

# Sanghee Nam

Ph. D candidate

National Creative Research Initiative for Functionally Antagonistic Nano-Engineering

Department of Mechanical Engineering

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## Education

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- ◆ Ph.D. Korea Advanced Institute of Science and Technology, Department of Mechanical Engineering, Feb. 2022, *Transition Metal Carbide – Carbon Fabrics for Energy Storage Devices*
- ◆ M.S. University of Erlangen-Nuremberg, Department of Chemical and Biological Engineering, Mar. 2017, *Layout of an up-scaled model of the internal flow of multi-hole nozzles for gasoline direct injection*
- ◆ B.S. Korea Polytechnic University, Department of Mechanical Engineering, Feb. 2015

## Professional Membership

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- ◆ Member of The Korean Society for Composite Materials (KSCM)
- ◆ Member of The Korean Institute of Electrical and Electronic Material Engineers (KIEEME)
- ◆ Member of Korean Carbon Society (KCS)
- ◆ Member of The Korean Society of Mechanical Engineers (KSME)

## Awards and Honors

- ◆ Best Paper Award, Development of MXene/Graphene Oxide Composite for Lithium-Sulfur Battery, The Korean Society for Composite Materials, 25<sup>th</sup> June 2021
- ◆ Best Teaching Assistant Award, Korea Advanced Institute of Science and Technology, 7<sup>th</sup> June 2021
- ◆ Best Teaching Assistant Award, Korea Advanced Institute of Science and Technology, 10<sup>th</sup> September 2020
- ◆ Best Paper Award, Development of Functionalized Titanium Carbide and Vanadium Pentoxide Nanowires-CNT for Lithium-Ion-Batteries, The 4<sup>th</sup> International Conference on Active Materials and Soft Mechatronics 2019, 18<sup>th</sup> October 2019
- ◆ Best Presentation Award, 2D Layered  $Ti_3C_2T_x$  Negative Electrode based Activated Carbon Woven Fabric for Structural Lithium Ion Battery, The Korean Society for Composite Materials, 23<sup>rd</sup> December 2018
- ◆ Best Student Award, The 11<sup>st</sup> Advanced Power and Desalination Plant, Ministry of Land, Infrastructure and Transport, Republic of Korea, 29<sup>th</sup> August 2014

## Patents

1. Vanadium Carbide Nanowire and Preparing Method thereof, Republic of Korea, 6<sup>th</sup> April 2021, 10-2021-0044757

## Journal Publications

1. **Sanghee Nam**, Pitchai Thangasamy, Saewoong Oh, Manmatha Mahato, Nikhil Koratkar, Il-Kwon Oh, “A dual-ion accepting vanadium carbide nanowire cathode integrated with carbon cloths for high cycling stability”, *Nanoscale*, Vol. 12, 2020, 20868
2. **Sanghee Nam**, Jong-Nam Kim, Saewoong Oh, Jaehwan Kim, Chi Won Ahn, Il-Kwon Oh, “ $Ti_3C_2T_x$  MXene for wearable energy devices: Supercapacitors and triboelectric nanogenerators”, *APL Materials*, Vol. 8, 2020, 110701
3. **Sanghee Nam**, Sima Umrao, Saewoong Oh, Kang Ho Shin, Ho Seok Park, Il-Kwon Oh, “Sonochemical self-growth of functionalized titanium carbide

