

CURRICULUM VITAE

Joon Ha Chang

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PERSONAL INFORMATION

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EDUCATION

2016.03 – 2020.02	Ph.D in Dept. of Materials Science and Engineering, KAIST (Advisor: Prof. Jong Min Yuk)
2014.03 - 2016.02	M.S. in Dept. of Materials Science and Engineering, KAIST (Advisor: Prof. Jeong Yong Lee)
2010.02 - 2014.02	B.S. in Dept. of Materials Science and Engineering, KAIST

PROFESSIONAL EXPERIENCE

2024. 01 – current	Principal Researcher, Research Institute of Industrial Science & Technology
2021. 07 – 2023.12	Senior Researcher, Research Institute of Industrial Science & Technology
2020. 06 – 2021.06	Postdoctoral Researcher, Korea Research Institute of Chemical Technology (Advisor: Dr. Jungdon Suk)
2019. 06 - 2019.11	International exchange student, ShanghaiTech University (Advisor: Prof. Osamu Terasaki)

SCHOLARSHIPS & AWARDS

2019. 06 - 2019. 11	BK 21+ Scholarship of the Ministry of Science and ICT, Republic of Korea
2020. 09 - 2022.02	Fostering Next-generation Researchers Program, National Research Foundation of Korea (NRF), Republic of Korea

THESIS

1. M.S. Thesis: “*In situ* transmission electron microscopy observation of conversion reaction in SnO₂ nanoparticles using graphene liquid cells” (2016) (in English).

Thesis Advisor: Prof. Jeong Yong Lee (KAIST)

2. Ph.D Thesis: “*In situ* transmission electron microscopy of working mechanism in metal oxide anode materials for lithium-ion batteries” (2020) (in English).

Thesis advisor: Prof. Jong Min Yuk (KAIST)

PUBLICATIONS (SCI)

A. First and equally contributed first author papers

1. Kunmo Koo⁺, **Joon Ha Chang⁺**, Sanghyeon Ji⁺, Hyuk Choi, Seunghee Cho, Seung Jo Yoo, Jacob Choe, Hyo San Lee, Sang Won Bae, Jung Min Oh, Hee Suk Woo, Seungmin Shin, Geun-Taek Lee, Tae-Hong Kim, Yeon Sik Jung, Ji-Hwan Kwon, Ju hyeok Lee, Yoon Huh, Sung Kang, Hyun You Kim, Jong Min Yuk*, “Abnormal Silicon Etching Behaviors in Nanometer-Sized Channels”, *Nano Letters*, Accepted. (2024) (equally contributed)
2. **Joon Ha Chang⁺**, Min Wook Pin⁺, Inhye Kim, Sangbeom Kim, Seonho Kim, Sanghyeok Moon, Junhee Cho, Sieun Choi, Boseong Heo, Zubair Ahmed Chandio, Youngjin Kim*, Jun Young Cheong*, Dorcas Zide, Mandisa Madondo, Bernard Jan Bladergroen, Mohamed Eldessuoki, Manuel Martinez Escandell, Hee-Jae Jeon, “Binder migration: frequently observed yet overlooked phenomena in electrode processing for lithium-ion batteries”, *Journal of Energy Storage*, 83, 110729 (2024) (equally contributed)
3. Yongsun Park⁺, **Joon Ha Chang⁺**, Gwang Suk Oh, A-young Kim, Hansen Chang, Mahir Uenal, Sangchul Nam*, and Ohmin Kwon*, “Enhanced Electrochemical Stability and Extended Cycle Life in sulfide-Based All-Solid-State Batteries: The Role of Li₁₀SnP₂S₁₂ Coating on Ni-Rich NCM Cathode”, *Small*, 20, 2305758 (2024) (equally contributed)
4. **Joon Ha Chang**, Min Wook Pin, Rohith K. Ramakrishnan, Jiman Choi, Jaewon Park, Gyeong Min Choi, Jeongsik Yun, Kie Yong Cho, Maneesha Vinodini Ramesh, Vinod V.T Padil*, Jun Young Cheong*, “Gum based functional binder for high-performance artificial graphite anode for lithium-ion batteries”, *Sustainable Chemistry for the Environment*, 2, 100012 (2023)
5. Jun Young Cheong⁺, **Joon Ha Chang⁺**, Jacob Choe, Jong Min Yuk*, Il-Doo Kim*, “Bias-free graphene solid cell to realize the real-time observation on dynamical changes of electrodes”, *Advanced Materials Interfaces*, 2201849, 2022. (equally contributed)
6. **Joon Ha Chang⁺**, Jun Young Cheong⁺, Yoonsu Shim⁺, Jae Yeol Park, Sung Joo Kim, Jiyoung Lee, Ho Jun Lee, Haeseong Lim, Weiyan Liu, Qing Zhang, Osamu Terasaki, Chan-Woo Lee*, Il-Doo Kim*, Jong Min Yuk*, “Unravelling high volumetric capacity of Co₃O₄ nanograins-interconnected secondary particles for lithium-ion battery anode”, *Journal of Materials Chemistry A*, 9, 6242-6251 (2021). (equally contributed)
7. **Joon Ha Chang⁺**, Jun Young Cheong⁺, Sung Joo Kim, Yoon-Su Shim, Jae Yeol Park, Hyeon Kook Seo, Kyun Seong Dae, Chan-Woo Lee, Il-Doo Kim*, Jong Min Yuk*, “Graphene liquid

