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Appointments

2012-present	**Professor**, Department of Energy Science, Sungkyunkwan University
2002-2012	**Professor**, School of Advanced Materials Engineering, Kookmin University
2007-2008	**Visiting Professor**, Department of Materials and Engineering, University of Texas, Dallas, Tx
2003-2003	**Visiting Scholar**, Max-Plank Institute fur Meallforschung, Stuttgart, Germany
1997-2002	**Member of Research Staff**, Samsung Advanced Institute of Technology, Suwon, Korea
1996-1997	**Alexander von Humboldt Research Fellow**, Max-Plank Institute fur Meallforschung, Stuttgart, Germany (Academic Advisors : Prof. Mafred Ruehle & Prof. Frit Aldinger)

Education

1994-1996	**Ph.D.** Materials Science and Engineering, Case Western Reserve University, Cleveland, OH USA (Thesis Advisors: Profs. Mark R. De Guire, and Arthur H. Heuer)
1991-1994	**M.S.** Materials Science and Engineering, Case Western Reserve University, Cleveland, OH USA (Thesis Advisors: Profs. Mark R. De Guire, Chaim Sukenik, and Arthur H. Heuer)
1986-1991	**B.S.** Ceramic Engineering, YonSei University, Seoul, Korea

Research Interests

Nanomaterials Processing and Characterization for Energy Applications (Next-generation photovoltaics and perovskite solar cells, Li-ion secondary battery, Photoelectrodes for water splitting), 1D Functional Metal Oxide Nanostructured Materials, Atomic Layer Deposition and 2D Transition metal chalcogenide, Atomic Force Microscopy and related Techniques.

Honors and Awards

Human Tech Paper Award – Gold & Bronze Prize (**2007**, Samsung Electronics, Korea)

Selected Research Grants

2018-2022	Korean National Research Foundation, Nature Inspired Innovative Technology Development
2018-2021	Korean National Research Foundation, US AFOSR
2019-2023	Korean National Research Foundation, 중견연구자 사업

Selected Recent Publications

Peer Reviewed Journal Publications (Selected)

(1) Seo, S., Jeong, S., Park, H., **Shin, H.** and Park, N.-G., "Atomic Layer Deposition for Efficient and Stable Perovskite Solar Cells" *ChemComm* **55**, 2403 – 2416 (2019)

(2) Lee, S., Bae, C., Lee, J., Lee, S., Oh, S.H., Kim, J., Park, G.S., Jung, H.S., and **Shin, H.**, "Fabrication of a Stable New Polymorph Gold Nanowire with 6-Fold Rotational Symmetry", *Adv. Mater.* **30**, 1706261 (2018) (Cover Illustration)

(3) Seo, S., Jeong, S., Bae, C., Park, N.-G., and **Shin, H.,** "Long – Term (~ 500 hrs) Stable Perovskite Solar Cells with Inorganic Electron and Hole Transporting Layers at 85 C under continuous 1-Sun Illumination in Ambient Air", *Adv. Mater.* 1801010 (2018) (Inside Cover Illustration)

(4) Bae, C., Kim, H., Kim, E., Park, H.G., and **Shin, H.**, "On the Atomic Layer Deposition into 2- versus 3-Dimensionally Ordered Nanoporous Media: Pore Size or Connectivity?" accepted for the publication in *Chem. Mater*. (2018)

(5) Ho, T.A., Bae, C., Nam, H., Kim, E., Lee, S.Y., Park, J.H., and **Shin, H.**, "Metallic Ni_3S_2 Film Grown by Atomic Layer Deposition as an Efficient and Stable Electrocatalyst for Overall Water Splitting", *ACS Appl. Mater. Interfaces,* **10**, 12807 – 12815 (2018)

(6) Son, D.-Y., Kim, S.-G., Seo, J.-Y., Cho, A.-N., Lee, S., **Shin, H.,** Lee, D., and Park, N.-G., "Universal Approach toward Hysteresis-Free Perovskite Solar Cell via Defect Engineering" *J. Am. Chem. Soc.* **140**, 1358 – 1364 (2018)