- nanorods on Ti<sub>3</sub>C<sub>2</sub> nanosheets for high capacity anode for lithium-ion batteries*”, Composite Part B: Engineering, Vol. 181, 2020, 107583
4. Manmatha Mahato, Rassoul Tabassian, Van Hiep Nguyen, Saewoong Oh, **Sanghee Nam**, Won-Jun Hwang, Kwang Jin Kim, Il-Kwon Oh, “*Sulfur- and Nitrogen-Rich Porous  $\pi$ -Conjugated COFs as Stable Electrode Materials for Electro-Ionic Soft Actuators*”, Advanced Functional Materials, Vol. 30, Issue 46, 2020, 2003863
  5. Manmatha Mahato, Rassoul Tabassian, Van Hiep Nguyen, Saewoong Oh, **Sanghee Nam**, Won-Jun Hwang, Il-Kwon Oh, “*CTF-based soft touch actuator for playing electronic piano*”, Nature Communications, Vol. 11, 2020, 5358
  6. Van Hiep Nguyen, Rassoul Tabassian, Saewoong Oh, **Sanghee Nam**, Manmatha Mahato, Pitchai Thangasamy, Araz Rajabi-Abhari, Won-Jun Hwang, Ashhad Kamal Taseer, Il-Kwon Oh, “*Stimuli-Responsive MXene-Based Actuators*”, Advanced Functional Materials, Vol. 30, Issue 47, 2020, 1909504
  7. Pitchai Thangasamy, Saewoong Oh, **Sanghee Nam**, Hyacinthe Randriamahazaka, Il-Kwon Oh, “*Ferrocene-Incorporated Cobalt Sulfide Nanoarchitecture for Superior Oxygen Evolution Reaction*”, Small, Vol. 16, Issue 31, 2020, 2001665
  8. Pitchai Thangasamy, Saewoong Oh, **Sanghee Nam**, Il-Kwon Oh, “*Rose-like MoS<sub>2</sub> nanostructures with a large interlayer spacing of  $\sim 9.9$  Å and exfoliated WS<sub>2</sub> nanosheets supported on carbon nanotubes for hydrogen evolution reaction*”, Carbon, Vol. 158, 2020, 216
  9. Saewoong Oh, Van Hiep Nguyen, Van-Tien Bui, **Sanghee Nam**, Manmatha Mahato, Il-Kwon Oh, “*Intertwined Nanosponge Solid-State Polymer Electrolyte for Rollable and Foldable Lithium-Ion Batteries*”, ACS Applied Materials and Interfaces, Vol. 12, Issue 10, 2020, 11657
  10. Sima Umrao, Rassoul Tabassian, Jaehwan Kim, Van Hiep Nguyen, Qitao Zhou, **Sanghee Nam**, Il-Kwon Oh, “*MXene artificial muscles based on ionically cross-linked Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> electrode for kinetic soft robotics*”, Science Robotics, Vol. 4. 2019, eaaw7797
  11. Ji-Myeong Son, Saewoong Oh, Seok-Hu Bae, **Sanghee Nam**, and Il-Kwon Oh, “*A Pair of NiCo<sub>2</sub>O<sub>4</sub> and V<sub>2</sub>O<sub>5</sub> Nanowires Directly Grown on Carbon Fabric for Highly Bendable Lithium-Ion Batteries*”, Advanced Energy Materials, Vol. 9,

2019, 1900477

12. **Sanghee Nam**, Sima Umrao, Saewoong Oh, Il-Kwon Oh, “*2D Layered  $Ti_3C_2T_x$  Negative Electrode based Activated Carbon Woven Fabric for Structural Lithium Ion Battery*”, Composite Research, Vol. 32, Issue 5, 2019, 296

### International Conference

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1. **Sanghee Nam**, Saewoong OH, Il-Kwon Oh, “*Vanadium carbide nanowires cathode with excellent cycle stability for lithium-ion batteries*”, SPIE Smart Structures + Nondestructive Evaluation 2021 (SPIE 2021), Online, March 22-26, 2021
2. **Sanghee Nam**, Saewoong Oh, Il-Kwon Oh, “*Facile Hydrothermally Grown Vanadium Carbide Nanowires Cathode Materials for Lithium-Ion Batteries*”, The 6<sup>th</sup> International Conference on Electronic Materials and Nanotechnology for Green Environmental (ENGE 2020), Jeju, Republic of Korea, November 1-4, 2020
3. Saewoong Oh, **Sanghee Nam**, Il-Kwon Oh, “*High-strength Intertwined Nanosponge Solid-state Composite Polymer Electrolyte for Multifunctional Lithium-ion Battery*”, The 6<sup>th</sup> International Conference on Electronic Materials and Nanotechnology for Green Environmental (ENGE 2020), Jeju, Republic of Korea, November 1-4, 2020
4. **Sanghee Nam**, Saewoong Oh, and Il-Kwon Oh, “*Development of Functionalized Titanium Carbide and Vanadium Pentoxide Nanowires-CNT for Lithium-Ion-Batteries*”, The 4<sup>th</sup> International Conference on Active Materials and Soft Mechatronics (AMSM 2019), Incheon, Republic of Korea, October 16-19, 2019
5. Saewoong Oh, Ji-Myeong Son, **Sanghee Nam**, Il-Kwon Oh, “*Directly Grown Nanowires on Carbon Fabric for Flexible Lithium-ion Batteries*”, The 4<sup>th</sup> International Conference on Active Materials and Soft Mechatronics (AMSM 2019), Incheon, Republic of Korea, October 16-19, 2019
6. **Sanghee Nam**, Sima Umrao, Il-Kwon Oh, “*Activated carbon woven fabric based MXene and vanadium oxide nanowire electrode for lithium ion battery*”, The 3<sup>rd</sup> International Conference on Active Materials and Soft Mechatronics (AMSM 2018), Daejeon, Republic of Korea, October 23-26, 2018

