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EDUCATION

Korea University, Seoul, Korea

Ph.D. candidate in Mechanical Engineering

Prof. Sam Sukgoo Yoon

Korea University, Seoul, Korea

Master of Science Mechanical Engineering, Feb. 2012

Thesis: Experimental study on TiO₂ Thin-film Coating via Aerosol deposition

Prof. Sam Sukgoo Yoon

Hanyang University, Seoul, Korea

Bachelor of Science in Mechanical Engineering, Aug 2004

Yuhan College, Bucheon, Korea

Bachelor of Science in Mechanical Engineering, Feb 2002

Awards

Award for Best Graduate Students (for Ph.D. candidate), Korea University, March, 2014

RESEARCH

Solar cell : Silicon Solar cell(I-Gen.), Thin film Solar cell(II-Gen.), Dye-Sensitized Solar cell(III-Gen.)

Photocatalysis applications : Antibacterial activity, Water purification, Self-cleaning

Materials research : Graphene(TCO, Heat sink), Lithium ion battery(Anode), Ceramic(TiO₂), Metal(Copper)

Thin film coating process : Cold Gas Dynamic Spray (CGDS) & Aerosol Deposition (AD)

PUBLICATION

1. JG Lee, **DY Kim**, JH Lee, MW Kim, S An, HS Jo, C Nervi, SS. Al-Deyab, MT Swihart, SS Yoon*, "Scalable Binder-Free Supersonic Cold Spraying of Nanotextured Cupric Oxide(CuO) Films as Efficient Photocathodes", **ACS Applied Materials Interfaces**, Submitted, 2016
2. JG Lee, **DY Kim**, S An, JH Lee, S Sinha-ray, A Yarin, M Swihart, SS. Al-Deyab, SS Yoon*, "Production of flexible transparent conducting films of self-fused nanowires via one-step supersonic spraying", **Science**, Submitted, 2016
3. B Joshi, JG Lee, **DY Kim**, JH Lee, JS Lee, YK Hwang, JS Chang, SS Al-Deyab, JC Tan*, SS Yoon*. "Tuning Crystalline Structure of Zeolitic Metal–Organic Frameworks by Supersonic Spraying of Nanoparticle Suspension Precursors", **Journal of Aerosol Science**, Submitted, 2016
4. H Yoon, H Kim, **DY Kim**, JG Lee, B Joshi, S An, HS Cho, J Choi, SS Al-Deyab, A Yarin, SS Yoon*, "Water cooling enhancement by means of nano-textured copper, silver, and graphene surfaces", **International Journal of Heat and Mass Transfer**, Submitted, 2015
5. JG Lee, **DY Kim**, B Joshi, JH Lee, TK Lee, JS Lee, DH Yang, SS Al-Deyab, SS Yoon*, "Electrically insulative performances of ceramic and clay films deposited via supersonic spraying", **Journal of Thermal Spray Technology**, 2016, accepted
6. S An, **DY Kim**, JG Lee, HS Jo, MW Kim, SS Al-Deyab, J Choi*, SS Yoon*, "Supersonically sprayed reduced graphene oxide film to enhance critical heat flux in pool boiling", **International Journal of Heat and Mass Transfer**, 98, pp124-130, 2016
7. **DY Kim**, B Joshi, JG Lee, JH Lee, JS Lee, YK Hwang, JS Chang, SS. Al-Deyab, JC Tan, SS Yoon*, "Scalable Supersonic Cold Spraying for Zeolitic Metal-Organic Framework Thin Films", **Chemical Engineering Journal**, 295, pp49-56, 2016
8. **DY Kim**, JG Lee, B Joshi, JH Lee, SS. Al-Deyab, HG Yoon, DR Yang, A Yarin, SS Yoon*, "Supersonically sprayed thermal barrier layers using clay micro-particles", **Applied Clay Science**, 120, pp142-143, 2016
9. JG Lee, **DY Kim**, MG Mali, SS Al-Deyab, MT Swihart, SS Yoon*, "Supersonically blown nylon-6 nanofibers entangled with graphene flakes for water purification", **Nanoscale**, 7, pp19027-19035, 2015
10. KD Lee, MJ Park, **DY Kim**, SM Kim, BJ Kang, ST Kim, HH Kim, HS Lee*, YM Kang*, SS Yoon, BH Hong, DH Kim*, Graphene Quantum Dot Layers with Energy-Down-Shift Effect on Crystalline-Silicon Solar Cells, **Applied Materials&Interfaces**, 7 (34), pp19043–19049 2015
11. JG Lee, **DY Kim**, B Kang, D Kim, SS Al-Deyab, S James, SS Yoon*, "Thin film metallization process by supersonic spraying copper nickel nanoparticles on a silicon substrate", **Computational Materials Science**, 108, Part A, pp114-120, 2015

