

Curriculum Vitae



Gwangwoo Kim

Department of Engineering Chemistry

Chungbuk National University (CBNU)

1 Chungdae-ro, Seowon-gu, Cheongju, Chungbuk 28644, Korea

Email: kw820@cbnu.ac.kr, kkww820@gmail.com

Mobile: +82-10-2041-5956

Office: +82-43-261-2472

Lab Website: <https://kkww820.wixsite.com/gwangwoo>

Education

- 2013.03 ~ 2019.02 M.S-Ph.D. in Energy Engineering
Ulsan National Institute of Science and Technology (UNIST), Korea
Advisor: Prof. Hyeon Suk Shin
Thesis: Fabrication of Various In-Plane Heterostructures by Using
Conversion Reaction of Monolayer h-BN to Graphene on Platinum
- 2009.03 ~ 2013.02 Bachelor's in chemical engineering
Ulsan National Institute of Science and Technology (UNIST), Korea

& Professional Experience

- 2019.03 ~ Present Assistant Professor in Engineering Chemistry
Chungbuk National University, Korea
- 2021.02 ~ 2023.08 Postdoctoral fellow in Electrical and System Engineering
University of Pennsylvania, U.S. (**Advisor:** Prof. Deep Jariwala)
- 2020.03 ~ 2021.01 Postdoctoral fellow in Mechanical Science and Engineering
University of Illinois at Urbana-Champaign (UIUC), U.S.
- 2019.03 ~ 2020.02 Postdoctoral fellow in chemistry
Ulsan National Institute of Science and Technology (UNIST), Korea

Research Interest

- Nanomaterials, nanoelectronic devices, and nanophotonics based on 2D materials and their physical-chemical properties analysis.
- Multi-functional materials (2D vertical & lateral heterostructures, 2D/3D combinations) synthesis, micro/nanofabrication, and characterization.

Awards and Honors

1. Global Ph. D. Fellowship, National Research Foundation of Korea (NRF), 2013~2018
2. Best Doctoral Dissertation Award, Korea Chemical Society (KCS), 2019
3. Best Oral Presentation Award, Korea Chemical Society (KCS), 2019
4. Best Poster Presentation Award, International Union of Materials Research Societies-International Conference on Electronic Materials (IUMRS-ICEM), 2018
5. Best Poster Presentation Award, Korea Chemical Society (KCS), 2018
6. Best Poster Presentation Award, Korea Carbon Society, 2018
7. Best Oral Presentation Award, Korea Chemical Society (KCS), 2017
8. Best Poster Presentation Award, International Conference on Advanced Materials and Devices (ICAMD), 2017
9. Outstanding Graduate Student Award, UNIST, 2015
10. Outstanding Graduate Student Award, UNIST, 2013

Publications (Total = 31, Citations = 2093, H-Index = 19)

First author papers

1. Unusual Raman Enhancement Effect of Ultrathin Copper Sulfide
G. Kim⁺, D. W. Jeong⁺, G. Lee, S. Lee, K. Y. Ma, H. Hwang, S. Jang, J. Hong, S. Pak, S. Cha, D. Cho, S. Kim, J. Lim, Y. -W. Lee, H. S. Shin^{*}, A. -R. Jang^{*}, J. Lee^{*}
Small **2024**, *Accepted*
2. Spatially controlled Two-Dimensional Quantum Heterostructures
G. Kim⁺, S. Song⁺, D. Jariwala^{*}
Mater. Res. Lett. **2023**, *11*, 327
3. High density, localized quantum emitters in strained 2D semiconductors
G. Kim, H. M. Kim, P. Kumar, M. Rahaman, C. E. Stevens, J. Jeon, K. Jo, K. H. Kim, N. Trainor, H. Zhu, B. H. Sohn, E. A. Stach, J. R. Hedrickson, N. R. Glavin, J. Suh, J. M. Redwing, D. Jariwala^{*}
ACS Nano **2022**, *16*, 9651