## Domestic Conference

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1. **Sanghee Nam**, Manmatha Mahato, Il-Kwon Oh, “Functionally Antagonistic MXene and Graphene Oxide Multilayer Composites for Suppressing the Shuttle Effect in Lithium-Sulfur Battery”, The Korean Institute of Electrical and Electronic Material Engineers (KIEEME 2021 Summer), June 30-July 2, 2021
2. **Sanghee Nam**, Il-Kwon Oh, “A Study of MXene/Graphene Oxide Composites for Lithium-Sulfur Battery”, The Korean Society for Composite Materials (KSCM 2021 Spring), June 24-25, 2021
3. **Sanghee Nam**, Pitchai Thangasamy, Saewoong Oh, Manmatha Mahato, Il-Kwon Oh, “Development of vanadium carbide nanowire cathode materials for lithium-ion batteries”, The Korean Society for Composite Materials (KSCM 2020 Spring), August 18-19, 2020
4. Saewoong Oh, **Sanghee Nam**, Il-Kwon Oh, “*Rollable and Foldable Lithium-Ion Battery based on Solid-state Composite polymer Electrolyte*”, The Korean Society for Composite Materials (KSCM 2020 Spring), August 18-19, 2020
5. **Sanghee Nam**, Saewoong Oh, Il-Kwon Oh, “*Development of vanadium pentoxide with high capacity for lithium-ion batteries*”, The Korean Society for Composite Materials (KSCM 2019), December 4-5, 2019
6. **Sanghee Nam**, Sima Umrao, and Il-Kwon Oh, “*Development of titanium carbide based on carbon woven fabric for negative electrode*”, The Korean Society for Composite Materials (KSCM 2019), April 3-6, 2019
7. **Sanghee Nam**, Sima Umrao, and Il-Kwon Oh, “*2D Layered  $Ti_3C_2T_x$  Negative Electrode based Activated Carbon Woven Fabric for Structural Lithium Ion Battery*”, The Korean Society for Composite Materials (KSCM 2018), November 22-23, 2018
8. Saewoong Oh, Seok-Hu Bae, Ji-Myeong Son, **Sanghee Nam**, Il-Kwon Oh, “*All solid state lithium ion batteries based on carbon fiber*”, The Korean Society for Composite Materials (KSCM 2018), November 22-23, 2018
9. Sima Umrao, Jaehwan Kim, **Sanghee Nam**, Manzoor Muhammad Taha, Il-Kwon Oh, “*MXene-polymer hybrids for Ionic soft Actuator*”, The Korean Society for Composite Materials (KSCM 2018), November 22-23, 2018
10. **Sanghee Nam**, IlKwon Oh, “*Electrode Materials for Structural Supercapacitor*”

*based on Functionalized Carbon Fiber via Electrospinning*", Korean Carbon Society (KSC 2018), May 17-18, 2018

11. **Sanghee Nam**, Sihwa Lee, and Il-Kwon Oh, "*Anode Materials for Structural Supercapacitor Using Carbon Fabric with Load-bearing*", The Korean Society for Composite Materials (KSCM 2018), April 5-7, 2018