Il-Kwon Oh

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Electrical and Computer Engineering, Ajou University
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Research Interests

Prof. Oh's current research interests and topics are focused on **fabricating emerging electronic devices** with nanostructured materials and especially, cover wide range of semiconductor fields; 1) the fabrication and evaluation of electronic devices including in **semiconductor/memory devices**, 2) the fabrication and elucidating of new concepts of electronic devices with **novel nanostructures by controlling surface chemical reaction**.

Highlights

Education: B.S and Ph.D. EE at Yonsei ('16)
Research Experience: Postdocs at Yonsei, Korea ('16-'18) and at Stanford, USA ('18~)
Papers: 55 published, 2 under review, 1 submitted (1005 citations, 18 h-index)
Patents: 19 granted patents (4 international), 29 pending patents (9 international)
Reward and honors: 8 fellowship and honors, 1 technology transfer experience
Conference: 5 invited conference talks, 57 contributed conference talks
Lectures: 28 invited lectures
Projects: 22 research projects
Others: 6 teaching activities, 6 consulting activities

Bio & Research Backgrounds (clickable links below)

Education | Research Experiences | Technology Transfer | Fellowship and Honors
Technical Skills | Journal Articles | Journal Review Experiences | Patents
Conference Presentations | Teaching Activities | Invited Lectures | Consulting Activities
Research Projects | References

Education

- Master's and Doctoral programs in Electrical and Electronic Engineering in School of Yonsei University
  - Period: 3/2012 – 8/2016
  - Advisor: Professor Hyungjun Kim
  - Thesis: Rare earth oxides atomic layer deposition for high-k dielectrics and hydrophobic coatings
- B.S. in School of Electrical and Electronics Engineering, Yonsei University, Korea
  - Period: 3/2007 - 2/2012

Research Experiences

- Assistant Profession, Electrical and Computer Engineering, Ajou University
  - Period: 3/2021 – present
- Postdoctoral scholar, Department of Chemical Engineering, Stanford University
  - Period: 10/2018 – 2/2021
  - Fund: SRC New Limits Center
  - PI: Professor Stacey F. Bent
  - Research area: Nanostructures fabricated by atomic layer deposition for semiconductor devices
- Postdoctoral researcher, School of Electrical and Electronic Engineering, Yonsei University
  - Period: 9/2016 – 8/2018
  - Fund: Yonsei Supporting Business for Postdoctoral Researcher
  - PI: Professor Hyungjun Kim
  - Research area: Electronic devices with atomic layer deposition of metal oxides for future semiconductor/memory applications
- Head of ITU-Yonsei Joint Research Center, Nanodevice Laboratory, Yonsei University
  - Period: 1/2017 – 8/2018
  - Fund: ITECHU (ALD Equipment Company)
  - Research area: Consultant on the equipment for atomic layer deposition and chemical vapor deposition and the development of metal oxide, metal, and 2D material processes
- Research assistant, School of Electrical and Electronic Engineering, Yonsei University
  - Period: 3/2012 – 8/2016
  - Academic advisor: Professor Hyungjun Kim
  - Research area: Atomic layer deposition for semiconductor applications
- Undergraduate researcher, School of Electrical and Electronic Engineering, Yonsei University
  - Period: 2/2011 – 2/2012
  - Academic advisor: Professor Hyungjun Kim
  - Research area: Nanolaminates growth by atomic layer deposition for high-k dielectrics

Technology Transfer Experiences

- Know-how technology transfer to SKHynix
  - Title: Development of New Concept of Octuple Patterning Technology Process Based on Hard Mask for Sub-7 nm Multi-Patterning Process of 3D NAND flash devices
  - Technology transfer company: SKHynix

- Technology transfer price: $50,000
- Date: 2017/10/11

Fellowship and Honors

- Post-doctor fellowship, School of Electrical and Electronic Engineering, Yonsei University, (Reward $20,000)
  - Period: 9/2017 - 8/2018
  - Fund: Research Affairs/University Industry Foundation, Yonsei University
  - Research area: Surface-energy-control-based ALD REO thin films for printed electronics
- **Grand Prize (the first place) of the 1st Semiconductor Open Innovation Contest** Sponsored by SKHynix, 10/11/2017 (Reward $50,000)
  - Title: Development of New Concept of Octuple Patterning Technology Process Based on Hard Mask for Sub-7 nm Multi-Patterning Process of 3D NAND Flash Devices
  - Presenter: Sungwook Park (President of SKHynix)
  - Press: The JoongAng Ilbo: http://news.joins.com/article/22003820
- Best Paper Award, Materials Research Society of Korea, 05/18/2017
  - Title: The investigation on AS-ALD Al_2O_3 nano thin films and reaction mechanism
- Best Paper Award, Materials Research Society of Korea, 11/18/2016
  - Title: Improvement of plasma damage by using VHF plasma source during PE-ALD
- Post-doctor fellowship, School of Electrical and Electronic Engineering, Yonsei University, (Reward $20,000)
  - Period: 9/2016 - 8/2017
  - Fund: Research Affairs/University Industry Foundation, Yonsei University
  - Research area: Surface-energy-control-based REO membrane for water solution
- Best Paper Award, Korean Crystallographic Association, 11/06/2015
  - Title: Transformation of crystalline phase of HfO_2 by Er doping
- Best Paper Award, The Korean Institute of Metals and Materials, 10/28/2015
  - Title: Analysis of film properties of Sputter Al with varying process parameters and film thickness
- The 9th Korea Semiconductor Fellowship Sponsored by Applied Materials Korea and Korea Semiconductor Industry Association, 9/2014 (Reward $10,000)
  - Presenter: Yongjin Kim (President of Applied Materials Korea)

Technical Skills

- Device fabrication
  - Thin film deposition techniques including in atomic layer deposition, chemical vapor deposition, sputter, evaporator, spin-coater, hydrothermal deposition, etc.
  - Rapid thermal annealing (annealing, oxidation, and reduction processes)
  - Patterning devices by photolithography and e-beam lithography
  - Wet chemical etching, reactive ion etching, and atomic layer etching
  - Fabrication of thin film transistor (TFT), metal-oxide-semiconductor (MOS), metal-insulator-metal (MIM) capacitors, complementary MOS amplifier/inverter, MOS field effect transistor (FET), etc. for emerging devices including in memory devices such as resistive random access memory (RRAM), phase-change RAM (PRAM), NAND flash memory and dynamic RAM (DRAM), sensors, solar devices, photodiodes, etc.

- Electrical property measurement:
  - Capacitance-voltage (CV) and current-voltage (IV) measurements
  - Evaluation of trap charges inside films by measuring conductance and energy level of traps inside bandgap by elevated measuring temperatures
  - Four-point probe measurement for thin film resistivity
  - Transfer and output curves measurements for thin film transistor characterization
  - Reliability testing of devices (under electrical, chemical, and mechanical stress dependent with temperature and illumination)
  - Photocurrent measurement at various environments
  - Measurement of hydrogen evolution reaction and oxygen reduction reaction
  - Gas sensing property measurement with the ambient flow of specific gases
- Thin film deposition equipment
  - Extensive experience with the design, construction, and film growth in atomic layer deposition
  - Professional experience on selective deposition of nanopatterns especially for electronic devices
  - Nanoscale film depositions by sputtering and evaporation
  - Surface treatment and modification by using plasma or coating monolayer
  - Handling of toxic gases and safety system (design and construction of scrubber and gas lines)
- Thin film analysis
  - Transmission electron microscope imaging technique with energy dispersive spectroscopy and electron energy loss spectroscopy analyses
  - X-ray diffraction, synchrotron radiation X-ray diffraction and X-ray reflectivity with simulation
  - Grazing wide angle X-ray scattering and grazing small angle X-ray scattering
  - Scanning electron microscopy with energy dispersive spectroscopy
  - Design and construction of in-situ surface analysis equipment using quadruple mass spectroscopy
  - Atomic force microscopy and roughness analyses
  - Secondary ion mass spectroscopy for depth profile analysis
  - Rutherford backscattering and simulation for depth profile analysis
  - X-ray photoelectron spectroscopy for chemical qualification and quantification analyses
  - Auger electron spectroscopy for depth profile and area mapping analyses
  - Surface contact angle measurement for hydrophobicity analysis
- Software tools:
  - Mathematica for calculation and fitting data
  - Nanoparticle analysis using computational method (ImageJ, Gatan Microscope)
  - LabVIEW for control of equipment
  - Software to analyze the results from synchrotron X-ray source
  - Mathlab for Monte Carlo simulation
  - Visualization for specific figures using computational method (Photoshop, Rhino, Keyshot)
- Deposition tools:
  - Fabrication of tools based on vacuum such as atomic layer deposition and chemical vapor deposition

Journal Articles

Selected (Recent 5 Years as a Main Author, IF>7)

- **ACS nano (IF: 14.588)** "Homemade superhydrophobic surfaces from dinner table supplies driven by biscuit-dunking physics " (2020) under review [Corresponding Author]
- **ACS nano (IF: 14.588)** "Synthesis of a hybrid nanostructure of ZnO-decorated MoS_2-nanowires by atomic layer deposition" (2020) [First Author]
  https://dx.doi.org/10.1021/acsnano.9b07467
- **ACS nano (IF: 14.588**) "Surface Energy Change of Atomic-scale Metal Oxide Thin Films by Phase Transformation" (2020) [First Author]
  https://doi.org/10.1021/acsnano.9b07430
- **Chemistry of Materials (IF: 9.567),** "Reaction mechanism of atomic layer deposition of Pt on various textile surfaces" (2019) [First Author]
  https://doi.org/10.1021/acs.chemmater.9b03171
- **Chemistry of Materials (IF: 9.567),** "Water-erasable memory device for security applications prepared by the atomic layer deposition of GeO_2" (2018) [First Author]
  http://pubs.acs.org/doi/10.1021/acs.chemmater.7b04371
- **2D Materials (IF: 7.343)** "Bi-layer high-k dielectrics of Al_2O_3/ZrO_2 to reduce damage to MoS_2 channel layers during atomic layer deposition" (2018) [First Author]
  https://doi.org/10.1088/2053-1583/aaef1e
- **Journal of Material Chemistry C (IF: 7.059)** "Simultaneous improvement of dielectric constant and leakage currents of ZrO_2 dielectrics by incorporating highly-valent Ta^{5+} element" (2018) [First Author] https://doi.org/10.1039/C8TC03640C
- **Journal of Material Chemistry C (IF: 7.059)** "Comparative study on growth characteristics and electrical properties of HfO_2 using halide and metal amide precursor grown by atomic layer deposition" (2018) [First Author]
  http://doi.org/10.1039/C8TC01476K
- **ACS Applied Materials and Interfaces (IF: 8.758),** "Reaction mechanism of AS-ALD process for Al_2O_3 nanopatterns" (2017) [Corresponding Author] https://doi.org/10.1021/acsami.7b13365
- **Journal of Materials Chemistry C (Cover, IF: 7.059)**, "*In situ* surface cleaning on a Ge substrate using TMA and $MgCp_2$ for HfO_2-based gate oxides" (2016) [First Author]
  http://dx.doi.org/10.1039/c4tc02686a
- **Chemistry of Materials (IF: 9.567)**, "Nucleation and growth of the HfO_2 dielectric layer for graphene-based devices", (2015) [First Author]
  http://dx.doi.org/10.1021/acs.chemmater.5b01226
- **Chemistry of Materials (IF: 9.567)**, "Hydrophobicity of rare earth oxides grown by atomic layer deposition" (2015) [First Author]
  http://dx.doi.org/10.1021/cm503659d