4. Blue emission at atomically sharp 1D heterojunctions between graphene and h-BN
G. Kim⁺, K. Y. Ma⁺, M. Park, M. Kim, J. Jeon, J. Song, J. E. Barrios-Vargas, Y. Sato, Y.-C. Lin, K. Suenaga, S. Roche, S. Yoo, B.-H. Sohn, S. Jeon, H. S. Shin*
[Nat. Commun.](#) **2020**, *11*, 5359
5. Spatially controlled lateral heterostructures of graphene and transition metal dichalcogenides toward atomically thin and multi-functional electronics
G. Kim, H. S. Shin*
[Nanoscale](#) **2020**, *12*, 5286
6. Planar and van der Waals Heterostructures for Vertical Tunnelling Single Electron Transistors
G. Kim, S. S. Kim, J. Jeon, S. I. Yoon, S. Hong, Y. J. Cho, A. Misra, S. Ozdemir, D. Ghazaryan, A. Mishchenko, D. V. Andreeva, Y. J. Kim, H. J. Chung, A. K. Geim, K. S. Novoselov*, B. S. Sohn*, H. S. Shin*
[Nat. Commun.](#) **2019**, *10*, 230 [[Highlighted in Nat. Nanotechnol.](#) **2019**, *14*, 100]
7. Hexagonal Boron Nitride/Au Substrate for Manipulating Surface Plasmon and Enhancing Capability of Surface-Enhanced Raman Spectroscopy
G. Kim, M. Kim, C. Hyun, S. Hong, K. Y. Ma, H. Lim*, H. S. Shin*
[ACS Nano](#) **2016**, *10*, 11156
8. Catalytic Conversion of Hexagonal Boron Nitride to Graphene for In-Plane Heterostructures
G. Kim⁺, H. Lim⁺, K. Y. Ma, A. R. Jang, G. H. Ryu, M. Jung, H. J. Shin, Z. Lee, H. S. Shin*
[Nano Lett.](#) **2015**, *15*, 4769
9. Growth of High-Crystalline, Single-Layer Hexagonal Boron Nitride on Recyclable Platinum Foil
G. Kim⁺, A. R. Jang⁺, H. Y. Jeong, Z. Lee, D. J. Kang, H. S. Shin*
[Nano Lett.](#) **2013**, *13*, 1834

Co-author papers

10. Negative Capacitance Field-Effect Transistors Based on Ferroelectric AlScN and 2D MoS₂
S. Song⁺, K.-H. Kim⁺, S. Chakravarthi, Z. Han, **G. Kim**, K. Y. Ma, H. S. Shin, R. H. Olsson III, D. Jariwala*
Appl. Phys. Lett. **2023**, 123, 183501
11. Metal-Ferroelectric AlScN-Semiconductor Memory Devices on SiC Wafers
Y. He⁺, S. Chen⁺, M. M. A. Fiagbenu, C. Leblanc, P. Musavigharavi, **G. Kim**, X. Du, J. Chen, X. Liu, E. A. Stach, R. H. Olsson, D. Jariwala*
Appl. Phys. Lett. **2023**, 123, 122901
12. Tailoring Exciton Dynamics in TMDC Heterobilayers in the Quantum Plasmonic Regime
M. Rahaman, **G. Kim**, K. Y. Ma, S. Song, H. S. Shin, D. Jariwala*
NPJ 2D Mater. Appl. **2023**, 7, 66
13. Wafer-scale growth of two-dimensional, phase-pure InSe
S. Song, S. Jeon, M. Rahaman, J. Lynch, P. Kumar, S. Chakravarthi, **G. Kim**, X. Du, E. Blanton, K. Kisslinger, M. Snure, N. R. Glavin, E. A. Stach, R. H. Olsson, D. Jariwala*
Matter **2023**, 6, 3483
14. Scalable CMOS back-end-of-line-compatible AlScN/two-dimensional channel ferroelectric field-effect transistors
K.-H. Kim, S. Oh, M. M. A. Fiagbenu, J. Zheng, P. Musavigharavi, P. Kumar, N. Trainor, A. Aljarb, Y. Wan, H. M. Kim, K. Katti, S. Song, **G. Kim**, Z. Tang, J.-H. Fu, M. Hakami, V. Tung, J. M. Redwing, E. A. Stach, R. H. Olsson, D. Jariwala*
Nat. Nanotechnol. **2023**, 18, 1044
15. Microwave Facilitated Few-layer Covalent Organic Framework/Monolayer Transition Metal Dichalcogenide Heterostructures
L. K. Beagle*, D. C. Moore, **G. Kim**, L. D. Tran, P. Miesle, C. Nguyen, Q. Fang, K.-H. Kim, T. Prusnik, M. Newburger, R. Rao, D. Jariwala, J. Lou, L. A. Baldwin, N. R. Glavin*
ACS Appl. Mater. Interfaces **2022**, 14, 46876
16. Cavity-Enhanced Raman Scattering from 2D Hybrid Perovskites
A. Singh, J. Lynch, S. B. Anantharaman, J. Hou, S. Singh, G. Kim, A. D. Mohite, R. Singh, D. Jariwala*
J. Phys. Chem. C **2022**, 126, 11158

