

TAEGUN KIM

Ph. D. candidate



Solar Cell & Aerosol Science Laboratory

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RESEARCH INTERESTS

- **Thin film coating process:** Cold Gas Dynamic Spray (CGDS) & Aerosol Deposition (AD).
- **Thermal Hot spot:** Heat dissipation, Thermal Interface Material.
- **Photocatalysis applications:** Water purification, Self-cleaning, Water splitting.
- **Materials research:** Graphene (TCO, Heat sink), Lithium ion battery (Anode), Ceramic (TiO₂), Metal (Copper, Fe₂O₃), AgNW (Silver Nanowire, Transparent Conducting Film).

EDUCATION

- Ph. D. course in Mechanical Engineering (Mar. 2018~)
Korea University, Seoul, Korea
Advisor: Prof. Sam S. Yoon
- Master course in Mechanical Engineering, Feb. 2018,
Korea University, Seoul, Korea
Advisor: Prof. Sam S. Yoon
- Bachelor of Mechanical System Design Engineering, Feb. 2016,
Seoul National University of Science and Technology, Seoul, Korea
Advisor: Prof. Seong-Dong Kim

EMPLOYMENT

- 2016/Aug. to 2016/Dec.: Teaching Assistant, School of Mechanical Engineering, **Korea University**, Creativity in machine design: Capstone design.
- 2017/Mar. to 2017/June: Teaching Assistant, School of Mechanical Engineering, **Korea University**, Thermodynamics 1.
- 2017/Aug. to 2017/Dec.: Teaching Assistant, School of Mechanical Engineering, **Korea University**, Thermodynamics 2.
- 2018/Mar. to 2018/June.: Teaching Assistant, School of Mechanical Engineering, **Korea University**, Creativity in machine design: Capstone design.
- 2018/Aug. to 2018/Dec.: Teaching Assistant, School of Mechanical Engineering, **Korea University**, Thermodynamics 2
- 2019/Mar. to 2019/June: Teaching Assistant, School of Mechanical Engineering, **Korea University**, Thermodynamics 1

