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EDUCATION

Gwangju Institute of Science and Technology	Ph.D	Materials Science and Engineering	**2012**
Gwangju Institute of Science and Technology	MS	Materials Science and Engineering	**2007**
Sungkyunkwan University, Seoul, Korea	BS	Advanced Materials Science and Engineering	**2005**

PROFESSIONAL ACTIVITIES

- Principal Researcher, Fuel Cell Research & Demonstration Center, Korea Institute of Energy Research (KIER), South Korea, February 2020 to Present
- Senior Researcher, Fuel Cell Research & Demonstration Center, Korea Institute of Energy Research (KIER), South Korea, March 2016 to February 2020
- Postdoctoral fellow, University of Waterloo, Canada, August 2013 to January 2016
- Postdoctoral fellow, Daegu Gyeongbuk Institute of Science and Technology, South Korea, February 2012 to May 2013

AWARD AND HONORS

- 2018 Outstanding Performing Researcher Award, President's Award, in National Research Council of Science & Technology (NST)
- 2009 grand prize for “the energy & environment” article competition from the Knowledge and Economy Minister, KIChE meeting in Spring 2009.

MAIN SCIENTIFIC PUBLICATION

Among 59 publications in international journals (Selected)

- M. J. Jang, J. C. Yang, J. M. Lee, Y. S. Park, J. H. Jeong S. M. Park, J. Y. Jeong, Y. Yine, **M. H. Seo*,** S. M. Choi*, K. H. Lee* “Superior performance and stability of anion exchange membrane water electrolysis: pH-controlled copper cobalt oxide nanoparticle for oxygen evolution reaction” **J. Mater. Chem. A,** (2020) 8, 4290-4299 **(IF=10.733).**
- D. W. Lee, Y. M. Kim, Y. H. Kwon, J. M. Lee, T. W. Kim, **M. H. Seo*,** K. S. Kim* and H. J. Kim* “Boosting the electrocatalytic glycerol oxidation performance with highly-dispersed Pt nanoclusters loaded on 3D graphene-like microporous carbon” **Appl. Catal. B** (2019) 245, 555-568 **(IF=14.229)**
- Y. S. Park, M. J. Jang, J. H. Jeong, S. M. Park, X. Wang, **M. H. Seo*,** S. M. Choi*, and J. C. Yang* “Hierarchical Chestnut-Burr Like Structure of Copper Cobalt Oxide

Electrocatalyst Directly Grown on Ni Foam for Anion Exchange Membrane Water Electrolysis" **ACS Sustain. Chem. Eng.,** (2020) 8, 6, 2344-2349 **(IF=6.970)**

- **M. H. Seo**, M. G. Park, D. U. Lee, X. Wang, W. Ahn, S. H. Noh, S. M. Choi, B. C. Han* and Z. Chen* "Understanding the Enhanced Bifunctional Activity and Stability of Oxygen Catalysis by Computational and Experimental Study: Synergistic Effect of Pd nanoparticles and Highly Ordered Mesoporous Co3O4" **Appl. Catal. B** (2018) 239, 677-687 **(IF=14.229)**
- S. H. Noh, C. A. Kwon, J. M. Hwang, T. Ohsaka, B. J. Kim, T. Y. Kim,c Y. G. Yoon, Z. Chen, B. C. Han* and **M. H. Seo*** "Self-assembled nitrogen doped fullerenes and their catalysis for fuel cell and rechargeable metal-air battery applications" **Nanoscale** (2017) 9, 7307-7688 **(IF=6.97)** ***- this paper was highlighted as a cover letter-***
- **M. H. Seo**, H. W. Park, D. U. Lee, M. G. Park and Z. Chen "Design of highly active perovskite oxides for oxygen evolution reaction combining experimental and ab-initio studies" **ACS Catal.** (2015) 5, 4337–4344 **(IF = 12.221)**
- **M. H. Seo**, D. Higgins, G. Jiang, S. M. Choi, B. Han and Z. Chen, "The theoretical insights into highly durable iron phthalocyanine derived non-precious catalyst for oxygen reduction reaction.", **J. Mater. Chem. A.** 2 (2014) 19707-19716 **(IF = 10.856)**
- D. C. Higgins, M. A. Hoque, **M. H. Seo,** R. Wang, F. Hassan, J. Y. Choi, M. Pritzker, A. Yu , J. Zhang, and Z. W. Chen, "Development and Simulation of Sulfur-doped Graphene Supported Platinum with Exemplary Stability and Activity Towards Oxygen Reduction.", **Adv. Funct. Mater.** 24, (2014) 27, 4325-4336, **(IF = 15.621)** ***- this paper was highlighted as a cover letter-***
- **M. H. Seo**, D. Higgins, G. Jiang, S. M. Choi, B. Han and Z. Chen, "The theoretical insights into highly durable iron phthalocyanine derived non-precious catalyst for oxygen reduction reaction."**, J. Mater. Chem. A.** 2 (2014) 19707-19716 **(IF = 10.856)**
- **M. H. Seo**, S. M. Choi, E. J. Lim, I. H. Kwon, J. K. Seo, S. H. Noh, W. B. Kim, and B. Han, "Toward new support materials in fuel cell: the theoretical and experimental study of the nitrogen doped graphene.", **ChemSusChem.** 7, (2014) 9, 2609-2620 **(IF = 7.804).**
- **M. H. Seo**, S. M. Choi, J. K. Seo, S. H. Noh, W. B. Kim and B. C. Han, "The graphene-supported palladium and palladium-yttrium nanoparticles for the oxygen reduction and ethanol oxidation reactions: Experimental measurement and Computational validation", **Appl. Catal. B-Enviro.** 129 (2013) 163-171 **(IF = 14.229).**

RESEARCH INTERESTS

- Experimental and computational validation for activity and durability of catalysts via computational calculation (e.g., ab-initio and molecular dynamics study) in electrochemical energy conversion systems, which are acid, based polymer electrolyte fuel cell, alkaline fuel cell, metal-air battery and hydrogen production system.
- The development of advanced precious/non-precious ORR/OER catalysts in polymer electrolyte fuel cells and potentially other electrochemical energy conversion/storage devices.
- Developing MEA fabrication by controlling nanostructure in PEM fuel cell & hydrolysis systems
- Force Field developments using the artificial intelligent (AI) technology approach (neural network modeling) for multiscale molecular dynamics.