Hyun Moon, **Kyung-Won Park***, *International Journal of Hydrogen Energy*, 46 (2021) 22499-22507
 28. "Synergistically enhanced electrocatalytic stability of Pt catalyst supported by doped porous carbon nanostructure", Suk-Hui Kwon, Seul-Gi Lee, Sang-Beom Han, **Kyung-Won Park***, *Electrocatalysis* 11(5) (2021) 497-504
 29. "1T-MoS₂/carbon nanofiber composite as an interlayer fabricated by an in situ electrochemical fabrication method for lithium-sulfur batteries", Sang-Hyun Moon, Min-Cheol Kim, Hyeona Kim, Yo-Seob Kim, Jin-Hyeok Choi, **Kyung-Won Park***, *Journal of Alloys Compounds* 857 (2020) 158236
 30. "Synthesis of highly conductive titanium suboxide support materials with superior electrochemical durability for proton exchange membrane fuel cells", Min-Cheol Kim, Namchul Cho, Tae Jun Kang, Nguyen The Manh, Young-Woo Lee, Kyung-Won Park, **Molecular Crystals and Liquid Crystals**,
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707(1) (2020) 110–117

31. "Antioxidant activity of hydrogen water mask pack composed of gel-type emulsion and hydrogen generation powder", Hye-Jin Kwon, Sang-Beom Han, **Kyung-Won Park***, **International Journal of Molecular Sciences**, 21(24) (2020) 9731
 32. "Cycling system for decomposition of gaseous benzene by hydrogen peroxide with Fe-containing activated carbon", Yong-Soo Lee, Y.-H Mo, S.-B. Han, JiHyeon Song, Seongho Hong, **Kyung-Won Park***, **RSC Advances** 10 (2020) 39121-39129
 33. "Improved electrochemical properties of $\text{LiNi}_0.8\text{Co}_0.15\text{Al}_0.05\text{O}_2$ cathode materials synthesized using micelle structures", Sang-Hyun Moon, Eun-Soo Kim, Ji-Eun Lee, Yeon-Kyung Shin, Min-Cheol Kim, **Kyung-Won Park***, **Journal of Solid State Electrochemistry** 24 (2020) 2233-2240
 34. "Fluorine doped $\text{LiNi}_0.8\text{Mn}_0.1\text{Co}_0.1\text{O}_2$ cathode for high-performance lithium-ion batteries", Hyeona Kim, Min-Cheol Kim, Yo-Seob Kim, Jin-Hyeok Choi, **Kyung-Won Park***, **Energies** 13 (2020) 4808
 35. "Effect of Sb-doped SnO_2 nanostructures on electrocatalytic performance of a Pt catalyst for methanol oxidation reaction", Seul-Gi Lee, Sang-Beom Han, Woo-Jun Lee, **Kyung-Won Park***, **Catalysts** 10(8) (2020) 866
 36. "Enhanced electrochemical performance of MoS_2 -graphite nanosheet nanocomposites", Jin-Hyeok Choi, Min-Cheol Kim, Sang-Hyun Moon, Hyeona Kim, Yo-Seob Kim, **Kyung-Won Park***, **RSC Advances**, 10 (2020) 19077-19082
 37. " Ni_2P /graphitic carbon nanostructure electrode with superior electrochemical performance", Yo-Seob Kim, Min-Cheol Kim, Sang-Hyun Moon, Hyeona Kim, **Kyung-Won Park***, **Electrochimica Acta**, 341 (2020) 136045
 38. "Biomimetic Cathodes Applying Imprinted Carbon Paper with Vortex for Enhanced Oxygen Reduction Reaction of Lithium-Air Batteries", Joonha Jun, Min-Cheol Kim, Jin-Young So, Chan-Ho Lee, Hyeona Kim, Yo-Seob Kim, **Kyung-Won Park***, Won-Gyu Bae*, **ACS Sustainable Chemistry & Engineering** 8(11) (2020) 4325-4330
 39. "Porous SnO_2 nanostructure with a high specific surface area for improved electrochemical performance", Hyeona Kim, Min-Cheol Kim, Sung-Beom Kim, Yo-Seob Kim, Jin-Hyeok Choi, **Kyung-Won Park***, **RSC Advances** 10 (2020) 10519-10525
 40. "Polymeric Redox Mediator as a Stable Cathode Catalyst for Lithium- O_2 Batteries", Min-Cheol Kim, Sojeong Choi, Hyeona Kim, Sang-Beom Han, Sang-Hyun Moon, Eun-Soo Kim, Yo-Seob Kim, **Kyung-Won Park***, **Journal of Power Sources**, 453(31) (2020) 227850
 41. "Emission characteristics of particulate matter, odors, and volatile organic compounds from the grilling of pork", Yun-Yeong Lee, Hyungjoo Park, Yoonjoo Seo, Jeonghee Yun, Jihyun Kwon, Kyung-Won Park, Sang-Beom Han, Kyung Chel Oh, Jun-Min Jeon, Kyung-Suk Cho, **Environmental Research** 183 (2020) 109162
 42. "Mesoporous Iridium Oxide/Sb-doped SnO_2 Nanostructured Electrodes for Polymer Electrolyte Membrane Water Electrolysis", Sang-Beom Han, Yong-Hwan Mo, Yong-Soo Lee, Seul-Gi Lee, Deok-Hye Park and **Kyung-Won Park***, **International Journal of Hydrogen Energy** 45 (3) 1409-1416
 43. "Chemical valence electron-engineered $\text{LiNi}_0.4\text{Mn}_1.5\text{MtO}_4$ (Mt=Co and Fe) cathode materials with high-performance electrochemical properties", Min-Cheol Kim, Young-Woo Lee, Tuan Kiet Pham, Jung Inn Sohn, **Kyung-Won Park***, **Applied Surface Science** 504 (2020) Article 144514
 44. "F-doped $\text{Li}_1.15\text{Ni}_0.275\text{Ru}_0.575\text{O}_2$ cathode materials with long cycle life and improved rate performance", Sojeong Choi, Min-Cheol Kim, Sang-Hyun Moon, Hyeona Kim, **Kyung-Won**
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Park*, *Electrochimica Acta* 326 (2019) 135015