- cell electron microscopy of initial lithiation in Co_3O_4 nanoparticles”, *ACS Omega* 4, 6784-6788 (2019). (equally contributed) (highlighted in ACS Insights April 2019)
8. Jun Young Cheong⁺, **Joon Ha Chang**⁺, Chanhoo Kim, Jiyoung Lee, Yoon-Su Shim, Seung Jo Yoo, Jong Min Yuk^{*}, and Il-Doo Kim^{*}, “Unveiling the origin of superior electrochemical performance in polycrystalline dense SnO_2 nanospheres as anodes for lithium-ion batteries”, *ACS Applied Energy Materials* 2, 2004-2012 (2019). (equally contributed)
 9. **Joon Ha Chang**⁺, Jun Young Cheong⁺, Hyeon Kook Seo, Il-Doo Kim^{*} and Jong Min Yuk^{*}, “Preparation of Graphene Liquid Cells for the Observation of Lithium-ion Battery Material”, *Journal of Visualized Experiments*, e58676, (2019). (equally contributed) (**Invited Paper**)
 10. Jun Young Cheong⁺, **Joon Ha Chang**⁺, Su-Ho Cho, Ji-Won Jung, Chanhoo Kim, Kyun Seong Dae, Jong Min Yuk^{*}, and Il-Doo Kim^{*}, “High-rate formation cycle of Co_3O_4 nanoparticle for superior electrochemical performance in lithium-ion batteries”, *Electrochimica Acta* 295, 7-13 (2019). (equally contributed)
 11. Jun Young Cheong⁺, **Joon Ha Chang**⁺, Sung Joo Kim, Chanhoo Kim, Hyeon Kook Seo, Jae Won Shin, Jong Min Yuk^{*}, Jeong Yong Lee^{*}, Il-Doo Kim^{*}, “In Situ High-Resolution Transmission Electron Microscopy (TEM) Observation of Sn Nanoparticles on SnO_2 Nanotubes Under Lithiation”, *Microscopy and Microanalysis* 23, 1107-1115 (2017). (equally contributed)
 12. **Joon Ha Chang**⁺, Jun Young Cheong⁺, Jong Min Yuk, Chanhoo Kim, Sung Joo Kim, Hyeon Kook Seo, Il-Doo Kim^{*}, Jeong Yong Lee^{*}, “Direct realization of complete conversion reaction and agglomeration dynamics of SnO_2 nanoparticles in liquid electrolyte”, *ACS Omega* 2, 6329-6336 (2017). (equally contributed) **2017.10.3 published**
 13. Jun Young Cheong⁺, **Joon Ha Chang**⁺, Hyeon Kook Seo, Jong Min Yuk, Jae Won Shin, Jeong Yong Lee^{*}, Il-Doo Kim^{*}, “Growth dynamics of solid electrolyte interphase layer on SnO_2 nanotubes realized by graphene liquid cell electron microscopy”, *Nano Energy* 25, 154-160 (2016). (equally contributed) (**Front Cover Article**)