PUBLICATIONS

1. E. Samuel, TG Kim, CW Park, B. Joshi, Mark T. Swihart, SS. Yoon*, Supersonically sprayed Zn₂SnO₄/SnO₂/CNT nanocomposites for high-performance supercapacitor electrodes, , *ACS Sustainable Chemistry & Engineering* (IF=6.140), **submitted**.
2. **TG Kim**, CW Park, MW Kim, DY Yoo, J. Choi*, SS. Yoon*, Efficient heat spreader using supersonically sprayed graphene and silver nanowire, *Applied Thermal Engineering* (IF=3.771), **submitted**.
3. CS Ahn, CW Park, MW Kim, **TG Kim**, S. C. James, Y Yoon, A. L. Yarin, SS. Yoon*, Experimental and numerical investigation of smoke dynamics in vertical cylinders and open-air environment, *International Journal of Heat and Mass Transfer* (IF=3.458), **2019**.
4. HS Jo, E. Samuel, HJ Kwon, B. Joshi, MW Kim, **TG Kim**, Mark T. Swihart, SS. Yoon*, Highly flexible transparent substrate-free photoanodes using ZnO nanowires on nickel microfibers, *Chemical Engineering Journal* (IF=6.735), **2019**.
5. Bhavana Joshi, Edmund Samuel, Min-Woo Kim, Karam Kim, **TG Kim**, Mark T Swihart, Woo Young Yoon, Sam S Yoon, Electrospayed graphene films decorated with bimetallic (zinc-iron) oxide for lithium-ion battery anodes, *Journal of Alloys and Compounds* (IF=3.779), **2019**.
6. **TG Kim**, E. Samuel†, B. Joshi, CW Park, MW Kim, Mark T. Swihart, Sam S. Yoon*, Highly Efficient Water Splitting Photoanodes using Carbon Nanotube-decorated Supersonically Sprayed Zn₂SnO₄, *ACS Applied Materials & Interfaces* (IF=8.097), **submitted**.
7. **TG Kim**, E. Samuel†, B. Joshi, CW Park, MW Kim, WY Yoon*, Sam S. Yoon*, Supersonically Sprayed Iron Oxide Nanoparticles with Atomic Layer-deposited ZnO/TiO₂ Layers for Solar Water Splitting, *Journal of Alloys and Compounds* (IF=3.779), **2019**.
8. E Samuel, B Joshi, MW Kim, YI Kim, S Park, **TG Kim**, MT Swihart, Sam S. Yoon*, Zeolitic imidazolate framework-8 derived zinc oxide/carbon nanofiber as freestanding electrodes for lithium storage in lithium-ion batteries, *Journal of Power Sources* (IF = 6.945), **2018**
9. YI Kim†, E. Samuel†, B. Joshi, MW Kim, **TG Kim**, Mark T. Swihart, SS. Yoon, Highly efficient electrodes for supercapacitors using silver-plated carbon nanofibers with enhanced mechanical flexibility and long-term stability, *Chemical Engineering Journal* (IF=6.735), **2018**.
10. MW Kim†, B. Joshi†, E. Samuel, KR Kim, YI Kim, **TG Kim**, Mark T. Swihart, SS. Yoon*, Highly nanotextured b-Bi₂O₃ pillars by electrostatic spray deposition as photoanodes for solar water splitting, *Journal of Alloys and Compounds* (IF=3.133), **2018**.
11. **TG Kim**, E. Samuel†, B. Joshi, CW Park, MW Kim, WY Yoon*, Sam S. Yoon*, Supersonically Sprayed rGO-Zn₂SnO₄ Composites as Flexible, Binder-free, Scalable, and High-Capacity Lithium Ion Battery Anodes, *Journal of Alloys and Compounds* (IF=3.779), **2018**.
12. SD Kim†, JG Lee, **TG Kim**, K. Rana, JY Jeong, JH Park, SS Yoon, JH Ahn*, Additive-free electrode fabrication with reduced graphene oxide using supersonic kinetic spray for flexible lithium-ion batteries, *Carbon* (IF=7.082), **2018**.
13. MW Kim†, SP An†, KR Kim, **TG Kim**, HS Jo, DH Park, SS. Yoon, Packing of metalized polymer nanofibers for aneurysm embolization, *Nanoscale* (IF=7.367), **2018**.
14. MW Kim†, **TG Kim**, HS Jo, JG Lee, SC James, MS Choi, WY Kim, JS Yang, J Choi, SS. Yoon*, Nano-textured Surfaces using Hybrid Micro- and Nano-Materials for Efficient Water Cooling, *International Journal of Heat and Mass Transfer* (IF=3.458), **2018**.
15. HS Jot, **TG Kim**, JG Lee, HG Park, SC James, JH Choi, SS Yoon*, supersonically sprayed nanotextured surface with silver nanowires for enhanced pool boiling, *International Journal of Heat & Mass Transfer* (IF=3.458), **2018**.
16. YI Kim†, S An†, MW Kim, HS Jo, **TG Kim**, AL Yarin*, SS Yoon*, Spiky Cactus-Like Nickel-Silver Core-Shell Microfibers for Flexible Electronics, *Nanoscale* (IF=7.367), **2018**.
17. B. Joshi†, E. Samuel†, **TG Kim**, CW Park, YI Kim, Mark T. Swihart, WY Yoon*, SS Yoon*, Supersonically spray-coated zinc ferrite/graphitic-carbon nitride composite as a stable high-capacity anode material for lithium-ion batteries, *Journal of Alloys and Compounds* (IF=3.779), **2018**.
18. HS Jot, MW Kim†, **TG Kim**, S An, HG Park, JG Lee, SC James, JH Choi*, SS Yoon*, Supersonically spray-coated copper meshes as textured surface for pool boiling, *International Journal of Thermal Sciences* (IF=3.615), **2018**.
19. **TG Kim**†, JG Lee†, CW Park, HS Jo, MW Kim, DH Cho, YD Chung*, SS Yoon*, Effect of supersonic spraying impact velocity on opto-electric properties of transparent conducting flexible films consisting of silver nanowire, ITO, and polyimide multilayers, *Journal of Alloys and Compounds* (IF=3.779), **2017**.