SCI & SCIE (1005 citations, 18 h-index, 26 i10-index)

1. "Growth mechanism and electrical properties of tungsten films deposited by plasma-enhanced atomic layer deposition with chloride and metal organic precursors", Yujin Lee, Seunggi Seo, Taewook Nam, Hyunho Lee, Hwi Yoon, Sangkyu Sun, **Il-Kwon Oh**, Sanghun Lee, Jin Hyung Seo, Jang Hyeon Seok, Hyungjun Kim submitted to **Journal of Materials Chemistry C** [Co-author]
2. "Homemade superhydrophobic surfaces from dinner table supplies Driven by Biscuit-Dunking Physics", Sumaira Yasmeen, Jaehong Yoon, Sangwoo Shin, **Il-Kwon Oh***, Han-Bo-Ram Lee*, under revision to **Langmuir** [Corresponding author]
3. "The role of precursor design on area-selective atomic layer deposition", **Il-Kwon Oh**, Tania Sandoval, Tzu-Ling Liu, Nathan Richey, Stacey F. Bent under revision **Chemistry of Materials** [First author]
4. "Area-selective molecular layer deposition of silicon oxycarbide low-k dielectric" Xiaoyun Yu, Dara A Bobb Semple, Tzu-Ling Liu, **Il-Kwon Oh,** Stacey F. Bent, Accepted, **Chemistry of Materials** (2021 Feb) 33, 3, 902-909 [Co-author] https://doi.org/10.1021/acs.chemmater.0c03668
5. "MoS_2 doping by atomic layer deposition of high-k dielectrics using alcohol as process oxidants", Whang Je Woo, Seunggi Seo, Taewook Nam, Youngjun Kim, Donghyun Kim, Jeong-Gyu Song, **Il-Kwon Oh**, Jun-Hyung Lim, Hyung-Jun Kim, Hyungjun Kim, **Applied Surface Science** (2020 Nov) 541, 1, 148504 [Co-author] https://doi.org/10.1016/j.apsusc.2020.148504
6. "Kinetics-driven atomic layer deposition of MoS_2 thin films", Li Zeng, Maimaiti Yasheng, Nathaniel E. Richey, David W. Palm, **Il-Kwon Oh**, Jingwei Shi, Callisto MacIsaac, Thomas Jaramillo, Stacey F. Bent, **Journal of Vacuum Science and Technology A** (2020 Nov) 38, 060403 [Co-author] https://doi.org/10.1116/6.0000641
7. "Improved interface quality of atomic-layer-deposited ZrO_2 metal-insulator-metal capacitors with Ru bottom electrodes", Jaehwan Lee, Bo-Eun Park, David Thompson, **Il-Kwon Oh***, Woo-Hee Kim*, Hyungjun Kim*, **Thin Solid Films** (2020 May) 701, 1, 137950 [Corresponding author] https://doi.org/10.1016/j.tsf.2020.137950

9. "Synthesis of a hybrid nanostructure of ZnO-decorated MoS_2-nanowires by atomic layer deposition", **Il-Kwon Oh**, Woo-Hee Kim, Li Zeng, Joseph Singh, Dowon Bae, Adriaan J. M. Mackus, Jung-Gyu Song, Seunggi Seo, Bonggeun Shong, Hyungjun Kim, and Stacey F. Bent, **ACS nano** (2020 Jan) 14, 2, 1757-1769, [First author] https://dx.doi.org/10.1021/acsnano.9b07467
10. "Surface Energy Change of Atomic-scale Metal Oxide Thin Films by Phase Transformation", **Il-Kwon Oh**, Li Zeng, Jae-Eun Kim, Jong-Seo Park, Kangsik Kim, Hyunsoo Lee, Seunggi Seo, Mohamed Rizwan Khan, Sangmo Kim, Chung Wung Park, Junghoon Lee, Bonggeun Shong, Zonghoon Lee, Stacey F. Bent, Hyungjun Kim, Jeong Young Park, and Han-Bo-Ram Lee, **ACS nano** (2020 Jan) 14, 1, 676-687 [First author] https://doi.org/10.1021/acsnano.9b07430
11. "Reaction mechanism of atomic layer deposition of Pt on various textile surfaces", **Il-Kwon Oh**, Jong Seo Park, Rizwan Khan, Kangsik Kim, Hyungjun Kim, Bonggeun Shong, Zonghoon Lee, Han-Bo-Ram Lee, **Chemistry of Materials** 31, 8995-9002 (2019 Oct), https://doi.org/10.1021/acs.chemmater.9b03171 [First author]
12. "Atomic layer deposition of Pt thin films using dimethyl(N,N-dimethyl-3-buten-1-amine-N) platinum and O_2 reactant", WooJae Lee, Zhixin Wan, Chang-Min Kim, **Il-Kwon Oh**, Ryosuke Harada, Suzuki Kazuhara, Se-Hun Kwon, **Chemistry of Materials** (2019 July), 31, 14, 5056-5064 https://doi.org/10.1021/acs.chemmater.9b00675 [Co-author]
13. "Effects of O_2 plasma treatment on moisture barrier property of SiO_2 grown by plasma-enhanced atomic layer deposition", Yujin Lee, Seunggi Seo, **Il-Kwon Oh**, Sanghun Lee, Hyungjun Kim, **Ceramics International** (2019 Jun), 45, 14, 17662-17668 https://doi.org/10.1016/j.ceramint.2019.05.332 [Co-author]
14. "Hydrogen barrier performance of sputtered La_2O_3 films for InGaZnO thin film transistor",Yujin Lee, Chong Hwon Lee, Taewook Nam, Sanghun Lee, **Il-Kwon Oh**, Joon Young Yang, Dong Wook Choi, Choongkeun Yoo, Ho-jin Kim, Woo-Hee Kim, Hyungjun Kim, **Journal of Material Science** 54, 16, 11145–11156 (2019 May), https://doi.org/10.1007/s10853-019-03685-4 [Co-author]

15. "Analysis of defect recovery in reduced graphene oxide and its application as a heater for self-healing polymers", Hyun Gu Kim, **Il-Kwon Oh**, Seungmin Lee, Sera Jeon, Hyunyong Choi, Kwanpyo Kim, Joo Ho Yang, Jae Woo Chung, Jaekwang Lee, Woo-Hee, Kim, Han-Bo-Ram Lee, **ACS Applied Materials and Interfaces** 11, 16804-16814 (2019 Apr), https://doi.org/10.1021/acsami.8b19955 [Co-author]
16. "Effects of Ar addition to O_2 plasma in plasma-enhanced atomic layer deposition of oxide thin films" (Cover aritcle), Hanearl Jung, **Il-Kwon Oh**, Chang Mo Yoon, Bo-Eun Park, Sang Hun Lee, Ohyung Kwon, Se-Hun Kwon, Woo-Hee Kim, Hyungjun Kim, **ACS Applied Materials and Interfaces**, 10, 46, 40286-40293 (2018 Oct) https://pubs.acs.org/doi/10.1021/acsami.8b14244 [Co-author]
17. "Area-selective atomic layer deposition using Si precursors as inhibitors", Rizwan Khan, Bonggeun Shong, Byeong Guk Ko, Jae Kwang Lee, Hyunsoo Lee, Jeong Young Park, **Il-Kwon Oh**, Shimeles Shumi Raya, Hyun Min Hong, Kwun-Bum Chung, Erik J. Luber, Yoon-Seok Kim, Chul-Ho Lee, Woo-Hee Kim, Han-Bo-Ram Lee, **Chemistry of Materials**, 30, 21, 7603-7610 (2018 Oct) https://doi.org/10.1021/acs.chemmater.8b02774 [Co-author]
18. "Bi-layer high-k dielectrics of Al_2O_3/ZrO_2 to reduce damage to MoS_2 channel layers during atomic layer deposition", Whang Je Woo[+], **Il-Kwon Oh[+]**, Jeong-Gyu, Hanearl Jung, Bo-Eun Park, Jongseo Park, Kyunam Park, Hyungjun Kim, **2D Materials** 6, 015019 (2018, Nov) https://doi.org/10.1088/2053-1583/aaef1e [First author]
19. "Simultaneous improvement of dielectric constant and leakage currents of ZrO_2 dielectrics by incorporating highly-valent Ta^{5+} element", Bo-Eun Park[+], **Il-Kwon Oh[+]**, Jong Seo Park, Seunggi Seo, David Thompson, Hyungjun Kim, **Journal of Material Chemistry C**, 6, 9794-9801 (2018, Sep) https://doi.org/10.1039/C8TC03640C [First author]
20. "Structural and electrical properties of Ge-doped ZrO_2 thin films grown by atomic layer deposition for high-k dielectrics", Bo-Eun Park[+], Yujin Lee[+], **Il-Kwon Oh[+]**, Wontae Noh, Satoko Gatineau, Hyungjun Kim, **Journal of Materials Science**, 53(21), 15237-15245 (2018 Aug) https://doi.org/10.1007/s10853-018-2695-4 [First author]
21. "Comparative study on growth characteristics and electrical properties of HfO_2 using halide and metal amide precursor grown by atomic layer deposition", **Il-Kwon Oh**, Bo-Eun Park, Jukka Tanskanen, Han-Bo-Ram Lee, and Hyungjun Kim, **Journal of Materials Chemistry C**, 6, 7367-7376 (2018 Jun) http://doi.org/10.1039/C8TC01476K [First author]
22. "Amorphous TiO_2/p-Si heterojunction photodiode prepared by low-temperature atomic layer deposition", Jaehong Yoon, Rizwan Khan, **Il-Kwon Oh**, Hyungjun Kim, Han-Bo-Ram Lee, **Nanoscience and Nanotechnology Letters**, 10, 800–804 (2018 May), https://doi.org/10.1166/nnl.2018.2638 [Co-author]
23. "High-performance ink-synthesized Cu-gate thin-film transistor with diffusion barrier formation", Whang Je Woo, Taewook Nam, Il-Kwon Oh, Wanjoo Maeng, Hyungjun Kim, **Metals and Materials International**, 24, 652-656 (2018 Feb) https://doi.org/10.1007/s12540-018-0045-3 [Co-author]
24. "Water-erasable memory device for security applications prepared by the atomic layer deposition of GeO_2", Chang Mo Yoon[+], **Il-Kwon Oh[+],** Yoo-Jin Lee, Bo-Eun Park, Change Wan Lee, Cristian Dussarrat , Bonggeun Shong, Hyungjun Kim, and Han-Bo-Ram Lee, **Chemistry of Materials**, 30(3), 830-840 (2018 Jan) http://pubs.acs.org/doi/10.1021/acs.chemmater.7b04371 [First author]
25. "Enhanced light stability of InGaZnO thin-film transistors by atomic-layer-deposited Y_2O_3 with ozone", Hanearl Jung, Woo-Hee Kim, Bo-Eun Park, Whang Je Woo, **Il-Kwon Oh**, Su Jeong Lee, Yun Cheol Kim, Jae-Min Myoung, Satoko Gatineau, Christian Dussarrat, Hyungjun Kim, **ACS Applied Materials and Interfaces**, 10, 2143–2150 (2017 Dec) https://doi.org/10.1021/acsami.7b14260 [Co-author]
26. "Reaction mechanism of AS-ALD process for Al_2O_3 nanopatterns", Seunggi Seo, Byung Chul Yeo, Sang Soo Han, Hanearl Jung, Taewook Nam, Chang Mo Yoon, Youngwoong Moon, Jonggeun Yoon, Choongkeun Yoo, Ho-jin Kim, Yong-back Lee, Su Jeong Lee, Jae-Min Myoung, Han-Bo-Ram Lee and **Il-Kwon Oh***, Hyungjun Kim*, **ACS Applied Materials and Interfaces**, 9, 41607–41617 (2017 Nov) https://doi.org/10.1021/acsami.7b13365 [Corresponding author]

