

YONG IL KIM

DOCTOR COURSE



Solar Cell & Aerosol Science Laboratory

School of Mechanical Engineering

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RESEARCH INTERESTS

- Electrohydrodynamics (electrospinning/electrospray applications)
- Nanofibers (polymer, metal, and ceramic)
- Membrane (water/oil separation, water purification, and biocompatible anti-fungal membrane)
- Photocatalysis applications (water purification, water splitting, and anti-microbial activity)
- Heat transfer applications (air cooling layer, pool boiling, and transparent heater film)
- Self-healing composites
- Metal-organic frameworks (MOFs)
- Transparent conductive electrodes (TCEs)
- Supersonic gas flow
- Secondary batteries (Li-ion battery, supercapacitor)

EDUCATION

- Master course in Mechanical Engineering, (4.05/4.5)
Korea University, Seoul, Korea
Advisor: Prof. Sam S. Yoon
- Bachelor of Science in Mechanical Engineering, Aug. 2015 (3.00/4.5)
Korea University, Seoul, Korea
Advisor: Prof. Sam S. Yoon
Senior Dissertation: Experimental study of nano-textured Cu₂O nanofiber film for efficient air cooling

EMPLOYMENT

- 2016/Sep. 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, Fluid mechanics II.
- 2017/Sep. to 2017/Dec.: Teaching Assistant, School of Mechanical Engineering, Korea University, Fluid mechanics II.

PUBLICATIONS (†equal contribution, *corresponding author)

International Journal Papers (15 published, 4 submitted)

1. 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 Power Sources (IF=6.395), **submitted**.
2. 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), **submitted**.
3. JH Hong[†], S An[†], KY Song, YI Kim, AL Yarin*, JJ Kim*, SS Yoon*, A new approach to prevention of sapstain in wood using electrospun lignin nanofiber film, Journal of Wood Chemistry and Technology (IF=1.549), **submitted**.
4. S An, YI Kim[†], HS Jo, MW Kim, MT Swihart, AL Yarin*, SS Yoon*, Oxidation-Resistant Transparent Conducting Films and Heaters, Acta Materialia (IF=5.301), **submitted**.
5. MW Lee, S An, YI Kim, SS Yoon*, AL, Yarin*, Self-healing three-dimensional bulk materials based on core-shell nanofibers, Chemical Engineering Journal (IF=6.216), 334, 1093-1100, 2018.
6. HS Jo[†], S An[†], XH Nguyen, YI Kim, SC James, J Choi*, SS Yoon*, Modifying capillary pressure and boiling regime of micro-porous wicks textured with graphene oxide, Applied Thermal Engineering (IF=3.043), 128, 1605-1610, 2018.
7. S An, YI Kim, JY Yoon, AL Yarin*, SS Yoon*, Wetting of Inclined Nano-textured Surfaces by Self-healing Agents, Applied Physics Letters (IF=3.411), 111, 234101, 2017
8. EP Samuel[†], BN Joshi[†], HS Jo, YI Kim, MT Swihart, JM Yun, KH Kim*, SS Yoon*, Flexible and freestanding core-shell SnOx/carbon nanofiber mats for high-performance supercapacitors, Journal of Alloys and Compounds (IF=3.133), 728, 1362-1371, 2017.
9. S An, YI Kim, HS Jo, MW Kim, MW LEE, AL Yarin, SS Yoon, Silver-decorated and palladium-coated copper-electroplated fibers derived from electrospun polymer nanofibers, Chemical Engineering Journal (IF=6.216), 327, 336-342, 2017.
10. BN Joshi[†], EP Samuel[†], HS Jo, YI Kim, S Park, MT Swihart, WY Yoon*, SS Yoon*, Carbon Nanofibers Loaded with Carbon Nanotubes and Iron Oxide as Flexible Freestanding Lithium-Ion Battery Anodes, Electrochimica Acta (IF=4.798), 253, 179-488, 2017.
11. S An[†], YI Kim[†], S Sinha-Ray[†], MW Kim, HS Jo, MT Swihart, AL Yarin*, SS Yoon*, Facile processes for producing robust, transparent, conductive platinum nanofiber mats, Nanoscale (IF=7.367), 9, 6076-6084, 2017.