(7) Kim, W., Yung, M.S., Choi, J., Lee, S., Kim, J.K., Choi, S.U., Kim, Wook, Choi, D.-G., Ahn, H., Choi, D., **Shin, H.,** Kim, D., and Park, J.H., "Oriented Grains with Preferred Low-Angle Grain Boundaries in Halide Perovskite Films by Pressure-Induced Crystallization", *Adv. Energy Mater.* **8**, 1702369 (2018)

(8) Bae, C., Ho, T.A., Kim, H., Lee, S., Lim, S., Kim, M., Yoo, H., Montero Moreno, J. M. Park, J.H., and **Shin, H.,** "Bulk Layered Heterojunction as an Efficient Electrocatalyst for Hydrogen Evolution", *Science Advances,* **3**, E1602215 (2017)

(9) Kim, W., Yung, M.S., Choi, J., Lee, S., Kim, J.K., Choi, S.U., Kim, Wook, Choi, D.-G., Ahn, H., Choi, D., **Shin, H.,** Kim, D., and Park, J.H., "Preferred-oriented Grains with Low-angle Grain Boundaries in Halides Perovskite Films by Pressure-induced Re-crystallization", *Adv. Energy Mater.* 1702369 (2017)

(10) Jeong, A., Seol, D., Han, M.H., Seo, S., Yoo, T.S., Choi, W.S., Jung, H.S., **Shin, H.**, and Kim, Y., "Origin of Hysteresis in $CH_3NH_3PbI_3$ Perovskite Thin Films", *Adv. Func. Mater.* 1701924 (2017)

(11) Ho, T.A., Bae, C., Lee, S., Kim, M., Montero Moreno, J. M. Park, J.H., and **Shin, H.,** "Edge-On MoS_2 Thin Films by Atomic Layer Deposition for Understanding the Interplay between the Active Area and Hydrogen Evolution Reaction", *Chem. Mater.* **29**, 7604 – 7614 (2017)

(12) Son, D.-Y., Lee, J.-W., Choi, Y.J., Jang, I.-H., Lee, S., Yoo, P.J., **Shin, H.,** Ahn, N., Choi, M., Kim, D., and Park, N.-G., "Self-formed Grain Boundary Healing Layer for Highly Efficient Perovskite Solar Cells", **1**, 16081, *Nature Energy* (2016)

(13) Zhang, K., Kim, J.K., Ma, M., Yim, S.Y., Lee, C.-L., **Shin, H.,** and Park, J.H., "Delocalized Electron Accumulation at Nanorod Tips: Origin of Efficient H_2 Generation", ASAP, *Adv. Funct. Mater.* (2016)

(14) Seo, S., Park, I.J., Kim, M., Lee, S., Bae, C., Jung, H.S., Park, N.-G., Kim, J.Y., and **Shin, H.,** "An Ultra-thin, Un-doped NiO Hole Transporting Layer of Highly Efficient (16.4 %) Organic – Inorganic Hybrid Perovskite Solar Cells", **8**, 11403 - 11412, *Nanoscale* (2016)

(15) Kim, M., Lee, J., Lee, S., Seo, S., Bae, C., and **Shin, H.,** "Nanotubular Heterostructure of SnO_2/TiO_2 as Binder – free Anode in Li – ion Battery", *ChemSusChem*, **8**, 2363 – 2371 (2015)

(16) Yoo, H., Bae, C., Yang, Y., Kim, H., Kim, M., Lee, S., Kim, Y., and **Shin, H.,** "Spatial Charge Separation in Asymmetric Nanostructure of Au/TiO_2 by Light Induced Surface Potential Imaging", *Nano Lett.*, **14**, 4413 – 4417 (2014)

(17) Yoo, H., Kim, M., Bae, C., Lee, S., Kim, H., Ahn, T.K., and **Shin, H.,** "Understanding Photoluminescence of Monodispersed Crystalline Anatase TiO_2 Nanotube Arrays", *J. Phys. Chem. C.*, 118, 9726 – 9732 (2014)