27. "Catalytic chemical vapor deposition of large-area uniform two-dimensional molybdenum disulfide using sodium chloride", Jeong-Gyu Song, **Il-Kwon Oh**, Hanearl Jung, Changwan Lee, Jusang Park, Han-Bo-Ram Lee and Hyungjun Kim, **Nanotechnology**, 28, 465103 (2017 Oct) https://doi.org/10.1088/1361-6528/aa8f15 [Co-author]
28. "Atomic-scale characterization of plasma-induced damage in plasma-enhanced atomic layer deposition", Kangsik Kim, **Il-Kwon Oh**, Hyungjun Kim, Zonghun Lee **Applied Surface Science**, 425, 781-787 (2017July) https://doi.org/10.1016/j.apsusc.2017.06.241 [Co-author]
29. "Atomic layer deposition of Y-stabilized ZrO_2 for advanced DRAM capacitors", Bo-Eun Park⁺, **Il-Kwon Oh⁺,** Chandreswar Mahata, Chang Wan Lee, David Thompson, Han-Bo-Ram Lee, Wan Joo Maeng, and Hyungjun Kim, **Journal of Alloys and Compounds**, 722, 307-312 (2017 Jun) https://doi.org/10.1016/j.jallcom.2017.06.036 [First author]
30. "Comparative study on growth characteristics and electrical properties of ZrO_2 films grown using pulsed plasma-enhanced chemical vapor deposition and plasma-enhanced atomic layer deposition for oxide thin film transistors", Hanearl Jung, **Il-Kwon Oh⁺**, Seungmin Yeo, Su Jeong Lee, Yun Cheol Kim, Jae-Min Myoung, Soo-Hyun Kim, and Hyungjun Kim, **Journal of Vacuum Science & Technology A** 35, 031510 (2017 Apr) http://dx.doi.org/10.1116/1.4982224 [First author]
31. "A composite layer of atomic-layer-deposited AlO_3 and graphene for flexible moisture barrier", Taewook Nam, Youngju Park, **Il-Kwon Oh**, Jong-Hyun Ahn, Sung Min Cho, Hyungjun Kim, Han-Bo-Ram Lee, **Carbon** 116, 553-561 (2017 Feb) http://dx.doi.org/10.1016/j.carbon.2017.02.023 [Co-author]
32. "Growth mechanism of Co thin films formed by plasma-enhanced atomic layer deposition using NH_3 as plasma reactant", **Il-Kwon Oh**, Hyungjun Kim, Han-Bo-Ram Lee, **Current Applied Physics** 17, 333-338 (2016 Dec) http://dx.doi.org/10.1016/j.cap.2016.12.021 [First author]
33. "Bending stability of flexible amorphous IGZO thin film transistors with transparent IZO/Ag/IZO oxide–metal–oxide electrodes", Yun Cheol Kim, Su Jeong Lee, Sang Hoon Lee, **Il-Kwon Oh**, Seunggi Seo, Hyungjun Kim, Jae-Min Myoung, **Journal of Alloys and Compounds** 688, 1108-1114 (2016 Dec) http://dx.doi.org/10.1016/j.jallcom.2016.07.169 [Co-author]
34. "Very high frequency plasma reactant for atomic layer deposition," **Il-Kwon Oh**, Gilsang Yoo, Chang Mo Yoon, Tae Hyung Kim, Geun Young Yeom, Kangsik Kim, Zonghoon Lee, Hanearl Jung, Changwan Lee, Hyungjun Kim, Han-Bo-Ram Lee, **Applied Surface Science** 387, 109–117 (2016 Nov) http://dx.doi.org/10.1016/j.apsusc.2016.06.048 [First author]
35. "Flexible electronics: highly flexible hybrid CMOS inverter based on Si nanomembrane and molybdenum disulfide", Tanmoy Das, Xiang Chen, Houk Jang, **Il-Kwon Oh**, Hyungjun Kim, Jong-Hyun Ahn **Small** 12, 5650-5650 (2016 Nov) http://dx.doi.org/10.1002/smll.201670211 [Co-author]
36. "Highly flexible hybrid CMOS inverter based on Si nanomembrane and molybdenum disulfide", Tanmoy Das, Xiang Chen, Houk Jang, **Il-Kwon Oh**, Hyungjun Kim, Jong-Hyun Ahn **Small** 12, 5720-5727 (2016 Sep) http://dx.doi.org/10.1002/smll.201602101 [Co-author]
37. "Effect of Al_2O_3 deposition on performance of top-gated monolayer MoS_2 based field effect transistor", Jeong-Gyu Song, Seok Jin Kim, Whang Je Woo, Youngjun Kim, **Il-Kwon Oh**, Gyeong Hee Ryu, Zonghoon Lee, Jun Hyung Lim, Jusang Park, Hyungjun Kim, **ACS Applied Materials and Interfaces** 8, 28130-28135 (2016 Sep) http://dx.doi.org/10.1021/acsami.6b07271 [Co-author]
38. "Film properties of Al thin films depending on process parameters and film thickness grown by sputter", **Il-Kwon Oh**, Chang Mo Yoon, Jin Wook Jang, Hyungjun Kim, **Korea Journal of Materials Research** 26, 438-443 (2016 July) https://doi.org/10.3740/MRSK.2016.26.8.438 [First author]
39. "Atomic layer deposition of HfO_2 on graphene through controlled ion beam treatment", Ki Seok Kim, **Il-Kwon Oh**, Hanearl Jung, Hyungjun Kim, Geun Young Yeom, Kyong Nam Kim, **Applied Physics Letters** 108, 213102 (2016 May) http://dx.doi.org/10.1063/1.4950997 [Co-author]
40. "Effects of TaN diffusion barrier on Cu gate ZnO:N thin film transistors", Whang Je Woo, Taewook Nam, Hanearl Jung, **Il-Kwon Oh**, Wanjoo Maeng, Hyungjun Kim, **IEEE Electron Device Letters** 37, 599-602 (2016 May) http://dx.doi.org/10.1109/LED.2016.2549035 [Co-author]