12. S An, **YI Kim**[†], MW Lee, AL Yarin*, SS Yoon*, Wetting coalescence of drops of self-healing agents on electrospun nanofiber mats, *Langmuir* (IF=3.833), 33(40), 10663-10672, 2017
13. EP Samuel[†], HS Jo[†], BH Joshi, HG Park, **YI Kim**, S An, MT Swihart, JM Yun, KH Kim*, SS Yoon*, High-performance supercapacitors using flexible and freestanding MnO_x/carbamide carbon nanofibers, *Applied Surface Science* (IF=3.150), 423, 210-218, 2017.
14. EP Samuel[†], BH Joshi[†], HS Jo, **YI Kim**, S An, MT Swihart, JM Yun, KH Kim*, SS Yoon*, Carbon nanofibers decorated with FeO_x nanoparticles as a flexible electrode material for symmetric supercapacitors, *Chemical Engineering Journal* (IF=6.216), 328, 776-784, 2017.
15. S An, HS Jo, **YI Kim**, KY Song, MW Kim, KB Lee, AL Yarin*, SS Yoon*, Bio-inspired colorful, flexible, defrostable light-scattering hybrid films for effective distribution of LED light, *Nanoscale* (IF=7.760), 9, 9139-9147, 2017.
16. HS Jo[†], MW Kim[†], K Kim, S An, **YI Kim**, SC James, J Choi*, SS Yoon*, Effects of Capillarity on Pool Boiling Using Nanotextured Surfaces through Electrospayed BiVO₄ Nanopillars, *Chemical Engineering Science* (IF=2.750), 171, 360-367, 2017.
17. S An[†], BN Joshi[†], JG Lee[†], MW Lee, **YI Kim**, MW Kim, HS Jo, SS Yoon*, A Comprehensive Review on Wettability, Desalination, and Purification of Graphene at Water Interfaces, *Catalysis Today* (IF=4.312), 295, 14-25, 2017.
18. EP Samuel[†], HS Jo[†], BN Joshi, S An, HG Park, **YI Kim**, WY Yoon*, SS Yoon*, Decoration of MnO nanocrystals on flexible freestanding carbon nanofibers for lithium ion battery anodes, *Electrochimica Acta* (IF=4.803), 231, 582-589, 2017.
19. BN Joshi[†], S An[†], **YI Kim**, EP Samuel, KY Song, IW Seong, SS Al-Deyab, MT Swihart, WY Yoon*, SS Yoon*, Flexible freestanding Fe₂O₃-SnO_x-carbon nanofiber composites for Li ion battery anodes, *Journal of Alloys and Compounds* (IF=3.014), 700, 259-266, 2017.

Conference Papers

1. **YI Kim**, Antioxidant metal microfibers for use as transparent electrodes and heaters, *International Conference on Mechanical & Production Engineering (ICMPE)*, Tokyo, Japan, Nov. 4-6, 2017
2. **YI Kim**, S An, HS Jo, SS Yoon*, Novel platinum nanofibers via electrospinning and electroplating techniques, *Global Photovoltaic Conference (GPVC)*, Gwangju, Republic of Korea, Mar. 15-17, 2017.
3. **YI Kim**, HG Park, HS Jo, S An*, Novel core-shell copper-silver microfibers based on electrospun polymer nanofibers, *International Conference on Mechanical Design and Engineering (ICMDE)*, Hong Kong, Jan. 20-22, 2017.

Patents (6 applied, 4 registered)

1. SG Yoon, S An, HS Jo, **YI Kim**, *Light-scattering plate for LED light and method of manufacturing the same*, 10-2017-0017971 (applied).

SKILLS

- **Technique:** SEM (scanning electron microscopy), EDX (energy dispersive x-ray spectroscopy), TEM (transmission electron microscopy), AFM (atomic force microscopy), XRD (X-ray diffraction), XPS (X-ray photoelectron spectroscopy), FTIR (Fourier transform infrared spectroscopy), Raman spectroscopy, UV-VIS spectrometer, DSC (Differential scanning calorimetry), TGA (thermogravimetric analysis), 4-point probe station, Optical surface profiler, Fluidic properties (viscosity, electrical conductivity, surface tension, dielectric constant)
- **Device fabrication:** electrospinning/electrospray device, electroplating device, supersonic flow nozzle, water contact angle measurement device
- **Design software program:** CATIA, Pro Engineering, AUTO CAD

REFERENCE

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