45. "Doped porous carbon nanostructure materials as non-precious metal cathode catalysts for oxygen reduction reaction in acid and alkaline media", Suk-Hui Kwon, Sang-Beom Han, Da-Hee Kwak, JiHyeon Song, and **Kyung-Won Park***, *Journal of Industrial Engineering Chemistry* 80 (2019) 171-181
 46. "Evaluation of antioxidant activity of amaranthus hypochondriacus L. extract using cyclic voltammetry", Hye-Jin Kwon, Na-Seul Jung, Sang-Beom Han, **Kyung-Won Park***, *Electrochemistry*, 87(6) (2019) 336-340
 47. "Facile one-pot synthesis of Ge/TiO₂ nanocomposite materials with improved electrochemical performance", Hyeona Kim, Min-Cheol Kim, Sojeong Choi, Sang-Hyun Moon, Yo-Seob Kim, **Kyung-Won Park***, *Nanoscale* 11 (2019) 17415-17424
 48. "Organic ligand-free PtIr alloy nanostructures for superior oxygen reduction and evolution reactions", Jin-Young Park, Hyun-Suk Park, Sang-Beom Han, Da-Hee Kwak, Ji-Eun Won, Taeho Lim, **Kyung-Won Park***, *Journal of Industrial Engineering Chemistry*, 77 (2019) 105-110
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218. "Nanoparticle Synthesis and Electrocatalytic Activity of Pt Alloys for Direct Methanol Fuel Cells" Seol-Ah Lee, **Kyung-Won Park**, Jong-Ho Choi, Boo-Kil Kwon, Yung-Eun Sung, *Journal of The Electrochemical Society*, 149(10) (2002) 1299-1304.