41. "Surface treatment process applicable to next generation graphene-based electronics", Ki Seok Kim, **Il-Kwon Oh**, Hyo-Ki Hong, Hanearl Jung, Hyungjun Kim, Zonghoon Lee, Kyong Nam Kim, Geun-Young Yeom **Carbon** 104, 119–124 (2016 Mar) http://dx.doi.org/10.1016/j.carbon.2016.03.054 [Co-author]
42. "Effects of Cl-based ligand structures on atomic layer deposited HfO_2," Bo-Eun Park⁺, **Il-Kwon Oh⁺**, Chang Wan Lee, Gyeongho Lee, Young-Han Shin, Clement Lansalot-Matras, Wontae Noh, Hyungjun Kim, Han-Bo-Ram Lee, **Journal of Physical Chemistry C** 120, 5958-5967 (2016 Mar) http://dx.doi.org/10.1021/acs.jpcc.5b05286 [First author]
43. "Growth characteristics and electrical properties of SiO_2 thin films prepared by plasma-enhanced atomic layer deposition and chemical vapor deposition using aminosilane precursor," Hanearl Jung, **Il-Kwon Oh**, Chang-Wan Lee, Clement Lansalot-Matras, Soo Jeong Lee, Jae-Min Myoung, Woo-Hee Kim, Hyungjun Kim, **Journal of Materials Science** 51, 5082–5091 (2016 Feb) http://dx.doi.org/10.1007/s10853-016-9811-0 [Co-author]
44. "Static and dynamic performance of complementary inverters based on nanosheet α-$MoTe_2$ p-channel and MoS_2 n-channel transistors," Atiye Pezeshki, Seyed Hossein Hosseini Shokouh, Pyo Jin Jeon, Iman Shackery, Jin Sung Kim, **Il-Kwon Oh**, Seong Chan Jun, Hyungjun Kim, Seongil Im, **ACS Nano** 10, 1118–1125 (2015 Dec) http://dx.doi.org/10.1021/acsnano.5b06419 [Co-author]
45. "Hydrophobicity of rare earth oxides grown by atomic layer deposition", **Il-Kwon Oh**, Kangsik Kim, Zonghoon Lee, Kyung Yong Ko, Chang-Wan Lee, Su Jeong Lee, Jae Min Myung, Clement Lansalot-Matras, Wontae Noh, Christian Dussarrat, Hyungjun Kim, Han-Bo-Ram Lee, **Chemistry of Materials** 27, 148-156 (2015 Dec) http://dx.doi.org/10.1021/cm503659d [First author]
46. "The impact of atomic layer deposited SiO_2 passivation for high-k $Ta_{1-x}Zr_xO$ on the InP substrate", Chandreswar Mahata, **Il-Kwon Oh**, Chang Mo Yoon, Chang Wan Lee, Jungmok Seo, Hassan Algadi, Mi-Hyang Sheen, Young-Woon Kim, Hyungjun Kim, Taeyoon Lee, **Journal of Materials Chemistry C** 3, 10293-10301 (2015 Sep) http://dx.doi.org/10.1039/C5TC01890K [Co-author]
47. "Nucleation and growth of the HfO_2 dielectric layer for graphene-based devices," **Il-Kwon Oh**, Han-earl Jung, Kangsik Kim, Mi Jin Lee, Zonghoon Lee, Seung-Ki Lee, Jong-Hyun Ahn, Changwan Lee, Clement Lansalot-Matras, Jukka Tanskanen, Hyungjun Kim, Han-Bo-Ram Lee, **Chemistry of Materials** 27, 5868–5877 (2015 Aug) http://dx.doi.org/10.1021/acs.chemmater.5b01226 [First author]
48. "Characterization of HfO_xN_y thin film formation by in-situ plasma enhanced atomic layer deposition using NH_3 and N_2 plasmas," Young Bok Lee⁺, **Il-Kwon Oh⁺**, Edward Namkyu Cho, Pyung Moon, Hyungjun Kim, Ilgu Yun, **Applied Surface Science** 349, 757–762 (2015 May) http://dx.doi.org/10.1016/j.apsusc.2015.05.066 [First author]
49. "*In situ* surface cleaning on a Ge substrate using TMA and $MgCp_2$ for HfO_2-based gate oxides", **Il-Kwon Oh**, Kangsik Kim, Zonghoon Lee, Jeong-Gyu Song, Chang Wan Lee, David Thompson, Han-Bo-Ram Lee, Woo-Hee Kim, Wan Joo Maeng, Hyungjun Kim, **Journal of Materials Chemistry C** 3, 4852-4858 (2015 Apr) http://dx.doi.org/10.1039/c4tc02686a [First author]
50. "Lowering contact resistance by SWCNT–Al bilayer electrodes in solution processable metal-oxide thin film transistor", Su Jeong Lee, Tae Il Lee, Jee Ho Park, **Il-Kwon Oh**, Hyungjun Kim, Jung Han Kim, Chul-Hong Kim, Gee Sung Chae, Hong Koo Baik, Jae-Min Myoung **Journal of Materials Chemistry C** 3, 1403-1407 (2014 Dec) http://dx.doi.org/10.1039/c4tc02431a [Co-author]
51. "Atomic layer deposition of CeO_2/HfO_2 gate dielectrics on Ge substrate", Wan Joo Maeng, **Il-Kwon Oh**, Woo-Hee Kim, Min-Kyu Kim, Chang-Wan Lee, Clement Lansalot-Matras, David Thompson, Schubert Chu, Hyungjun Kim, **Applied Surface Science** 321, 214–218 (2014 Oct) http://dx.doi.org/10.1016/j.apsusc.2014.10.025 [Co-author]
52. "Atomic layer deposition of B_2O_3/SiO_2 thin films and their application in an efficient diffusion doping process", Woo-Hee Kim, **Il-Kwon Oh**, Min-Kyu Kim, Wan Joo Maeng, Chang-Wan Lee, Gyeongho Lee, Clement Lansalot-Matras, Wontae Noh, David Thompson, David Chu, Hyungjun Kim, **Journal of Materials Chemistry C** 2, 5805-5811 (2014 May) http://dx.doi.org/10.1039/c4tc00648h [Co-author]

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54. “Fabrication of transferable Al_2O_3 nanosheet by atomic layer deposition for graphene FET”, Hanearl Jung, Jusang Park, **Il-Kwon Oh**, Taejin Choi, Sanggeun Lee, Juree Hong, Taeyoon Lee, Soo-Hyun Kim, Hyungjun Kim, **ACS Applied Materials and Interfaces** 6, 2764–2769 (2014 Feb) http://dx.doi.org/10.1021/am4052987 [Co-author]
55. “Atomic layer deposition of Y_2O_3 and yttrium-doped HfO_2 using a newly synthesized $Y(iPrCp)_2$(N-iPr-amd) precursor for a high permittivity gate dielectric”, Jae-Seung Lee, Woo-Hee Kim, **Il-Kwon Oh**, Min-Kyu Kim, Gyeongho Lee, Chang-Wan Lee, Jusang Park, Clement Lansalot-Matras, Wontae Noh, Hyungjun Kim, **Applied Surface Science** 297, 16–21, (2014 Jan) http://dx.doi.org/10.1016/j.apsusc.2014.01.032 [Co-author]
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57. “Synthesis of wafer-scale uniform molybdenum disulfide films with control over the layer number using a gas phase sulfur precursor”,Youngbin Lee, Jinhwan Lee, Hunyoung Bark, **Il-Kwon Oh**, Gyeong Hee Ryu, Zonghoon Lee, Hyungjun Kim, Jeong Ho Cho, Jong-Hyun Ah, Changgu Lee, **Nanoscale** 6, 2821-2826 (2013 Dec) http://dx.doi.org/10.1039/c3nr05993f [Co-author]
58. “The effect of La_2O_3-incorporation in HfO_2 dielectrics on Ge substrate by atomic layer deposition”, **Il-Kwon Oh**, Min-Kyu Kim, Jae-seung Lee, Chang-Wan Lee, Clement Lansalot-Matras, Wontae Noh, Jusang Park, Atif Noori, David Thompson, Schubert Chu, W.J. Maeng, Hyungjun Kim, **Applied Surface Science** 287, 349– 354 (2013 Oct) http://dx.doi.org/10.1016/j.apsusc.2013.09.153 [First author]

- Will be submitted soon –

1. “Increased grain size of HfO_2 driven by dysprosium doping for high-k dielectrics", **Il-Kwon Oh**,* Kangsik Kim,* Zonghoon Lee, Wan Joo Maeng, Woo-Hee Kim, Hyungjun Kim will be submitted soon [First author]
2. “Study on reaction mechanism of atomic layer deposition with a series of precursors ", **Il-Kwon Oh**, Tania Sandoval, Il-Kwon Oh, Tania Sandoval, Tzu-Ling Liu, Nathan Richey, Nguyen Chi Thang, Han-Bo-Ram Lee, Stacey F. Bent will be submitted soon [First author]
3. “Hafnium oxynitride carbonate films deposition via molecular layer deposition”, Hayrensa Ablat, **Il-Kwon Oh**, Nathaniel E Richey, Solomon T Oyakhire, Yufei Yang, William Huang, Yi Cui, Stacey F. Bent [Co-author]
4. “Annealing effect on Dy-doped HfO_2", **Il-Kwon Oh**, Kangsik Kim, Zonghoon Lee, Wan Joo Maeng, Woo-Hee Kim, Hyungjun Kim [First author]

- In preparation –

1. “Transformation of crystalline phase of monoclinic HfO_2 through Er doping by atomic layer deposition", Su-hwan Minh,* **Il-Kwon Oh**,* Bo-Eun Park , Woo-Hee Kim*, Hyungjun Kim* [Corresponding author]
2. “HfN surface treatment for the improvement of interface quality in Ge and TiN substrates", Jaehwan Lee, **Il-Kwon Oh***, Hyungjun Kim* [Corresponding author]
4. “Comparative Study on ALD Al_2O_3 using different oxidants", Hwang Je Woo, Seunggi Seo, **Il-Kwon Oh**, Bonggeun Shong, Hyungjun Kim, [Co-author]

5. “High quality W thin film deposition by atomic layer deposition using WCl_5 and WCl_6", Seunggi Seo, Youjin Lee, **Il-Kwon Oh**, Bonggeun Shong, Hyungjun Kim, [Co-author]
6. “Process-pressure-induced Tuning of SiO_2 Density by Atomic Layer Deposition", Seunggi Seo, Youjin Lee, **Il-Kwon Oh**, Hyungjun Kim, [Co-author]
7. “Temperature dependent growth characteristics and film properties of atomic layer deposition of titanium silicate for spacer patterning” Sanghun Lee, Hanearl Jung, Seunggi Seo, Woo-Jae Lee, Wontae Noh, Se-Hun Kwon, **Il-Kwon Oh**, and Hyungjun Kim, [Co-author]

Journal Review Experience

- Chemistry of Materials
- ACS Applied Materials and Interfaces
- ACS Applied Electronic Materials
- Thin Solid Films
- Journal of Vacuum Science and Technology A
- Applied Physics Letters
- Applied Surface Science
- Micromachines
- Critical Reviews in Solid State and Materials Sciences
- Scientific Reports
- Applied Science
- Environmental Science & Technology

Patents

Granted (International)

1. “Display Device and Fabricating Method Thereof”, Il-Kwon Oh, Seunggi Seo, Ho-Jin Kim, ChoongKeun Yoo, YongBaek Lee, Hyungjun Kim,
   US 10,396,309 B2, 2019/08/27
2. “Superhydrophobic Coating Materials and Method for Manufacturing the Same”, Il-Kwon Oh, Han-Bo-Ram Lee, Hyungjun Kim,
   US 10,392,701 B2, 2019/08/27
3. “Method of Removing Oxide from Substrate and Method of Manufacturing Semiconductor Device Using the Same”, Il-Kwon Oh, Hyungjun Kim,
   US 9,780,172 B2, 2017/10/03
4. “Display Device and Fabricating Method Thereof”, Il-Kwon Oh, Seunggi Seo, Ho-Jin Kim, ChoongKeun Yoo, YongBaek Lee, Hyungjun Kim,
   EP 3,179,530 B1 (application number: 16201360.1), 2017/06/14

Granted (Domestic)

5. “Method for Fabricating Semiconductor”, Il-Kwon Oh, Taejin Choi, Hyungjun Kim,
   KR 10-2147149, 2020/07/27
6. “Method for antimicrobial coating of wood”, Il-Kwon Oh, Woo-Hee Kim,
   KR 10-2097549, 2020/03/10