B. Co-author papers

1. Jinkyu Park⁺, Yoonsu Shim⁺, **Joon Ha Chang**, Se-Hee Kim, Jong Min Yuk, Chan-Woo Lee^{*}, Jungdon Suk^{*}, “Rational Design of Hybrid Electrolyte for All-Solid-State Lithium Battery based on Investigation of Lithium Ion Transport Mechanism”, Submitted (2023).
2. Minwook Pin, Jiman Choi, **Joon Ha Chang**, Hynung Yu, Jun Young Cheong^{*}, “*In situ* X-ray based analysis of anode materials for lithium-ion batteries: current status and future implications”, Under Review. (2023)
3. Yongil Kim⁺, Hyun-seung Kim⁺, Yongjo Jung⁺, **Joon Ha Chang**, Min Wook Pin, Boseong Heo, Sieun Choi, Hee-Jae Jeon, Beom Tak Na, Jun Young Cheong^{*}, Taeho Yoon^{*}, Youngjin Kim^{*}, “Understanding the Capacity Increase Mechanism in MoO_2/C Anodes for Lithium-ion Batteries”, *Journal of Electroanalytical Chemistry*, Accepted. (2024). (equally contributed)
4. Ju Young Cha, Jinseok Hong, Minki Kim, Yongjo Jung, **Joon Ha Chang**, Ju Seong Kim, Seon-Hwa Lee, Kijoo Hong, Seung-Yong Lee^{*}, “Quantification of Single Crystallinity in Single Crystal Cathodes for Lithium-ion Batteries”, *Journal of Materials Chemistry A*, Accepted (2024).
5. Jaewon Park⁺, Jeongsik Yun⁺, Young Je Kwon⁺, Min Jeong Lee, Kaiyun Zhang, **Joon Ha Chang**, Min Wook Pin, Jin Hong Lee, Kie Yong Cho^{*}, “Ultra-thin SiO_2 Nanoparticle Layered