17. Epitaxial single-crystal hexagonal boron nitride multilayers on Ni (111)
K. Y. Ma, L. Zhang, S. Jin, Y. Wang, S. I. Yoon, H. Hwang, J. Oh, D. S. Jeong, M. Wang, S. Chatterjee, G. Kim, A.-R. Jang, J. Yang, S. Ryu, H. Y. Jeong, R. S. Ruoff*, M. Chhowalla*, F. Ding*, H. S. Shin*
Nature **2022**, 606, 88
18. Direct growth of hexagonal boron nitride on non-metallic substrates and its heterostructures with graphene
I. G. Juma, G. Kim, D. Jariwala, S. K. Behura*
iScience **2021**, 24, 103374
19. Ultralow dielectric constant amorphous boron nitride
S. Hong, C.-S. Lee, M.-H. Lee, Y. Lee, K. Y. Ma, G. Kim, S. I. Yoon, K. Ihm, K.-J. Kim, T. J. Shin, S. W. Kim, E.-C. Jeon, H. Jeon, J.-Y. Kim, H.-I. Lee, Z. Lee, A. Antidormi, S. Roche, M. Chhowalla*, H.-J. Shin*, H. S. Shin*
Nature **2020**, 582, 7813
20. Effect of Pt Crystal Surface on Hydrogenation of Monolayer h-BN and Its Conversion to Graphene
M. Kim, S. W. Moon, G. Kim, S. I. Yoon, K. C. Kim, S. K. Min*, H. S. Shin*
Chem. Mater. **2020**, 32, 4584
21. Layered material platform for surface plasmon resonance biosensing
F. Wu, P. A. Thomas, V. G. Kravets, H. O. Arola, M. Soikkeli, K. Iljin, G. Kim, M. Kim, H. S. Shin, D. V. Andreeva, C. Neumann, M. Küllmer, A. Turchanin, D. D. Fazio, O. Balci, V. Babenko, B. Luo, I. Goykhman, S. Hofmann, A. C. Ferrari, K. S. Novoselov*, A. N. Grigorenko*
Sci. Rep. **2019**, 9, 20286
22. AA'-Stacked Trilayer Hexagonal Boron Nitride Membrane for Proton Exchange Membrane Fuel Cells
S. I. Yoon, D. J. Seo, G. Kim, M. Kim, C. Y. Jung, Y. G. Yoon, S. H. Joo, T. Y. Kim*, H. S. Shin*
ACS Nano **2018**, 12, 10764
23. Evidence of Local Commensurate with Lattice Match of Graphene on Hexagonal Boron Nitride
N. Y. Kim, H. Y. Jeong, J. H. Kim, G. Kim, H. S. Shin, Z. Lee*
ACS Nano **2017**, 11, 7084

24. Probing Evolution of Twist-Angle-Dependent Interlayer Excitons in MoSe₂/WSe₂ van der Waals Heterostructure
P. K. Nayak, Y. Horbatenko, S. Ahn, [G. Kim](#), J. U. Lee, K. Y. Ma, A. R. Jang, H. Lim, D. Kim, S. Ryu, H. Cheong, N. Park, H. S. Shin*
[ACS Nano](#) **2017**, *11*, 4041
25. Chemical Vapor-Deposited Hexagonal Boron Nitride as a Scalable Template for High-Performance Organic Field-Effect Transistors
T. H. Lee, K. Kim, [G. Kim](#), H. J. Park, D. Scullion, L. Shaw, M. G. Kim, X. Gu, W. G. Bae, J. G. Santos, Z. Lee, H. S. Shin, Y. Nishi, Z. Bao*
[Chem. Mater.](#) **2017**, *29*, 2341
26. Prevention of Transition Metal Dichalcogenide Photodegradation by Encapsulation with h-BN Layers
S. Ahn, [G. Kim](#), P. K. Nayak, S. I. Yoon, H. Lim, H. J. Shin, H. S. Shin*
[ACS Nano](#) **2016**, *10*, 8973
27. Wafer-Scale and Wrinkle-Free Epitaxial Growth of Single-Orientated Multilayer Hexagonal Boron Nitride on Sapphire
A. R. Jang, S. Hong, C. Hyun, S. I. Yoon, [G. Kim](#), H. Y. Jeong, T. J. Shin, S. O. Park, K. Wong, S. K. Kwak, N. Park, K. Yu. E. Choi, A. Mishchenko, F. Withers, K. Novoselov, H. Lim*, H. S. Shin*
[Nano Lett.](#) **2016**, *16*, 3360
28. Atomic-Scale Dynamics of Triangular Hole Growth in Monolayer Hexagonal Boron Nitride under Electron Irradiation
G. H. Ryu, H. J. Park, J. Ryou, J. Park, J. Lee, [G. Kim](#), H. S. Shin, C. W. Bielawski, R. S. Ruoff, S. Hong*, Z. Lee*
[Nanoscale](#) **2015**, *7*, 10660
29. Superstructural Defects and Superlattice Domains in Stacked Graphene
J. M. Yuk, H. Y. Jeong, N. Y. Kim, H. J. Park, [G. Kim](#), H. S. Shin, R. S. Ruoff, J. Y. Lee*, Z. Lee*
[Carbon](#) **2014**, *80*, 755
30. Stacking of Two-Dimensional Materials in Lateral and Vertical Directions
H. Lim, S. I. Yoon, [G. Kim](#), A. R. Jang, H. S. Shin*
[Chem. Mater.](#) **2014**, *26*, 4891