7. “Method for Fabricating Thin Films”, Il-Kwon Oh, Chang-Mo Yoon, Hyungjun Kim, Han-Bo-Ram Lee, KR-10-194819, 2019/01/22
8. “Method for Depositing Metal Oxide Films Including In Buffer Layers”, Il-Kwon Oh, Seoungi Seo, Yujin Lee, Hyungjun Kim,
   KR-10-1898161, 2018/09/06
9. “Method for Depositing Metal Oxide Films By Plasma-Enhanced Atomic Layer Deposition”, Il-Kwon Oh, Seoungi Seo, Yujin Lee, Hyungjun Kim,
   KR 10-1884555, 2018/07/26
10. “Electric Device for MIM Capacitor Having Enhanced Electrical Characteristics and Manufacturing Method Thereof”, Il-Kwon Oh, Bo-Eun Park, Han-Bo-Ram Lee, Hyungjun Kim,
    KR 10-1752060, 2017/06/22
11. “Method for Modifying Surface of Substrate Using Rare Earth Oxide Thin Film”, Il-Kwon Oh, Han-Bo-Ram Lee, Jun-Ho Choi, Hyugnjun Kim,
    KR 10-1751619, 2017/06/21
12. “Filter for Removing Moisture and Method for Manufacturing the Same”, Il-Kwon Oh, Chang-Mo Yoon, Han-Bo-Ram Lee, Hyungjun Kim,
    KR 10-1670337, 2016/10/24
13. “Apparatus for Plasma Enhanced Atomic Layer Deposition and Method for Forming Thin Film Oxides Using the Same”, Il-Kwon Oh, Han-Bo-Ram Lee, Hyungjun Kim,
    KR 10-1662194, 2016/09/27
14. “Apparatus and Method for Performing Plasma Enhanced Atomic Layer Deposition Employing Very High Frequency”, Il-Kwon Oh, Gil-sang Yoo, Han-Bo-Ram Lee, Hyungjun Kim,
    KR 10-1596329, 2016/02/16
15. “Superhydrophobic Coating Materials and Method for Manufacturing the Same”, Il-Kwon Oh, Han-Bo-Ram Lee, Hyungjun Kim,
    KR 10-1617396, 2016/04/26
16. “Method for Forming Coating Layer and Coating Material Having Waterproof Property”, Il-Kwon Oh, Han-Bo-Ram Lee, Hyungjun Kim,
    KR 10-1615897, 2016/04/21
17. “A Deposition Method of Hafnium-Nitride Using Hydrogen Plasma and Semiconductor Device Using the Same”, Il-Kwon Oh, Hyungjun Kim, Min-Kyu Kim,
    KR 10-1504548, 2015/03/16
18. “Epitaxial Growth of Dy-doped Hafnium Oxide”, Il-Kwon Oh, Jae-seung Lee, Hyungjun Kim,
    KR 10-1493424, 2015/02/09
19. “Method for Reducing Native Oxide on Substrate and Method for Manufacturing a Semiconductor Device Using the Same”, Il-Kwon Oh, Hyungjun Kim,
    KR 10-1455263, 2014/10/21

Pending (International)

1. “New precursor for selective atomic layer deposition of Al_2O_3 with small molecule inhibitor", Il-Kwon Oh, Josiah Yarbrough, Stacey F. Bent,
   (Stanford Docket S20-290)
2. “Advanced precursor for selective atomic layer deposition of Al_2O_3" Il-Kwon Oh, Stacey F. Bent,
   (Stanford Docket S20-277)

3. “Method for Forming Thin Film”, Il-Kwon Oh, Chang-Mo Yoon, Hyungjun Kim, PCT/KR2016/014333, 2016/12/07
4. “Filter for Removing Moisture and Method for Manufacturing the Same”, Il-Kwon Oh, Chang-Mo Yoon, Han-Bo-Ram Lee, Hyungjun Kim, PCT/KR2016/014106, 2016/12/02
5. “Display Device and Fabricating Method Thereof”, Il-Kwon Oh, Seunggi Seo, Ho-Jin Kim, ChoongKeun Yoo, YongBaek Lee, Hyungjun Kim, EU 16201360.1, 2016/11/30
6. “Display Device and Fabricating Method Thereof”, Il-Kwon Oh, Seunggi Seo, Ho-Jin Kim, ChoongKeun Yoo, YongBaek Lee, Hyungjun Kim, US 10396309, 2016/11/30
7. “Method for Forming Coating Layer and Coating Material Having Waterproof Property”, Il-Kwon Oh, Han-Bo-Ram Lee, Hyungjun Kim, US 14/814,888, 2015/07/31
8. “Superhydrophobic Coating Materials and Method for Manufacturing the Same”, Il-Kwon Oh, Han-Bo-Ram Lee, Hyungjun Kim, US 14/815,797, 2015/07/31
9. “Method for Reducing Native Oxide On Substrate and Method for Manufacturing a Semiconductor Device Using the Same”, Il-Kwon Oh, Hyungjun Kim, US 14/590,319, 2015/01/06

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10. “Method for antimicrobial coating of wood”, Il-Kwon Oh, Woo-Hee Kim, KR 10-2018-0103532, 2018/08/31
11. “Method for Fabricating Semiconductor”, Il-Kwon Oh, Taejin Choi, Hyungjun Kim, KR 10-2018-0066670, 2018/06/11
12. “Method for Depositing Metal Oxide Films Including In Buffer Layers”, Il-Kwon Oh, Seoungi Seo, Yujin Lee, Hyungjun Kim, KR 10-2017-0016877, 2017/02/07
13. “Method for Depositing Metal Oxide Films By Plasma-Enhanced Atomic Layer Deposition”, Il-Kwon Oh, Seoungi Seo, Yujin Lee, Hyungjun Kim, KR 10-2017-0016878, 2017/02/07
14. “Method of Manufacturing a High Dielectric Thin Flm using 2-Dimensional Material with Surface Functionalized”, Il-Kwon Oh, Jong-suh Park, Han-Bo-Ram Lee, Hyungjun Kim, KR 10-2016-0032963, 2016/02/19
15. “Method for Forming Thin Film”, Il-Kwon Oh, Chang-Mo Yoon, Hyungjun Kim, KR 10-2016-0014605, 2016/02/05
16. “Method for Modifying Surface of Substrate Using Rare Earth Oxide Thin Film”, Il-Kwon Oh, Han-Bo-Ram Lee, Jun-Ho Choi, Hyungjun Kim, KR 10-2015-0178476, 2015/12/14
17. “Plasma Enhanced Atomic Layer Deposition Method Using an Additional Gas Injection”, Il-Kwon Oh, Han Earl Jung, Hyungjun Kim, KR 10-2015-0173265, 2015/12/07
18. “Display Device and Fabricating Method Thereof”, Il-Kwon Oh, Seunggi Seo, Ho-Jin Kim, ChoongKeun Yoo, YongBaek Lee, Hyungjun Kim, KR 10-2015-0168701, 2015/11/30

19. “A Functional Filter and Manufacturing Method of the Same”, Il-Kwon Oh, Chang-Mo Yoon, Han-Bo-Ram Lee, Hyungjun Kim,
KR 10-2015-0171229, 2015/10/15
20. “Electric Device for MIM Capacitor Having Enhanced Electrical Characteristics and Manufacturing Method Thereof”, Il-Kwon Oh, Bo-Eun Park, Han-Bo-Ram Lee, Hyungjun Kim
KR 10-2015-0119039, 2015/08/24
21. “Electric Device for MIM Capacitor having Enhanced Electrical Characteristics and Manufacturing Method Thereof”, Il-Kwon Oh, Bo-Eun Park, Han-Bo-Ram Lee, Hyungjun Kim
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22. “Apparatus for Plasma Enhanced Atomic Layer Deposition and Method for Forming Thin Film Oxides Using the Same”, Il-Kwon Oh, Han-Bo-Ram Lee, Hyungjun Kim,
KR 10-2015-0042459, 2015/03/26
23. “Filter for Removing Moisture and Method for Manufacturing the Same”, Il-Kwon Oh, Chang-Mo Yoon, Han-Bo-Ram Lee, Hyungjun Kim,
KR 10-2014-0194740, 2014/12/31
24. “Apparatus and Method for Performing Plasma Enhanced Atomic Layer Deposition Employing Very High Frequency”, Il-Kwon Oh, Gil-sang Yoo, Han-Bo-Ram Lee, Hyungjun Kim, KR 10-2014-0107123, 2014/08/18
25. “Superhydrophobic Coating Materials and Method for Manufacturing the Same” Il-Kwon Oh, Han-Bo-Ram Lee, Hyungjun Kim,
KR 10-2014-0098866, 2014/08/01
26. “Method for Forming Coating Layer and Coating Material Having Waterproof Property”, Il-Kwon Oh, Han-Bo-Ram Lee, Hyungjun Kim,
KR 10-2014-0107123, 2014/08/01
27. “Epitaxial Growth of Dy-doped Hafnium Oxide”, Il-Kwon Oh, Jae-seung Lee, Hyungjun Kim,
KR 10-2014-0002911, 2014/01/09
28. “Method for Reducing Native Oxide on Substrate and Method for Manufacturing a Semiconductor Device Using the Same”, Il-Kwon Oh, Hyungjun Kim,
KR 10-2014-0001327, 2014/01/06
29. “A Deposition Method of Hafnium-Nitride Using Hydrogen Plasma and Semiconductor Device Using the Same”, Il-Kwon Oh, Min-Kyu Kim, Hyungjun Kim,
KR 10-2013-0048935, 2013/04/30

Conference Presentations

Invited talks

1. “ALD High-k Dielectrics for Ge- and Graphene-based Devices: Strategies for the Improvement of Electrical Properties” **Il-Kwon Oh**, International Conference on Electronic Materials and Nanotechnology for Green Environment, 2020,11, Virtual Conference, Jeju, Korea
2. “Recent Trend on the Investigation of Area-selective Atomic Layer Deposition and Its Applications”, **Il-Kwon Oh**, Hyungjun Kim, Materials Research Society of Korea, 2017.11, Geung-Ju, Korea
3. “Reaction Mechanism of Area-selective Atomic Layer Deposition for Al_2O_3 Films”, **Il-Kwon Oh**, Hyungjun Kim, The 4th international symposium on hybrid materials and processing (HYMAP), 2017.11, Bu-San, Korea
4. “High-k Dielectrics for Si- and Ge-based Devices Grown by Atomic Layer Deposition”, **Il-Kwon Oh**, Hyungjun Kim, NanoKorea, 2017.07, Il-San, Korea

5. "The Improvement of Interface Quality by Using ALD High-k Dielectrics for Ge-based devices", **Il-Kwon Oh**, Hyungjun Kim, China ALD, 2016.10, Shanghai, China