- Separators by Surface Multifunctionalization for Li-Metal Batteries: Highly Enhanced Li-Dendrite Resistance and Thermal Properties”, *Energy Storage Materials* 65, 103135 (2024).
6. Irina A. Ivanishcheva, Aleksandr V. Ivanishchev, Jae-Joong Kim, Young Je Kim, Su-Hyun Lee, **Joon Ha Chang**, Jung-Hoon Song, Sang-Cheol Nam*, “Tailoring the MAX Phase Additive for Enhanced Electrochemical Performance of High Ni Layered Oxide Composite Electrode”, *Journal of Energy Storage* 74, 109379 (2023)
 7. Irina A. Ivanishcheva, Aleksandr V. Ivanishchev, Joon Ha Chang, Jung-Hoon Song, Su-Hyun Lee, Jae-Joong Kim, Young Je Kim, Sang-Cheol Nam*, “Illustration of capacity fading factors on the example of $\text{La}_2(\text{Li}_{0.5}\text{Ni}_{0.5})\text{O}_4$ -modified high Ni layered oxide material, *Batteries & Supercaps* 6, e202200466 (2022).
 8. Sung Joo Kim⁺, Jae Yeol Park⁺, Yoonsu Shim, Donghee Chang, **Joon Ha Chang**, Kyun Seong Dae, Jong Min Yuk*, “Microscopic insight into tin nanoparticle magnesiation”, *ACS Applied Energy Materials* 5, 7944-4949 (2022) (equally contributed)
 9. Dae Kyom Kim⁺, Jin Seul Byun⁺, San Moon, Junyoung Choi, **Joon Ha Chang**, Jungdon Suk*, “Molten salts approach of metal-organic framework-derived nitrogen-doped porous carbon as sulfur host for lithium-sulfur batteries”, *Chemical Engineering Journal* 441, 135945 (2022). (equally contributed)
 10. Jae Yeol Park⁺, Yoonsu Shim⁺, Dao Phuong Khoi⁺, Sang-Gil Lee, Jacob Choe, Ho Jun Lee, Yonghee Lee, Yuseon Choi, **Joon Ha Chang**, Seung Jo Yoo, Chi Won Ahn, Wonyoung Chang, Chan-Woo Lee*, Jong Min Yuk*, “Non-Equilibrium Sodiation Pathway of CuSbS_2 ”, *ACS Nano* 15, 17472-17179 (2021) (equally contributed)
 11. Jungjae Park, Kunmo Koo, Namgyu Noh, **Joon Ha Chang**, Kyun Seong Dae, Ji Su Park, Jun Young Cheong, Il-Doo Kim and Jong Min Yuk*, “Graphene liquid cell electron microscopy: progress, applications, and perspectives”, *ACS Nano* 15, 288-308 (2021). (Invited Review)
 12. Jae Yeol Park, Yoonsu Shim, Yong-il Kim, Jungjae Park, Yuseon Choi, Hojun Lee, Ji Eun Wang, Yonghee Lee, **Joon Ha Chang**, Kang-hoon Yim, Chi Won Ahn, Chan-Woo Lee, Do Kyung Kim, and Jong Min Yuk*, “An iron-doped NASICON type sodium ion battery cathode for enhanced sodium storage performance and its full cell applications”, *Journal of Materials Chemistry A* 8, 20436-20445 (2020).
 13. Kyun Seong Dae, **Joon Ha Chang**, Kunmo Koo, Jungjae Park, Jae Sung Kim, Jong Min Yuk*, “Real-time observation of CaCO_3 mineralization in highly supersaturated graphene liquid cells”, *ACS Omega* 5, 14619-14624 (2020). (Supplementary Journal Cover)
 14. Hyeon Kook Seo⁺, Yoon Hwa⁺, **Joon Ha Chang**, Jae Yeol Park, Jae Sang Lee, Jungjae Park, Elton J. Cairns*, Jong Min Yuk*, “Direct visualization of lithium polysulfides and their suppression in liquid electrolyte”, *Nano Letters* 20, 2080-2086 (2020). (equally contributed)
 15. Hyeon Kook Seo, Jae Yeol Park, **Joon Ha Chang**, Kyun Sung Dae, Myoung-Sub Noh, Sung-Soo Kim, Chong-Yun Kang, Kejie Zhao, Sangtae Kim*, Jong Min Yuk*, “Strong Stress-Composition Coupling in Lithium Alloys”, *Nature Communications* 10, 3428 (2019).
 16. Jae Yeol Park, Sung Joo Kim, Kanghoon Yim, Kyun Seong Dae, Yonghee Lee, Khoi Phuong Dao, Ji Su Park, Han Beom Jeong, **Joon Ha Chang**, Hyeon Kook Seo, Chi Won An, Jong Min Yuk*, “Pulverization-tolerant copper-based metal sulfides for high performance sodium storage”, *Advanced Science* 1900264 (2019). (Inside Cover Article)
 17. Jae Yeol Park⁺, Sung Joo Kim⁺, **Joon Ha Chang**, Hyeon Kook Seo, Jeong Yong Lee*, Jong Min Yuk*, “Atomic visualization of a non-equilibrium sodiation pathway in copper sulfide”, *Nature Communications* 9, 922 (2018). (equally contributed)
 18. Jun Young Cheong, **Joon Ha Chang**, Chanhon Kim, Frank Jaksoni Mweta, Ji-Won Jung, Jeong Yong Lee*, Il-Doo Kim*, “Revisiting on the effect and role of TiO_2 layer thickness on

SnO₂ for enhanced electrochemical performance for lithium-ion batteries”, *Electrochimica Acta* 258, 1140-1148 (2017).