20. **TG Kim**[†], JG Leet[†], CW Park, JH Choi, SC James, MS Choi, WY Kim, JS Yang, KH Kim, SS Yoon*, Supersonically sprayed clay, silica, and silica aerogel hybrid films as thermal and electrical barriers, *Ceramics International* (IF=2.986), 2018.
21. JG Leet[†], SP An[†], **TG Kim**, MW Kim, HS Jo, Mark T. Swihart, AL Yarin*, SS Yoon*, Self-Cleaning Anticondensing Glass via Supersonic Spraying of Silver Nanowires, Silica, and Polystyrene Nanoparticles, *ACS Applied Materials & Interfaces* (IF=7.145), 2017.
22. HS Jo[†], JG Leet[†], **TG Kim**, SP An, SC James, JH Choi, **SS Yoon***, Supersonically sprayed, triangular copper lines for pool boiling enhancement, *Int. J. Heat & Mass Transfer* (IF=3.458), 2017.
23. B Joshi[†], JG Leet[†], E Samuel, **TG Kim**, WY Yoon*, SS Yoon*, “Supersonically Blown reduced graphene oxide intertwined Fe-Fe₃C nanofibers for lithium ion battery anodes” *Journal of Alloys and Compounds* (IF=3.779), 2017.
24. E Samuel[†], JG Leet[†], B Joshi, **TG Kim**, MW Kim, IW Seong, WY Yoon*, SS Yoon*, “Supersonic Cold Spraying of Titania Nanoparticles on Reduced Graphene Oxide for Lithium Ion Battery Anodes”, *Journal of Alloys and Compounds* (IF=3.133), 2017.
25. JG Leet[†], DY Kim[†], **TG Kim**, JH Lee, SS. Al-Deyab, HW Lee, JS Kim, DH Yang, AL. Yarin*, SS Yoon*, “Supersonically Sprayed Copper-Nickel Microparticles as Flexible and Printable Thin-Film High-Temperature Heaters”, *Advanced Materials Interfaces* (IF=4.279), 2017.
26. JG Leet[†], JH Leet[†], S An, DY Kim, **TG Kim**, SS. Al-Deyab, A Yarin, SS Yoon*, “Highly Flexible, Stretchable, Wearable, Patternable, Transparent Heaters on Complex 3D Surface formed from Supersonically Sprayed Silver Nanowires”, *Journal of Materials Chemistry A* (IF=8.867), 2016.
27. JG Leet[†], B Joshi[†], JH Lee, **TG Kim**, DY Kim, SS. Al-Deyab, IW Seong, Mark T. Swihart, WY Yoon, SS Yoon*, “Stable High-Capacity Lithium Ion battery Anodes Produced by Supersonic Spray Deposition of Hematite Nanoparticles and Self-Healing Reduced Graphene Oxide”, *Electrochimica Acta* (IF=4.803) 2016.

PRESENTATIONS

1. **Tae-Gun Kim**, Sprayed for Water Splitting of Photoanodes using ball-milled Zn₂SnO₄ nanoparticles with CNTs, ICNSE, Fukuoka, Japan, Feb. 24-27, 2019.
2. **Tae-Gun Kim**, Supersonically Sprayed Nickel-Copper Microparticles as Flexible and Printable Thin-Film High-Temperature Heaters, International Conference on Liquid Atomization & Spray Systems (ICLASS), Chicago, USA, July. 22-26, 2018.
3. **Tae-Gun Kim**, Sam S. Yoon* Supersonically-Sprayed Aerogel and Clay particles as Thermal Barrier Films., Tokyo, Japan, Nov. 4-6th, 2017.
4. **Tae-Gun Kim**, Anti-condensing, Thermally-insulating, and Self-cleaning Glass by Supersonic Spraying of Silver Nanowires, Silica, and Polystyrene Nanoparticles, Pusan, Korea, Nov. 6-7th, 2017
5. **Tae-Gun Kim**, Jong-Gun Lee, The Electrical and Mechanical Properties of kinetic Sprayed Ni-Cu Electrodes, Gwang-Ju, Korea, Mar. 14-15th, 2017.
6. **Tae-Gun Kim**, Jong-Hyuk Lee, Jong-Gun Lee, Supersonic sprayed Fe-Fe₃C nanofibers entangled with reduced graphene oxide for lithium ion battery anodes, Hong Kong, China, Jan. 19-21th, 2017

SKILLS

- Technique: SEM (Scanning electron microscopy), EDX (Energy dispersive x-ray spectroscopy), AFM (Atomic force microscopy), XRD (X-ray diffraction), XPS (X-ray photoelectron spectroscopy), FTIR (Fourier transform infrared spectroscopy), Raman spectroscopy, UV-VIS spectrometer, TEM (Transmission electron microscopy).
 - Device fabrication: Aerosol deposition, Cold spray thin film deposition
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REFERENCE

- Sam S. Yoon
Professor
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