Contributed talks

1."Effect of Controlling Compositional Depth Profile in La_2O_3/HfO_2 Nanolaminate Dielectric Layer for MIM Capacitor" **Il-Kwon Oh**, Min-kyu Kim, Hyungjun Kim, China Semiconductor Technology International Conference (CSTIC) 2012, 2012/03/18 ~ 2012/03/19, Shanghai, China
2. "Enhancement of Dielectric Constant through the Doping of CeO_2 into HfO_2 by Atomic Layer Deposition," Min-Kyu Kim, Woo-Hee Kim, W. J. Maeng, **Il-Kwon Oh**, and Hyungjun Kim, Materials Research Society Spring Meeting and Exhibit, 2012/4/9~2012/4/13, San Francisco, USA
3. "Performance Enhancement of DRAM Capacitor by Using La_2O_3/HfO_2 Nanolaminate Structure," **Il-Kwon Oh**, Min-Kyu Kim, Jusang Park, Hyungjun Kim, Materials Research Society of Korea, 2012.05, Korea
4. "The Structural and Electrical Properties in CeO_2 Dielectric on Ge Substrate for MOS Capacitors by Atomic Layer Deposition with $Ce(iprCp)_3$," **Il-Kwon Oh**, Min-Kyu Kim, Ju-Sang Park, Julien Gatineau, Changhee Ko, and Hyungjun Kim, Pacific Rim Meeting and Solid-State science (PRIME 2012 ECS 222nd Meeting), 2012.10, Hawaii, USA
5. "The Effect on Structure Control of La_2O_3/HfO_2 Nanolaminate Dielectric Layers in MIM Capacitors", Min-Kyu Kim, **Il-Kwon Oh**, Hyungjun Kim, The Institute of Electronics and Information Engineers, 2012.11, Seoul, Korea
6. "Growth Characteristics and Electrical Properties of Y_2O_3 and Y-doped HfO_2 by Atomic Layer Deposition," Jae-Seung Lee, Min-Kyu Kim, **Il-Kwon Oh**, Hyungjun Kim, Materials Research Society of Korea, 2012.11, Korea
7. "The Chemical and Electrical Properties of ALD HfO_2 on Ge Substrate MOS Capacitor with TMA Self-cleaning Surface Treatment," Min-Kyu Kim, **Il-Kwon Oh**, Jae-seung Lee, Jusang Park, Hyungjun Kim, Materials Research Society Spring Meeting, 2013.04, Korea
8. "The Structural and Electrical Properties of HfO_2, La_2O_3, HfO_2/La_2O_3 and La-doped HfO_2 Dielectric Layers on Ge Substrate by Atomic Layer Deposition," **Il-Kwon Oh**, Min-Kyu Kim, Jae-seung Lee, Chang-Wan Lee, Jusang Park, Clement Lansalot-Matras, Wontae Noh, Hyungjun Kim, Materials Research Society Spring Meeting, 2013.04, Korea
9. "Fabrication of Transferrable Al_2O_3 Nanosheet using Atomic Layer Deposition," Han Earl Jung, **Il-Kwon Oh**, Tae-Wook Nam, Jae-Seung Lee, Hyungjun Kim, Materials Research Society of Korea, 2013.05, Korea
10. "The Electrical Properties of Ge MOS Capacitors with Passivation Layer of La_2O_3 on Ge Substrate by Atomic Layer Deposition," **Il-Kwon Oh**, Min-Kyu Kim, Jae-seung Lee, Chang-Wan Lee, Clement Lansalot-Matras, Wontae Noh, Hyungjun Kim, The 11th International Nanotech Symposium & Nano-Convergence Expo Nano Korea 2013.07, Korea
11. "The Growth Characteristics and Film Properties of Dy_2O_3 and Dy-Doped HfO_2 Dielectrics by Plasma-Enhanced Atomic Layer Deposition on Si Using Newly Synthesized Dy Precursor," Jae-Seung Lee, **Il-Kwon Oh**, Jusang Park, Kyung Ho Lee, Clement Lansalot-Matras, Wontae Noh, Henri Chevrel and Hyungjun Kim, 13th International Conference on Atomic Layer Deposition 2013, 2013.07, San Diego, USA

12. "Significant Reduction of Leakage Current for HfO_2-based MOS Capacitor through Doping Dy by Plasma-Enhanced Atomic Layer Deposition," Jae-Seung Lee, **Il-Kwon Oh**, Kyeong Ho Lee, Clement Lansalot-Matras, Wontae Noh, and Hyungjun Kim, International Conference on Surface Engineering, 2013.11, Busan, Korea
13. "In-situ Self-cleaning Process Using TMA or $Mg(Cp)_2$ for Ge Substrate," **Il-Kwon Oh** and Hyungjun Kim, International Conference on Surface Engineering, 2013.11, Busan, Korea
14. "Nucleation and Growth Mechanism of Atomic Layer Deposition HfO_2 on Graphene," **Il-Kwon Oh**, Kangsik Kim, Mi Jin Lee, Seungwoo Son, Zonghoon Lee, Clement Lansalot-Matras, Wontae Noh, Jukka Tanskanen, Han-Bo-Ram Lee, Hyungjun Kim, Materials Research Society Spring 2014.04, Korea
15. "Atomic Layer Deposition of HfO_2 Using Cyclopentadienyl Hafnium Chloride Precursors," Bo-Eun Park, **Il-Kwon Oh**, Venkateswara Pallem, Clement Lansalot-Matras, Hyungjun Kim, 14th International Conference on Atomic Layer Deposition, 2014.06, Kyoto, Japan
16. "Comparative Study on Nucleation and Growth of Atomic Layer Deposition HfO_2 on Graphene," **Il-Kwon Oh**, Kangsik Kim, Mi Jin Lee, Seungwoo Son, Zonghoon Lee, Clement Lansalot-Matras, Wontae Noh, Jukka Tanskanen, Han-Bo-Ram Lee, Hyungjun Kim, 14th International Conference on Atomic Layer Deposition, 2014.06, Kyoto, Japan
17. "The Effects of Precursor Ligands on Growth Characteristics and Dielectric Properties of Atomic Layer Deposition HfO_2," Bo-Eun Park, **Il-Kwon Oh**, Changwan Lee, Gyeongho Lee, Clement Lansalot-Matras, Wontae Noh, Hyungjun Kim, and Han-Bo-Ram Lee, International Conference on Microelectronics and Plasma Technology 2014, 07.
18. "Bias Temperature Stress Tests on Cu Gate TFT with Al_2O_3 and HfO_2 Gate Insulators and TaN Diffusion Barrier", Whang-Je Woo, Tae-Wook Nam, Han Earl Jung, **Il-Kwon Oh**, Hyugnjun Kim, International Meeting on Information Display 2014, 2014.08
19. "Nucleation and Growth of ALD HfO_2 on Graphene Surface", **Il-Kwon Oh**, Kang-sik Kim, Mi-Jin Lee, Zong-hun Lee, Clement Lansalot-Matras, Won-Tae Noh, Jukka Tanskanen, Hyungjun Kim, Han-Bo-Ram Lee, Materials Research Society of Korea, 2014.11, Korea
20. "The Effects of Plasma Erequency on High-k Film Properties in Plasma-enhanced Atomic Layer Deposition," **Il-Kwon Oh**, Chang-Mo Yoon, Gil-Sang Yoo, Chang Wan Lee, Tae-Hyung Lee, Geun-Young Yeom, Hyungjun Kim, Han-Bo-Ram Lee, The Korean Conference on Semiconductors, 2015. 02, Korea
21. "Nanoscale Hydrophobic Coating by Atomic Layer Deposition Rare Earth Oxides", **Il-Kwon Oh**, Kangsik Kim, Zonghoon Lee, Kyung Yong Ko, Su Jeong Lee, Jae-Min Myung, Clement Lansalot-Matras, Wontae Noh, Hyungjun Kim, Han-Bo-Ram Lee, Material Research Society, 2015.04, San Francisco, USA
22. "The Enhancement of Electrical Properties through Y doping into ZrO_2 and Control of Oxygen Vacancy", Bo-Eun Park, **Il-Kwon Oh**, David Thompson, Han-Bo-Ram Lee, Hyungjun Kim, Materials Research Society of Korea, 2015.05, Korea
23. "Er-doped HfO_2" **Il-Kwon Oh**, Hyungjun Kim, The Institute of Electronics and Information Engineers, 2015. 06, Korea
24. "Lowering Plasma Damage in PE-ALD by Using VHF Plasma Source", **Il-Kwon Oh**, Chang Mo Yoon, Tae Hyung Kim, Geun Young Yeom, Kangsik Kim, Zonghoon Lee, Hanearl Jung, Changwan Lee, Han-Bo-Ram Lee, Hyungjun Kim, Advanced Metallization Conference, 2015.07.

25. "Significant Enhancement of the Electrical Properties through the Control of Oxygen Vacancy by Doping of Y into ZrO_2", Bo-Eun Park, **Il-Kwon Oh**, Clement Lansalot-Matras, David Thompson, Han-Bo-Ram Lee, Hyungjun Kim, 15th International Conference on Atomic Layer Deposition, 2015.07, Portland, USA
26. "Wettability of ALD Rare Earth Oxides for Superhydrophobic Coating", Chang Mo Yoon, **Il-Kwon Oh**, Kangsik Kim, Zonghoon Lee, Clement Lansalot-Matras, Wontae Noh, Han-Bo-Ram Lee, Hyungjun Kim, 15th International Conference on Atomic Layer Deposition, 2015.07, Portland, USA
27. "Improved Electrical Properties in Cu gate TFT with Oxide Semiconductor by Using TaN Diffusion Barrier", Whang Je Woo, Taewook Nam, Hanearl Jung, **Il-Kwon Oh**, Hyungjun Kim, International Technical Conference on Circuits/Systems, Computers and Communications, 2015.07.
28. "High Quality GeO_2 by Atomic Layer Deposition", Chang Mo Yoon, **Il-Kwon Oh**, Clement Lansalot-Matras, Wontae Noh, Han-Bo-Ram Lee, Hyungjun Kim, International Russia Conference on Atomic Layer Deposition, 2015.09, Moscow, Russia
29. "Fundamental Study of Atomic Layer Deposited Rare Earth Oxides for Hydrophobic Coating", **Il-Kwon Oh**, Kangsik Kim, Zonghoon Lee, Kyung Yong Ko, Su Jeong Lee, Jae-Min Myung, Clement Lansalot-Matras, Wontae Noh, Hyungjun Kim, Han-Bo-Ram Lee, International Russia Conference on Atomic Layer Deposition, 2015.09, Moscow, Russia
30. "Influence of Cl Impurity Amounts in HfO_2 Films Grown by Atomic Layer Deposition" Bo-Eun Park, **Il-Kwon Oh**, Changwan Lee, Gyeongho Lee, Clement Lansalot-Matras, Wontae Noh, Han-Bo-Ram Lee, Hyungjun Kim, International Union of Materials Research Societies, 2015.10, Jeju, Korea
31. "Growth Characteristics and Electrical Properties of GeO_2 Grown by Atomic Layer Deposition" Chang Mo Yoon, **Il-Kwon Oh**, Han-Bo-Ram Lee, Hyungjun Kim, International Union of Materials Research Societies, 2015.10, Jeju, Korea
32. (Best Poster Award) "Analysis of Flm Properties of Sputter Al with Varying Process Parameters", **Il-Kwon Oh**, Chang-Mo Yoon, Jin-Wook Jang, Hyungjun Kim, The Korean Institute of Metals and Materials, 2015.10
33. "Area-selective Al_2O_3 Pattern Grown by Atomic Layer Deposition", Seunggi Seo, **Il-Kwon Oh**, Hanearl Jung, Jonggeun Yoon, Choongkeun Yoo, Ho-jin Kim, Yong-baek Lee, and Hyungjun Kim, American Vacuum Society 62nd , 2015.10, San Jose, USA
34. "The Analysis of Corrosion Properties Depending on the Properties of Sputtered Al" **Il-Kwon Oh**, Chang-Mo Yoon, Jin-Wook Jang, Hyungjun Kim, Materials Research Society of Korea, 2015.11.
35. (Best Poster Award) "Transformation of Crystalline Phase of HfO_2 by Er doping", **Il-Kwon Oh**, Hyungjun Kim, Korean Crystallographic Association, 2015.11, Korea
36. "ALD Rare Earth Oxides for Superhydrophobic Coating", **Il-Kwon Oh**, Kang-sik Kim, Mi-Jin Lee, Zong-hun Lee, Clement Lansalot-Matras, Wontae Noh, Jukka Tanskanen, Hyungjun Kim, Han-Bo-Ram Lee, Materials Research Society of Korea, 2015.11, Korea
37. "Purge-free Fast Atomic Layer Deposition Process for High-k Films", Hanearl Jung, **Il-Kwon Oh**, Soo-Hyun Kim, Hyungjun Kim,16th International Conference on Atomic Layer Deposition, 2016.07.
38. "Comparative Study of $HfCl_4$ and $Hf(EtCp)_2Cl_2$ for HfO_2 ALD", Bo-Eun Park, **Il-Kwon Oh**, Han-Bo-Ram Lee, Hyungjun Kim, 16th International Conference on Atomic Layer Deposition, 2016.07.
39. "Effect of Ge Doping on Dielectric Property of ZrO_2 grown by Atomic Layer Deposition", Yujin Lee, Bo-Eun Park, **Il-Kwon Oh**, Wontae Noh, Satoko Gatineau, Hyungjun Kim, 16th International Conference on Atomic Layer Deposition, 2016.07.