19. Hwea Yoon Kim, Da-Eun Yoon, Junho Jang, Daewon Lee, Gwnag-Mun Choi, **Joon Ha Chang**, Jeong Yong Lee, Doc C Lee*, Byeong-Soo Bae*, “Quantum dot/siloxane composite film exceptionally stable against oxidation under heat and moisture”, *Journal of American Chemical Society* 138, 16478-16485 (2016).

C. Invited Talks and Seminars

1. **Joon Ha Chang**, “*In situ* transmission electron microscopy of Li-ion battery anode materials”, National Nanofab Center (NNFC), Daejeon, Republic of Korea (22 Oct. 2020, Host: Yun Chang Park).
2. **Joon Ha Chang**, “Transmission electron microscopy (TEM) research of Li-ion battery materials”, Sejong University, Seoul, Republic of Korea (03 Mar. 2022, Host: Prof. Sungkyu Kim)
3. **Joon Ha Chang**, “Nanoscale Analysis of Battery and Semiconductor Materials using Transmission Electron Microscopy (TEM)” National Institute of Nanomaterials Technology (NINT), Pohang, Republic of Korea (28 Aug. 2023, Host: Dr. Nam-Suk Lee)
4. **Joon Ha Chang**, “Exploring Lithium-Ion Battery Materials Using Transmission Electron Microscopy (TEM) Techniques”, Pukyong National University, Busan, Republic of Korea (26 Jan. 2024, Host: Prof. Kye Yong Cho)
5. **Joon Ha Chang**, “Investigating Lithium-Ion Battery Materials Through Transmission Electron Microscopy (TEM)”, Incheon National University, Incheon, Republic of Korea (15. Feb. 2024, Host: Prof. Jeongsik Yun)

