TAEGUN KIM

Doctor Course

Solar Cell & Aerosol Science Laboratory
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RESEARCH INTERESTS

- **Thin film coating process**: Cold Gas Dynamic Spray (CGDS) & Aerosol Deposition (AD), Electro-Spinning.
- **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 (Ni, CuO, Fe_2O_3, Al_2O_3), AgNW (Silver Nanowire, Transparent Conducting Film, Multi-Functional Sensor).

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,*** Thermodynamics1.
- 2017/Aug. to 2017/Dec.: Teaching Assistant, School of Mechanical Engineering, ***Korea University,*** Thermodynamics2.
- 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***, Thermodynamics2
- 2019/Mar. to 2019/June: Teaching Assistant, School of Mechanical Engineering, ***Korea University***, Thermodynamics1

PUBLICATIONS

1. **TG Kim†**, CW Park, SS Yoon*, Wearable fabric decorated with supersonically sprayed metal nanomaterials with superhydrophobicity, antibacterial, heating, and multi-sensor features, Advanced Functional Materials, **Under preparation.**
2. **TG Kim†**, CW Park, SS Yoon*, Supersonically sprayed carbon nanotubes and silver nanowires as efficient heat spreaders and cooling films, ***International Journal of Heat and Mass Transfer*. Under preparation.**
3. **TG Kim†**, CW Park, SS Yoon*, Highly nanotextured nickel-electroplated bismuth vanadate micropillars for hotspot removal via air and spray cooling, antibacterial, heating, and multi-sensor features, ***International Journal of Heat and Mass Transfer*. Submitted.**
4. CW Park, E Samuel, BN Joshi, **TG Kim**, A Aldalbahi, M El-Newehy, WY Yoon, SS Yoon*, Supersonically sprayed Fe_2O_3/C/CNT composites for highly stabilized Li-ion battery anodes, ***Chemical Engineering Journal*. Submitted.**
5. E Samuel, CW Park, **TG Kim**, BN Joshi, A Aldalbahi, H Alanzi, MT Swihart, WY Yoon, SS Yoon*, Dodecahedral ZnO/C framework on reduced graphene oxide sheets for high-performance Li-ion battery anodes, ***Journal of Alloys and Compounds*. Submitted.**
6. **TG Kim†**, Sp An†, SS Yoon*, Flexible heat-spreading and air-cooling films using nickel-electroplated nanotextured fibers, ***Applied Thermal Engineering (IF=4.026)*. Submitted.**
7. 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=6.970)*, 2019.**
8. **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=4.026)***.
9. DH Cho, HS Jo, WJ Lee, **TG Kim**, BH Shin, **SS Yoon***, YD Chung, Enhanced electrical conductivity of transparent electrode using nickel microfiber and silver nanowires hybrid networks for gridless thin-film solar cells, ***Solar Energy Materials and Solar Cells*, 2019.**
10. 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.**
11. 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.**
12. Bhavana Joshi, Edmund Samuel, Min-Woo Kim, Karam Kim, **TG Kim**, Mark T Swihart, Woo Young Yoon, Sam S Yoon, Electrosprayed graphene films decorated with bimetallic (zinc-iron) oxide for lithium-ion battery anodes, ***Journal of Alloys and Compounds (IF=3.779)*, 2019.**
13. **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 Zn_2SnO_4, ***Journal of Alloys and Compounds (IF=4.175)*, 2019), submitted.**
14. **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/TiO_2 Layers for Solar Water Splitting, ***Journal of Alloys and Compounds (IF=4.175)*, 2019.**
15. 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**
16. 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.**
17. 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.**
18. **TG Kim†**, E. Samuel†, B. Joshi, CW Park, MW Kim, WY Yoon*, Sam S. Yoon*, Supersonically Sprayed rGO–Zn_2SnO_4 Composites as Flexible, Binder-free, Scalable, and High-Capacity Lithium Ion Battery Anodes, ***Journal of Alloys and Compounds (IF=3.779)*, 2018.**

19. 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.***
20. 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.**
21. 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.**
22. HS Jo†, **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**.
23. 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**.
24. 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**.
25. HS Jo†, 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**.
26. **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.**
27. **TG Kim†**, JG Lee†, 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=3.450)*, 2018**.
28. JG Lee†, 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.**
29. HS Jo†, JG Lee†, **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.**
30. B Joshi†, JG Lee†, E Samuel, **TG Kim**, WY Yoon*, SS Yoon*, "Supersonically Blown reduced graphene oxide intertwined Fe-Fe_3C nanofibers for lithium ion battery anodes" ***Journal of Alloys and Copounds (IF=3.779), 2017.***
31. E Samuel†, JG Lee†, 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 Copounds (IF=3.133), 2017.***
32. JG Lee†, 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.***
33. JG Lee†, JH Lee†, 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.***
34. JG Lee†, 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 Zn2SnO¬¬4

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**, Supersonically-Sprayed Aerogel and Clay particles as Thermal Barrier Films., Tokyo, Japan, Nov. 4-6th, 2017.
4. **Tae-Gun Kim,** Supersonically-Sprayed Aerogel and Clay Particles as Thermal Barrier Films, The 3rd UIC-KU Conference, Chicago, USA, Apr. 20-21th, 2017
5. **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
6. **Tae-Gun Kim**, The Electrical and Mechanical Properties of kinetic Sprayed Ni-Cu Electrodes, Gwang-Ju, Korea, Mar. 14-15th, 2017.
7. **Tae-Gun Kim**, Supersonic sprayed Fe-Fe_3C 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, Electro-Spinning & Spray.

REFERENCE

- Sam S. Yoon
  Professor
  School of Mechanical Engineering
  Korea University