40. "Selective Growth of ALD Al_2O_3 for Nanoscale Patterning", Seunggi Seo, **Il-Kwon Oh**, Hanearl Jung, Jonggeun Yoon, Choongkeun Yoo, Ho-jin Kim, Yong-baek Lee, and Hyungjun Kim, 16th International Conference on Atomic Layer Deposition, 2016.07.
41. "The Improvement of Interface Quality by ALD High-k Dielectrics by ALD for Ge-based Devices", **Il-Kwon Oh**, Hyungjun Kim, International China Conference on Atomic Layer Deposition, 2016.10.
42. (Best Presentation Award) "The Improvement of Plasma Damage by using VHF Plasma Source in PE-ALD Process", **Il-Kwon Oh**, Tae-Hyung Kim, Geun-Young Yeom, Kang-sik Kim, Zong-hun Lee, Han-Bo-Ram Lee, Hyungjun Kim, Materials Research Society of Korea, 2016.11.
43. "The Growth Characteristics and Electrical Properties of Dy-doped HfO_2 Thin Film by Atomic Layer Deposition", **Il-Kwon Oh**, Hyungjun Kim, The Institute of Electronics and Information Engineers, 2017.02
44. "The Deposition of High-k Dielectric Thin Films by Using ALD for Ge- and Graphene-based Devices" **Il-Kwon Oh**, Hyungjun Kim, China Semiconductor Technology International Conference, 2017.03, Shanghai, China
45. (Best Presentation Award) "The Reaction Mechanism of AS-ALD Al_2O_3 nanopattern", **Il-Kwon Oh**, Hyungjun Kim, Materials Research Society of Korea, 2017.05, Korea
46. "Atomic Layer Deposited Ta-doped ZrO_2 for DRAM Capacitors", Bo-Eun Park, **Il-Kwon Oh**, Jong Seo Park, Seunggi Seo, Hyungjun Kim, 17th International Conference on Atomic Layer Deposition, 2017.07, Incheon, Korea
47. "Tungsten Thin Films Deposited by Plasma-enhanced atomic layer deposition with tungsten chloride precursor", Seunggi Seo, Yujin Lee, **Il-Kwon Oh**, Bonggeun Shong, Kyu-Hyun Yeom, Jungwun Hwang, Jang Hyeon Seok, Jung Woo Park, and Hyungjun Kim, 7th International Conference on Microelectronics and Plasma Technology, 2017.07, Jeju, Korea
48. "Plasma-enhanced Atomic Layer Deposition of Tungsten Films using Tungsten Chloride Precursor", Seunggi Seo, Yujin Lee, **Il-Kwon Oh**, Bonggeun Shong, Kyu-Hyun Yeom, Jungwun Hwang, Jang Hyeon Seok, Jung Woo Park, and Hyungjun Kim, 18th International Conference on Atomic Layer Deposition, 2017.08, Incheon, Korea
49. "Tungsten Thin Films Deposited by Plasma-enhanced atomic layer deposition with tungsten chloride precursor", Seunggi Seo, Yujin Lee, **Il-Kwon Oh**, Bonggeun Shong, Hyungjun Kim, The 8th International Conference on Microelectronics and Plasma Technology (ICMAP), 2018.07, Korea
50. "Plasma-enhanced Atomic Layer Deposition of Tungsten Films using Tungsten Chloride Precursor" Seunggi Seo, Yujin Lee, **Il-Kwon Oh**, Bonggeun Shong, Kyu-Hyun Yeom, Jungwun Hwang, Jang Hyeon Seok, Jung Woo Park, Hyungjun Kim,18th international conference on atomic layer deposition, 2018,07, Incheon, Korea
51. "Improvement of Electrical Properties of ZrO_2 by Ta Incorporation for Emerging Higher-k Material" Bo-Eun Park, **Il-Kwon Oh**, Jong Seo Park, Seunggi Seo, and Hyungjun Kim, International Union of Materials Research Societies, 2018.08
52. "Bi-layer High-k Dielectrics of Al_2O_3/ZrO_2 for Reduced Damages on MoS_2 Channel Layers during Atomic Layer Deposition" Whang Je Woo, Jeong-Gyu Song, Hanearl Jung, Bo-Eun Park, Jongseo Park, Kyunam Park, **Il-Kwon Oh**, and Hyungjun Kim, International Union of Materials Research Societies, 2018.08, Korea
53. "Plasma-enhanced atomic layer deposited Tungsten films by using Tungsten chloride precursor" Seunggi Seo, Yujin Lee, Hwi Yoon, **Il-Kwon Oh**, Bonggeun Shong, Kyu-Hyun Yeom, Jungwun

Hwang, Jang Hyeon Seok, Jung Woo Park, Hyungjun Kim, China Semiconductor Technology International Conference (CSTIC), 2019,03, Shanghai, Chian

54. "Elucidating Mechanisms of Selective ALD of Al_2O_3 by a Comparative Study of Precursors". **Il-Kwon Oh**, Tzu-Ling Liu, Tania Sandoval, Ralf Tonner, Stacey F. Bent, 19th international conference on atomic layer deposition, 2019,07, Seattle, USA
55. "Effects of Er Doping on Structural and Electrical Properties of HfO_2 Grown by Atomic Layer Deposition." Soo Hwan Min, Bo-Eun Park, Chang Wan Lee, Wontae Noh, **Il-Kwon Oh**, Woo-Hee Kim, Hyungjun Kim, 19th international conference on atomic layer deposition, 2019,07, Seattle, USA
56. "Improvement of Electrical Performances of Atomic Layer Deposited ZrO_2 MIM Capacitors with Ru Bottom Electrode". Jaehwan Lee, Bo-Eun Park, Wontae Noh, **Il-Kwon Oh**, Woo-Hee Kim, Hyungjun Kim, 19th international conference on atomic layer deposition, 2019,07, Seattle, USA
57. "Comparative Study on Selective ALD by Precursor Series" **Il-Kwon Oh**, Tzu-Ling Liu, Tania Sandoval, Ralf Tonner, Stacey F. Bent, 3rd NEW LIMITS Annual Review, 2020,07, Virtual Conference, USA

Invited Lectures

1. "Atomic Layer Deposition of Metal Oxides in CMOS-devices for Gas Sensor Applications", Department of Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands, November, 1, 2016, Host: Prof. Erwin Kessels
2. "Atomic Layer Deposition of High-k Dielectrics for Si, Ge, and Graphene-based Devices", School of Materials Science and Engineering, Yeungnam University, Korea, November, 23, 2016, Host: Prof. Soo-Hyun Kim
3. "The Investigation of Atomic-layer-deposited Rare-earth Oxides Films and Precursors for Catalyst and Semiconductor Technology", Tanaka Company, Tsukuba, Japan, December, 15, 2016, Host: Kyu Ho Seo
4. "The Introduction of Engineering Graduate School and Nanodevice Laboratory", Special Lecture at Junior Seminar Class, Yonsei University, Korea, 5, April, 2017, Host: Prof. Hyungjun Kim
5. "Basics of Vacuum Technology and Physical Vapor Deposition", Corning, Korea, 10, April, 2017 (4 hours), Host: Soo-ho Park
6. "In-situ Analysis for the Investigation of Reaction Mechanism of Atomic Layer Deposition", Corning, Korea, 11, April, 2017 (4 hours), Host: Soo-ho Park
7. "Practical Issues and Solutions of Atomic Layer Deposition Process", Corning, Korea, 14, April, 2017 (4 hours), Host: Soo-ho Park
8. "The Introduction of Issues and Solutions Using High-k Dielectrics Grown by ALD for Practical Semiconductor Applications", Samsung Advanced Institute of Technology, Korea, 19, April, 2017, Host: Jung Gyu Song
9. "The Introduction of High-k Dielectrics for Future Semiconductor's Scaling Down", Special Lecture at Semiconductor Physics , Yonsei University, Korea, 10, October, 2017, Host: Prof. Hyungjun Kim
10. "Basics of Thin Film Physics and Atomic Layer Deposition", Division of Advanced Materials Engineering, Chonbuk National University, Korea, 14, November, 2017, Host: Prof. Woo-Hee Kim

11. “ALD Basics; Basics of ALD, PE-ALD, ALD Tools, and DFT Calculation and Simulation for ALD”, Samsung SDI, Korea, 1, December, 2017 (5 hours) Host: Yong Tae Kim

12. “ALD Process; Vacuum, Setting of Tools, ALD Precursors, Issues during ALD, GPC Improvement, and Uniformity Improvement”, Samsung SDI, Korea, 8, December, 2017 (5 hours) Host: Yong Tae Kim