Invited Talks

1. Anion exchange membrane water electrolysis, KOLON, Seoul, Korea, April 2024.
 2. Pt-based alloy catalysts for fuel cells, Hyundai Motor Company, Seoul, Korea, November 2023.
 3. Nanostructure catalysts for low-temperature water electrolysis, Korean Electrochemical Society, Yeosu, Korea, October 2023.
 4. Coating technology for proton exchange membrane water electrolysis, Korean Institute of Energy Research, Daejeon, Korea, August 2022.
 5. Electrochemical technology for reducing VOCs, Sejong University, Seoul, May 2021.
 6. Catalysts for lithium-ion exchange membrane water electrolysis, Boyaz energy, Seoul, July 2020.
 7. Low-temperature electrochemical oxidation process for reducing VOCs, Sejong University, Seoul, September 2019.
 8. Oxide supports for high efficiency integrated reversible fuel cell, Chonnam University, Gwangju, Korea, September 2018.
 9. Optimization of metallic catalysts with enhanced electrochemical properties, Korean Institute of Energy Research, Jeju, Korea, November 2017.
 10. PtIr alloy catalysts for high efficiency integrated reversible fuel cell, Chonnam University, Gwangju, Korea, September 2017.
 11. Development of the catalysts for improved electrochemical reactions, Korean Institute of Energy Research, Jeju, Korea, November 2016.
 12. Development of Noble Metal-Free Low-Temperature Fuel Cells Based on High Functional and Multi-Dimensional Carbon Nanostructures, Korea Institute of Energy and Resources Technology Evaluation and Planning, Seoul, Korea, August 2016.
 13. Development of Pt-based multi-metallic catalysts with highly electrochemical activity and stability, Korea Institute of Energy and Resources Technology Evaluation and Planning, Seoul, Korea, November 2015.
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14. Catalysts for high efficiency integrated reversible fuel cell, Chonnam University, Gwangju, Korea, September 2015.
 15. Development of Noble Metal-Free Low-Temperature Fuel Cells Based on High Functional and Multi-Dimensional Carbon Nanostructures, Korea Institute of Energy and Resources Technology Evaluation and Planning, Seoul, Korea, August 2015.
 16. Nanostructure electrodes for electrochemical power sources, Kyunghee University, Yongin, Korea, November 2011.
 17. Synthesis of nanostructure electrodes for electrochemical power sources, Youngnam University, Daegu, Korea, April 2011.
 18. Nanostructure catalysts for polymer electrolyte membrane fuel cells, Cheongju University, Daegu, Korea, April 2010.
 19. Nanostructure materials for dye-sensitized solar cells, Gusan University, Daegu, Korea, January 2010.
 20. Nanostructure catalysts for low-temperature fuel cells, Gwangju Institute of Science and Technology, Gwangju, Korea, October 2009.
 21. Nanostructure catalysts for low-temperature fuel cells, Korea Research Institute of Chemical Technology, Daejeon, Korea, August 2009.
 22. Nanostructures for polymer electrolyte membrane fuel cells, Korean Institute of Energy Research, Daejeon, Korea, August 2009.
 23. Design of Nanostructured Electrocatalysts for Polymer Electrolyte Membrane Fuel Cells, Korean Institute of Ceramic Engineering and Technology, Icheon, Korea, March 2009.
 24. Nanotechnology for H₂-MeOH fuel cells, KIST, Seoul, Korea, July 2008.
 25. Nanostructures for Microbial Fuel Cells, Gangwon University, Chuncheon, Korea, March 2007.
 26. Nanostructures for Hydrogen/Methanol Fuel Cells, Sungkyunkwan University, Suwon, Korea, March 2006.