31. Reversibly Light-Modulated Dirac Point of Graphene Functionalized with Spiropyran

A. R. Jang, E. K Jeon, D. Kang, **G. Kim**, B. S. Kim, D. J. Kang, H. S. Shin*

ACS Nano **2012**, 6, 9207

Patents (10, 9 domestic + 1 international)

1. 그래핀 양자점 자체 발광 구조체, 이의 제조방법 및 이를 포함하는 발광 소자
신현석, **김광우**, 전석우, 박민수, 10-2071124, 대한민국 (2020/01/21)
2. 적층된 육방정계 질화붕소 박막을 포함하는 연료전지 막전극접합체 및 그 제조방법
신현석, 윤성인, **김광우**, 김태영, 서동준, 10-2070042, 대한민국 (2020/01/20)
3. 육방정계 질화붕소 내부에 형성된 그래핀 양자점 배열 및 그 제조방법, 그를 포함하는 전자 소자
신현석, **김광우**, 10-2027042, 대한민국 (2019/09/24)
4. 그래핀 수소이온 교환막을 포함하는 연료전지 막전극 접합체,
신현석, 윤성인, **김광우**, 김태영, 서동준, 10-1968468, 대한민국 (2019/04/05)
5. 결함 치유한 이차원 물질의 단위자 층 막 연료전지로의 응용,
신현석, 윤성인, **김광우**, 김태영, 서동준, 10-1922605, 대한민국 (2018/11/21)
6. 금속 촉매 입자가 형성된 육방정계 질화붕소 박막을 포함하는 연료전지 막전극 접합체 및 그 제조방법
신현석, 윤성인, **김광우**, 김태영, 서동준, 10-1922643, 대한민국 (2018/11/21)
7. 계면 접합층이 제거된 육방정계 질화붕소 박막층을 포함하는 연료전지 막전극접합체
신현석, 윤성인, **김광우**, 김태영, 서동준, 10-1922636, 대한민국 (2018/11/21)
8. 육방정계 질화붕소 수소이온교환막을 포함하는 연료전지 막전극 접합체 및 그 제조방법
신현석, 윤성인, **김광우**, 김태영, 서동준, 10-1922622, 대한민국 (2018/11/21)
9. FUEL CELL MEMBRANE ELECTRODE ASSEMBLY (MEA) WITH HEXAGONAL BORON NITRIDE THIN FILM AND FABRICATION METHOD THEREOF
신현석, 윤성인, **김광우**, 김태영, 서동준, US Patent No. 15/854,177, 미국 (2017/12/26)
10. 평면내 육방정계 질화붕소층에 그래핀이 삽입된 복합체 제조방법,
신현석, **김광우**, 10-0081945, 대한민국 (2015/06/10)

Personal Information

Name	Gwangwoo Kim
Date of Birth	08-20-1990
Age	33
Sex	Male
Nationality	Korean
Marital Status	Married
Languages Known	English, Korean
Address	Room 505, E8-10 Building, 1 Chungdae-ro, Seowon-gu, Chengju, Chungbuk, 28644, Republic of Korea.
E-mail	kw820@cbnu.ac.kr, kkww820@gmail.com
Mobile No	+82-10-2041-5956 (Korea)

Declaration

I solemnly declare that all the above-mentioned particulars are true to the best of my knowledge and belief and nothing concealed and distorted.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'Gwangwoo Kim', written in a cursive style.

Gwangwoo Kim