D. International Conference Proceedings and Extended Abstracts

1. Sanghyeon Ji, Kunmo Koo, **Joon Ha Chang**, Jacob Choe, Jong Min Yuk, “Revealing the impact of confinement width on wet etching by using silicon nano-lines”, The 20th International Microscopy Congress. Busan, Republic of Korea (10 Sep. – 15 Sep. 2023)
2. Ju Young Cha, Jinseok Hong, Yongjo Jung, **Joon Ha Chang**, Kijoo Hong, Seung-Yong Lee, “Quantifying the Single Crystallinity of Single Crystal Cathodes for Lithium-ion Batteries”, The 20th International Microscopy Congress. Busan, Republic of Korea (10 Sep. – 15 Sep. 2023)
3. Kunmo Koo, **Joon Ha Chang**, Sanghyeon Ji, Jacob Choi, Seungmin Shin, Geun-Taek Lee, Tae-Hong Kim, Jong Min Yuk, “Etching Dynamics of Geometrically Confined Silicon Nanostructure”, Microscopy and Microanalysis 2022 Meeting, Portland, Oregon, USA (31 Jul. – 04 Aug. 2022)
4. Jun Young Cheong, **Joon Ha Chang**, Jacob Choe, Jong Min Yuk, Il-Doo Kim, “A Novel *in situ* TEM Platform Without Bias, Nano Korea 2022, KINTEX, Goyang, Korea (06 Jul. - 08. Jul. 2021)
5. Jinkyu Park, **Joon Ha Chang**, Jungdon Suk, “Rational design of hybrid electrolytes for high-voltage all-solid-state lithium battery”, Nano Korea 2021, KINTEX, Goyang, Korea (07 Jul. - 09. Jul. 2021)
6. Jae Yeol Park, **Joon Ha Chang**, Sung Joo Kim, Hyeon Kook Seo, Jong Min Yuk, “Facile *in situ* lithiation and sodiation observation in TEM employing MF (M=Li, Na)”, Microscopy and Microanalysis 2019 Meeting, Portland, Oregon, USA (04 Aug. – 08 Aug. 2019)
7. Kyun Seong Dae, **Joon Ha Chang**, Jae Won Shin, Jong Min Yuk, “Preferential growth of carbon nanotubes via the carbon volume diffusion channels in Fe₃C nanoparticles”, Microscopy and Microanalysis 2018 Meeting, Baltimore, Maryland, USA (05 Aug. – 09 Aug. 2018)
8. **Joon Ha Chang**, Jun Young Cheong, Il-Doo Kim and Jong Min Yuk “In situ transmission electron microscopy of lithiation dynamics in a SnO₂ hollow nanosphere”, Microscopy and Microanalysis 2018 Meeting, Baltimore, Maryland, USA (05 Aug. – 09 Aug. 2018)
9. Jun Young Cheong, **Joon Ha Chang**, Jeong Yong Lee, and Il-Doo Kim “In Situ TEM Observation on the growth of solid electrolyte interphase (SEI) layer on Co₃O₄ upon sodiation and magnesiation using graphene liquid cell”, Microscopy and Microanalysis 2018 Meeting, Baltimore, Maryland, USA (05 Aug. – 09 Aug. 2018)
10. Kyun Seong Dae, **Joon Ha Chang**, Jong Min Yuk, Jeong Yong Lee, “Direct Observation of Calcium Carbonate Precipitation Using *in situ* Liquid Transmission Electron Microscopy”, Microscopy and Microanalysis 2017 Meeting, St. Louis, Missouri, USA (06 Aug. – 10 Aug. 2017)
11. Frank Jaksoni Mweta, **Joon Ha Chang**, Hyeon Kook Seo, Sung Joo Kim, Jun Young Cheong, Il-Doo Kim, Jong Min Yook, Jeong Yong Lee, “In Situ Transmission Electron Microscopy Graphene Liquid Cell on Chemical Sodiation of Nickel Oxide Nanoparticle”, Microscopy and Microanalysis 2017 Meeting, St. Louis, Missouri, USA (06 Aug. – 10 Aug. 2017)
12. Jun Young Cheong, **Joon Ha Chang**, Jong Min Yuk, Jeong Yong Lee, Il-Doo Kim, “The Effect of Electron Beam Dosage in the Decomposition Behavior of Electrolytes Encapsulated Inside the Graphene Sheets Based on In Situ TEM Observation”, Microscopy and Microanalysis 2017 Meeting, St. Louis, Missouri, USA (06 Aug. – 10 Aug. 2017)
13. Jun Young Cheong, **Joon Ha Chang**, Sung Joo Kim, Chanhon Kim, Hyeon Kook Seo, Jae Won Shin, Jong Min Yuk, Jeong Yong Lee, Il-Doo Kim, “In Situ TEM Observation on the