13. “Advanced ALD Process; Area-selective ALD, Doping and Alloying, ALD by Physisorption, MLD, and Basics of MOS Capacitors”, Samsung SDI, Korea, 15, December, 2017 (5 hours) Host: Yong Tae Kim

14. “ALD Oxides for Semiconductor Applications 1; Choice of Precursors (Hf, Zr..), High-k Materials on Si and Ge, and High-k materials on Metals”, Samsung SDI, Korea, 22, December, 2017 (5 hours) Host: Yong Tae Kim

15. “ALD Oxides for Applications 2; High-k Materials on 2D Materials, Doping for Fin-FET Devices, Spacer ALD for Multi-patterning Process, New Applications of ALD and Review of Recent Trend of Oxides ALD in Semiconductor Applications”, Samsung SDI, Korea, 22, December, 2017 (5 hours) Host: Yong Tae Kim

16. “Basics of Selective Deposition by Atomic Layer Deposition Especially for Al_2O_3 Nanopatterns”, School of Materials Science and Engineering, Incheon National University, Korea, February, 12, 2018, Host: Han-Bo-Ram Lee

17. “The Introduction of Atomic Layer Deposition for 4^{th} Generation Industrial Revolution”, Special Lecture at Basic Modern Physics , Yonsei University, Korea, 12, June, 2018, Host: Hyungjun Kim

18. “Fine Tuning of Surface Energy by Atomic Layer Deposition of Rare Earth Oxides”, School of Materials Science and Engineering, Hanyang University, Korea, 20, July, 2018, Host: Jin-Seong Park

19. “Selective Liquid Tweezer of Atomic Layer Deposition Rare Earth Oxides”, Korea Institute of Science and Technology, Korea, 27, July, 2018, Host: Seung Ki Lee

20. “Hydrophobicity by REO ALD”, Consultation of education, School of Materials Science and Engineering, Incheon National University, Korea, 26, December, 2018, Host: Han-Bo-Ram Lee

21. “Recent Trend of AS-ALD and AS-ALD for Al_2O_3 Nanopatterns”, School of Materials Science and Engineering, Yeungnam University, Korea, September, 12, 2018, Host: Prof. Soo-Hyun Kim

22. “Selective Deposition of Atomic Layer Deposition for Semiconductor Manufacture”, Samsung Advanced Institute of Technology, Korea, 17, December, 2018, Host: Jung Gyu Song

23. “Ternary Metal Oxides Grown by Atomic Layer Deposition for Spacer and Multi-patterning Process”, Consultation of education, School of Materials Science and Engineering, Incheon National University, Korea, 26, December, 2018, Host: Han-Bo-Ram Lee

24. “Area Selective ALD for Semiconductor Manufacturing and Precursor Designing”, Samsung Advanced Institute of Technology, Korea, 12, August, 2019, Host: Vice President. Jae Kwang Shin

25. “Mechanistic Study on AS-ALD for Semiconductor Manufacture”, School of Electronic and Electrical Engineering, Yonsei University, Korea, 14, August, 2019, Host: Hyungjun Kim

26. “Selective Deposition for Manufacturing Semiconductor Devices”, Department of Materials Science and Chemical Engineering, Hanyang University (ERICA), Korea, 16, August, 2019, Host: Woohee Kim

27. “Selective Deposition Toward Fabrication of Emerging Devices”, Consultation of education, School of Materials Science and Engineering, Incheon National University, Korea, 19, December, 2019, Host: Han-Bo-Ram Lee

28. “The role of precursor design on area-selective atomic layer deposition”, School of Electronic and Electrical Engineering, Yonsei University, Korea, 25, Febraury, Host: Hyungjun Kim

29. “The role of precursor design on area-selective atomic layer deposition”, Department of Materials Science and Chemical Engineering, Hanyang University (ERICA), Korea, 16, August, 2019, Host: Woohee Kim

Teaching Activities

1. Nanoscale Silicon Devices in Yonsei University
- Period: 3/2012 - 6/2012
- Teaching Assistant: Il-Kwon Oh
- Lecturer: Professor Hyungjun Kim

2. Basic Modern Physics in Yonsei University
- Period: 3/2013 - 6/2013
- Teaching Assistant: Il-Kwon Oh
- Lecturer: Professor Hyungjun Kim

3. Electrical and Electronic Engineering Experiments: Fundamentals in Yonsei University
- Period: 9/2014 - 12/2014
- Teaching Assistant: Il-Kwon Oh
- Lecturer: Professor Youngcheol Chae

4. Electrical and Electronic Engineering Experiments: Fundamentals in Yonsei University
- Period: 3/2017 - 8/2017
- General Manager of Experiments: Il-Kwon Oh
- Lecturer: Professor Hyungjun Kim

5. Basics of Thin Film Physics and Atomic Layer Deposition to Corning
- Period: 4/2017 (12 hours)
- Lecturer: Il-Kwon Oh

6. Atomic Layer Deposition from Basics to Practical Applications to Samsung SDI
- Period: 11/2017 - 12/2017 (25 hours)
- Lecturer: Il-Kwon Oh

Consulting Activities

1. Equipment and process set-up for plasma-enhanced atomic layer deposition of HfO_2
   - Requestor: Prof. Geun Young Yeom, Plasma & Nanomaterials Processing Laboratory, School of Advanced Materials Science and Engineering, Sungkyunkwan University
   - Period: 2013/05

2. Equipment and process set-up for atomic layer deposition system of Y_2O_3
   - Requestor: Prof. Han-Bo-Ram Lee, Materials Science & Engineering, Incheon National University
   - Period: 2014/07

3. Equipment and process set-up for atomic layer deposition system of BeO
   - Requestor: Prof. Jungwoo Oh, Electronic-Photonic Heterogeneous Integration Laboratory, School

of Integrated Technology (SIT), Yonsei University
- Period: 2018/01

4. Equipment for atomic layer deposition system of La_2O_3
   - Requestor: Prof. Geun Young Yeom, Plasma & Nanomaterials Processing Laboratory, School of Advanced Materials Science and Engineering, Sungkyunkwan University
   - Period: 2013/05

5. Equipment and process development for PE-ALD process for Improvement of WVTR
   - Requestor: Jung Hun Lee, LG Electronics
   - Period: 2016/05-12

6. Equipment and process set-up for atomic layer deposition system of Y_2O_3
   - Requestor: Prof. Tae-Woo Kim, Next Generation Semiconductor Device Laboratory, School of Electrical Engineering, University of Ulsan
   - Period: 2018/10

7. Analysis of interface quality in MOS capacitor; Terman and conductance methods
   - Requestor: Gwang Soo Huh, Applied Materials, Sunnyvale, CA
   - Period: 2020/02

Participating Research Projects

1. "The Study on Low Temperature ALD Process for Encapsulation Applications" funded by LG Display, (PI: Hyungjun Kim, 2013/09/01 ~ 2014/08/31)
2. "The Study on ALD-Based Graphene FET and Solid-State Device Applications" funded by Ministry of Education and Science Technology (PI: Hyungjun Kim, 2011/07/01 ~ 2014/06/30)
3. "The Development of High Density Plasma for Ultrafine Semiconductor and Flexible Display Process" funded by Ministry of Knowledge Economy (PI: Geun-Young Yeom, 2012/06/01 ~ 2016/05/31)
4. "The Study on the Atomic Layer Deposition for Next Generation Devices" funded by Applied Materials (PI: Hyungjun Kim, 2011/01/01 ~ 2015/12/31)
5. "The Precursor Evaluation and Process Development for Atomic Layer Deposition aiming at next generation semiconductor and display" funded by Air Liquide (PI: Hyungjun Kim, 2012/01/01 ~ present)
6. "The Development of Filter of Ultrafine Moisture Reduction for Industrial Oils Recycling" funded by small and medium business administration, (PI: Han-Bo-Ram Lee, 2014/12/01 ~ 2015/11/30)
7. "The Study on the Area-Selective ALD Process of Al_2O_3 by Using Stamping Method" funded by LG Display (PI: Hyungjun Kim, 2015/02/01 ~ 2016/01/31)
8. "The Study on Anti-Corrosive Behavior of Sputtered Al Thin Films" Funded by Packing Team, Samsung Electronics (PI: Hyungjun Kim, 2014/03/01 ~ 2015/02/28)
9. "The Study on ALD Process for Interfacial Layer in Future DRAM Capacitor" funded by DS Part Strategy Project, Samsung Electronics (PI: Hyungjun Kim, 2015/07/01 ~ 2016/08/31)
10. "The Evaluation of ALD Precursor Properties" funded by Wonik Materials (PI: Hyungjun Kim 2016/03/01~2016/08/31)
11. "The Study on PE-ALD Process for Improvement of WVTR" funded by LG Electronics (PI: Hyungjun Kim, 2016/05/01~2016/12/31)

12. “The Consultation of ALD Process” funded by Corning (PI: Hyungjun Kim, 2017/04/01 ~2017/04/30)
13. “The Consultation of ALD Tools and Process” funded by ITECHU (PI: Hyungjun Kim 2017/03/01~2018/02/28)
14. “Surface-Energy-Control-Based REO Membrane for Water Solution” funded by Research Affairs/University Industry Foundation, Yonsei University, (PI: Il-Kwon Oh, 2016/09/01~2017/08/31)
15. “Surface-Energy-Control-Based ALD REO Thin Films for Printed Electronics” funded by Research Affairs/University Industry Foundation, Yonsei University, (PI: Il-Kwon Oh, 2017/09/01~present)
16. “Development on Precursors for Carbon/Halogen-Free Thin Film and Their Delivery System for High-k/Metal Gate Application” funded by Ministry of Trade, Industry and Energy, (PI: Hyungjun Kim, 2017/09/01~2018/08/31)
17. “Development of Commercialization Technology of High Sensitive Gas Senor Based on Chalcogenide 2D Nano Material” funded by Ministry of Trade, Industry and Energy, (PI: Hyungjun Kim, 2017/09/01~2018/08/31)
18. “Area Selective Atomic Layer Deposition of Al_2O_3” funded by Merck, (PI: Stacey F. Bent, 2018/10/01~2021/02/05)
19. “New LIMTS Center” funded by Semiconductor Research Corporation, (PI: Stacey F. Bent, 2018/10/01~2021/02/05)
20. “Unlock Ideas Campaign” funded by Lam Research, (PI: Stacey F. Bent, 2018/10/01~2020/02/28)
21. “Surface Engineering for Selective Deposition” funded by Samsung R&D Center, Samsung Electronics, (PI: Stacey F. Bent, 2020/01/01~2021/02/05)
22. “Toward Next Generation Atomic Layer Processing” funded by Merck, (PI: Stacey F. Bent, 2020/01/01~2021/02/05t)