(18) Kim, M., Bae, C., Kim, H., Yoo, H., Montero, J.M., Jung, H.S., Bachmann, J., Nielsch, K., and **Shin, H.,** "Confined Crystallization of Anatase TiO_2 Nanotubes and Its Implication on the Transport Properties", *J. Mater. Chem. A*,1 (2013)

(19) Yoo, H., Bae, C., Kim, M., Hong, S., No, K., Kim, Y., and **Shin, H.**, "Visualization of Three Dimensional Domain Structures in Ferroelectric $PbTiO_3$ Nanotubes", *Appl. Phys. Lett.*, 103 (2013)

(20) Bae, C., Kim, H., Yang, Y., Yoo, H., Montero, J.M., Bachmann, J., Nielsch, K., and **Shin, H.,** "Rapid, Conformal Gas-Phase Formation of Silica (SiO_2) Nanotubes form Water Condensates", *Nanoscale*, 5 (2013)

(21) Panda, K. S., Yoon, Y., Jung, H.S., Yoon, W.-S., and **Shin, H.,** "Nanoscale Size Effect of TiO_2 (anatase) Nanotubes with Uniform Wall Thickness as High Performance Anode for Li-ion Secondary Battery", *J. of Power Source,* 204 (2012)

(22) Changdeuck Bae, **Hyunjung Shin**, and Kornelius Nielsch, "Surface Modifications and Fabrication of 3D Nanostructures by Atomic Layer Deposition", *MRS Bulletin*, 36 (2011)

(23) Hyoungsoo Ko, Kyunghee Ryu, Hongsik Park, Chulmin Park, Daeyoung Jeon, Yong Kwan Kim, Juhwan Jung, Dong-Ki Min, Yunseok Kim, Ho Nyung Lee, Yoondong Park, **Hyunjung Shin**, and Seungbum Hong, "High-Resolution Field Effect Sensing of Ferroelectric Charges", *Nano Letters*, 11 (2011)

(24) Changdeuck Bae, Hyunjun Yoo, Sihyeong Kim, Kyungeun Lee, Jiyoung Kim, Myung M. Sung and **Hyunjung Shin**, "Template-Directed Synthesis of Oxide Nanotubes: Fabrication, Characterization, and Applications", *Chemistry of Materials*, 20 (2011)

(25) Noh, J.H., Han, H.S., Lee, S., Kim, J.Y., Hong, K.S., Han, G.-S., **Shin, H.,** and Jung, H.S., "Nanowire-Based Three-Dimensional Transparent Conducting Oxide Electrodes for Extremely Fast Charge Collection", *Adv. Ener. Mater.*,**1** (2011)

(26) Bae, C., Kim, H., Han, D., Yoo, H., Kim, J., and **Shin, H.,** "Nanoscale Ampoule Fabrication by Capillary Autoclosing", *Small* **5**, (2009)

(27) Bae, C., Moon, J., **Shin, H.,** Kim, J., and Sung, M.M., "Fabrication of Monodisperse Asymmetric Colloidal Clusters by Using Contact Area Lithography (CAL)" *J. Am. Chem. Soc.*129, (2007)

(28) Jang-sik Lee, Jinhan Cho, Chiyoung Lee, Inpyo Kim, Jeonggju, Park, Yong-Mu Kim, **Hyunjung Shin**, Jaegab Lee, and Frank Caruso, "Layer-by-Layer Assembled Charge-Trap Memory Devices with adjustable Electronic Properties", *Nature Nanotechnology*, 2 (2007)

(29) **Hyunjung Shin**, Dae-Kyun Jung, Jaegab Lee, Myung Mo Sung, and Jiyoung Kim, "Formation of TiO_2 and ZrO_2 Nanotubes using Atomic Layer Deposition with Ultra-precise Wall Thickness Control", *Advanced Materials*", 16 (2004)