- Agglomeration of Nanoparticles in the Interface of SnO_2 ", Microscopy and Microanalysis 2017 Meeting, St. Louis, Missouri, USA (06 Aug. – 10 Aug. 2017)
14. **Joon Ha Chang**, Jun Young Cheong, Sung Joo Kim, Ji-Won Jung, Chanhoo Kim, Hyeon Kook Seo, Jae Won Shin, Jong Min Yuk, Il-Doo Kim, Jeong Yong Lee, "Real Time Observation of Initial Conversion Reaction of Co_3O_4 Nanoparticles Using Graphene Liquid Cell Electron Microscopy", Microscopy and Microanalysis 2017 Meeting, St. Louis, Missouri, USA (06 Aug. – 10 Aug. 2017)
 15. Sung Joo Kim, Kyun Seong Dae, **Joon Ha Chang**, Jeong Yong Lee, "Mg Insertion into Sn Nanoparticles Observed by In Situ TEM", 2016 MRS Fall Meeting, Boston, Massachusetts, USA (27 Nov. – 02 Dec. 2016)
 16. Jae Yeol Park, **Joon Ha Chang**, Hyeon Kook Seo, Sung Joo Kim, Jeong Yong Lee, "In Situ Observation of Lithiation of Copper (II) Sulfide Hexagonal Nanoparticles – Formation of Copper Dendrite in Displacement Reaction", 2016 MRS Fall Meeting, Boston, Massachusetts, USA (27 Nov. – 02 Dec. 2016)
 17. Jun Young Cheong, **Joon Ha Chang**, Jeong Yong Lee, Il-Doo Kim, "In Situ TEM Study on the Growth Process of Amorphous Layer on SnO_2 Nanoparticle During Sodiation on Real Time Scale", Microscopy and Microanalysis 2016 Meeting, Columbus, Ohio, USA (24 Jul. – 28. Jul. 2016)
 18. **Joon Ha Chang**, Jun Young Cheong, Il-Doo Kim, Jeong Yong Lee, "In Situ TEM Observation on the Growth and Agglomeration of Propylene Carbonate-based Electrolytes During Sodiation with Graphene Liquid Cell", Microscopy and Microanalysis 2016 Meeting, Columbus, Ohio, USA (24 Jul. – 28. Jul. 2016)
 19. **Joon Ha Chang**, Jun Young Cheong, Il-Doo Kim, Jeong Yong Lee, "In Situ TEM Observation on Formation of Uniform Amorphous Layer on SnO_2 Nanotube", Microscopy and Microanalysis 2016 Meeting, Columbus, Ohio, USA (24 Jul. – 28. Jul. 2016)
 20. Frank Jaksoni Mweta, Sung Joo Kim, **Joon Ha Chang**, Jun Young Cheong, Hyeon Kook Seo, Il-Doo Kim, Jeong Yong Lee, "Case Examination on Volume Expansion of Crystalline Si Nanoparticles under Sodiation: In Situ TEM Study Using Graphene Liquid Cells", Microscopy and Microanalysis 2016 Meeting, Columbus, Ohio, USA (24 Jul. – 28. Jul. 2016)
 21. Jun Young Cheong, **Joon Ha Chang**, Jeong Yong Lee, Il-Doo Kim, "Structural Integrity of SnO_2 Nanotubes During Sodiation Examined by in Situ TEM Observation with Graphene Liquid Cell", Microscopy and Microanalysis 2016 Meeting, Columbus, Ohio, USA (24 Jul. – 28. Jul. 2016)
 22. **Joon Ha Chang**, Jun Young Cheong, Sung Joo Kim, Hyeon Kook Seo, Jong Min Yuk, Il-Doo Kim, Jeong Yong Lee, "In Situ Transmission Electron Microscopy Observation of Conversion Reaction in SnO_2 Nanoparticle Using Graphene Liquid Cell", 2016 MRS Spring Meeting, Phoenix, Arizona, USA (26 Mar. - 01 Apr. 2016).