Patents

Registered

1. S.-B. Han, K.-W. Park *et al.* Decomposition and circulation system of volatile organic compounds using coal-based activated carbon and hydrogen peroxide, *Republic of Korea Patent No. 10-2619784*, Dec/27/23.
2. D.-H. Park, K.-W. Park *et al.* Enhanced electrocatalytic performance of Metal Phosphide/graphite, *Republic of Korea Patent No. 10-2582151*, Sep/19/23.
3. D.-H. Park, K.-W. Park *et al.* Catalyst for oxygen evolution comprising transition metal oxide and nickel oxide, preparation method thereof, and water electrolysis using the same, *Republic of Korea Patent No. 10-2580930*, Sep/15/23.
4. J.-H. Kim, K.-W. Park *et al.* Selective formation of V₂O₃/C composite electrode structure for lithium-based batteries, *Republic of Korea Patent No. 10-2531848*, May/09/23.
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79. S.-B. Han, K.-W. Park *et al.* Fuel Cell comprising Cathode electrode using iron redox couple, *Republic of Korea Patent No. PCT/KR2011/005964*, 2011.08.12.
80. Y.-W Lee, K.-W. Park *et al.* Pt-Ni Alloy Nanodendrites for Fuel Cell Catalyst, *Republic of Korea Patent No. 10-2011-0143287*, 2011.12.27.
81. Y.-W. Lee, K.-W. Park *et al.* Shape-controlled Pt/C catalyst, method for preparation the same, and fuel cell using the same, *Republic of Korea Patent No. 10-2011-0111488*, 2011.10.28.
82. D.-Y. Kim, K.-W. Park *et al.* Nitrogen doped core/shell nanostructure catalyst and its preparation method, *Republic of Korea Patent No. 10-2011-0104014*, 2011.10.12.

Technology Transfers

Intellectual Discovery Co., Ltd. | \$27,000 | 01/2013

Title: Transfer of invention to develop a new concept fuel cell using electrochemical reduction reactions

Role: Principal Investigator

Boyaz Energy Co., Ltd. | \$1,800 | 12/2016

Title: Carbon-based composite structure oxygen reduction catalyst technology for low-temperature fuel cells

Role: Principal Investigator

Boyaz Energy Co., Ltd. | \$7,200 | 11/2017

Title: Fuel cells and fuel cells including cathode electrodes using iron redox pairs

Role: Principal Investigator

Wifinetech Co., Ltd. | \$3,600 | 03/2019

Title: Method for producing porous carbon catalyst doped with transition metal and nitrogen

Role: Principal Investigator

CU Energy Co., Ltd. | \$3,600 | 04/2019

Title: Manufacturing method of positive electrode active material

Role: Principal Investigator

Dongwoo Cast Co., Ltd. | \$3,600 | 04/2019

Title: Titanium oxide-coated cathode active material for lithium-ion batteries and method for manufacturing the same

Role: Principal Investigator

Dongwoo Cast Co., Ltd. | \$3,600 | 04/2019

Title: Nanostructure-controlled alloy for fuel cell catalyst electrode and manufacturing method thereof

Role: Principal Investigator

JIS Co., Ltd. | \$3,600 | 05/2019

Title: Catalyst support for oxygen reduction electrode

Role: Principal Investigator

JIS Co., Ltd. | \$3,600 | 05/2019

Title: Core/shell structured nano support for catalyst electrodes for fuel cells and method of manufacturing

the same

Role: Principal Investigator

SM Hitech Co., Ltd. | \$4,500 | 08/2021

Title: MoS₂-TiN thin film electrode manufacturing method for improved electrochemical performance of lithium ion batteries

Role: Principal Investigator

SAMIL Chemical Co., Ltd. | \$4,500 | 09/2021

Title: Method for manufacturing porous germanium-carbon composite using glucose

Role: Principal Investigator

FILAST Chemical Co., Ltd. | \$4,500 | 10/2021

Title: Method for simultaneous removal of nitrogen oxides and sulfur oxides

Role: Principal Investigator

Boyaz Energy Co., Ltd. | \$2,700 | 11/2021

Title: Method for manufacturing a porous polymer separator and porous polymer separator manufactured thereby

Role: Principal Investigator

Boyaz Energy Co., Ltd. | \$2,700 | 11/2021

Title: SnO₂ nanoparticles with porous structure and method of manufacturing the same

Role: Principal Investigator

Hydrogine Tech Co., Ltd. | \$18,000 | 07/2022

Title: Precious metal/transition metal oxide catalyst for water electrolysis and method for manufacturing the same

Role: Principal Investigator