E. Domestic Conferences

1. Jae Deok Kim, Choong Bog Kim, Jun Pil Yoon, Irina A Ivanishcheva, Aleksandr V Ivanishchev, Jae-Joong Kim, Young Je Kim, Su-Hyun Lee, Jung-Hoon Song, Sang-Cheol Nam, Sung Kang, Jungjae Park, Min Wook Pin, **Joon Ha Chang**, "Electron Microscopy Analysis of Functional Coating Materials for Lithium-ion Battery Cathodes", 2024 Spring Meeting of the Korean Electrochemical Society, Busan, Republic of Korea (03 Apr. – 05 Apr. 2024)
2. 장준하, "투과전자현미경을 사용한 리튬이온 배터리 양/음극재 연구", 2022 한국현미경학회 춘계학술대회, 대구, 대한민국 (29. Jun. – 01. Jul. 2022) (Invited Oral Presentation)
3. **Joon Ha Chang**, Jinkyu Park, Jungdon Suk, "TEM specimen preparation of organic/inorganic interface in composite solid electrolyte for all-solid-state Li battery using cryo ultramicrotomy", 2022 한국현미경학회 춘계학술대회, 대구, 대한민국 (29 Jun. – 01. Jul. 2022) (Poster Presentation)
4. 심윤수, 장준하, 정준영, 박재열, 김성주, 이지영, 이호준, 임해성, 이찬우, 김일두, 육종민, "리튬이온전지 음극재를 위한 Co₃O₄ NISP (nanograins-interconnected secondary particles)의 높은 부피 용량의 연구, 2022 년도 대한금속·재료학회 춘계학술대회, 창원, 대한민국 (27. Apr. – 29 Apr. 2022) (Poster Presentation)
5. **Joon Ha Chang**, Jun Young Cheong, Chanhoo Kim, Jiyoung Lee, Yoonsu Shim, Seung Jo Yoo, Moon-Hi Hong, Il-Doo Kim, Jong Min Yuk, "Agglomeration Prevention of SnO₂ Nanosphere Revealed by In Situ Transmission Electron Microscopy", 2021 한국현미경학회 춘계학술대회, 대한민국 (04-05 Nov. 2021) (Poster Presentation)
6. 박재열, 김성주, 장준하, 서현국, 이정용, 육종민, "황화구리의 점진적 결정구조변화를 통한 소듐 저장원리에 관한 연구", 한국 전지학회 2018 년도 춘계학술대회, Daejeon, Korea (24 May. - 25. May. 2018) (Poster Presentation)
7. **Joon Ha Chang**, Jun Young Cheong, Chanhoo Kim, Sung Joo Kim, Hyeon Kook Seo, Il-Doo Kim, Jong Min Yuk, "Observation of conversion reaction of SnO₂ nanoparticles using graphene liquid cells", 한국 전지학회 2018 년도 춘계학술대회, Daejeon, Korea (24 May. - 25. May. 2018) (Poster Presentation)
8. Hyeon Kook Seo, Sangtae Kim, Jae Yeol Park, **Joon Ha Chang**, Sung Joo Kim, Jae Won Shin, and Jong Min Yuk, "Mechanical stress effects on the lithiation behavior of tin nanoparticles revealed by in situ graphene liquid cell transmission electron microscopy", The 3rd East-Asia Microscopy conference, EAMC3, Bexco, Busan, Korea (07 Nov. - 10 Nov. 2017). (Oral Presentation)
9. 정준영, 장준하, 서현국, 정지원, 김찬훈, 이정용, 김일두, "Ultra-fast kinetics of initial conversion reaction onset in Co₃O₄ nanoparticles under lithiation revealed by graphene liquid cell electron microscopy", 2016 년 한국세라믹 학회 춘계학술대회, Jeju, Korea, (23 Nov. - 25 Nov. 2016). (Oral Presentation)
10. 정준영, 장준하, 김성주, 김찬훈, 서현국, 신재원, 이정용, 김일두, "In Situ High Resolution TEM Observation of Hemispherical Sn Nanoparticles in the Surface of SnO₂ Nanotubes in Liquid Electrolyte during Lithiation." 2016 년 한국세라믹 학회 춘계학술대회, Jeju, Korea, (23 Nov. - 25 Nov. 2016). (Oral Presentation)
11. 정준영, Frank Jaksoni Mweta, 장준하, 김찬훈, 이정용, 김일두, "Probing the Critical Thickness and Role of TiO₂ Overlayer on SnO₂ in improving the electrochemical performance

of Lithium-ion Batteries", 2016 년 한국세라믹 학회 춘계 학술대회, Busan, Korea, (20 Apr. - 22 Apr. 2016). (Oral Presentation)