12. JG Lee, YH Cha, **DY Kim**, JH Lee, SC James, SS. Al-Deyab, TK Lee, WY Kim, SS Yoon*, "Robust mechanical properties of electrically insulative alumina films by supersonic aerosol deposition", *Journal of Thermal Spray Technology*, 24, 6, pp1046-1051, 2015
13. JG Lee, **DY Kim**, B Kang, D Kim, HE Song, J Kim, W Jung, D Lee, SS Al-Deyab, SC James, SS Yoon*, "Nickel-copper hybrid electrodes self-adhered onto silicon wafer by supersonic cold-spray", *ACTA MATERIALIA*, 93, pp156-163, 2015
14. **DY Kim**, JG Lee, BN Joshi, SS Latthe, SS Al-Deyab, SS Yoon*, "Self-cleaning superhydrophobic films by supersonic-spraying polytetrafluoroethylenetitanania nanoparticles", *Journal of Material Chemistry A*, 3, pp 3975-3983, 2015
15. JG Lee, **DY Kim**, JJ Park, YH Cha, JY Yoon, HS Jeon, BK Min, M Swihart, SH Jin, SA-Deyab, SS Yoon*, "Graphene-titania hybrid photoanodes produced by supersonic kinetic aerosol deposition for solar water splitting", *Journal of the American Ceramic Society*, 97(11) pp 3660-3668, 2014
16. **DY Kim**, S Sinha-Ray, JJ Park, AL Yarin, JH Ahn, SS Yoon*, "Self-healing reduced graphene oxide films by supersonic kinetic spraying", *Advanced Functional Materials*, 24(31) pp 4986-4995, 2014.
17. **DY Kim**, B N. Joshi, JJ Park ,JG Lee, YH Cha, TY Seong, SI Noh, HJ Ahn, SS. Yoon, "Graphene-titania films by supersonic kinetic spraying for enhanced performance of dyesensitized solar cells", *Ceramics International*, 40(7), pp 11089-11097, 2014
18. JJ Park, **DY Kim**, JG Lee, M Swihart, SS Yoon, "Supersonic Aerosol-Deposited TiO₂ Photoelectrodes for Photoelectrochemical Solar Water Splitting", *RSC Advances*, 4, pp 8661-8670, 2014
19. **DY Kim**, JJ Park, JG Lee, HY Kim, DH Kim, SJ Tark, SJ Ahn, JH Yun, JH Gwak, S Chandra, KH Yoon, SS Yoon, "Cold Spray Deposition of Copper Electrodes on Silicon and Glass Substrates" *Journal of Thermal Spray Technology*, 22(7), pp. 1092-1102, 2013
20. **DY Kim**, JJ Park, JG Lee, M van Hest, SS Yoon*, "Wettability and photocatalysis of CF₄ plasma etched titania films of honeycomb structure", *Ceramics International*, 39, pp. 9737-9742, 2013
21. AB Gurav, SS Latthe, RS Vhatkar, JG Lee, **DY Kim**, JJ Park, SS Yoon, "Superhydrophobic surface decorated with vertical ZnO nanorods modified by stearic acid", *Ceramics International*, 40(5), pp 7151-7160, 2014
22. JJ Park, **DY Kim**, SS Latthe, JG Lee, M Swihart, SS Yoon*, "Thermally Induced Superhydrophilicity in TiO₂ Films Prepared by Supersonic Aerosol Deposition", *ACS Applied Materials & Interfaces*, 5, pp. 6155-6160, 2013
23. JJ Park, **Do-Yeon Kim**, Jong-Gun Lee, Donghwan Kim, Joon-Ho Oh, Tae-Yeon Seong, Maikel F.A.M. van Hest, SS Yoon*, "Superhydrophilic Transparent Titania Films by Supersonic Aerosol Deposition", *Journal of the American Ceramic Society*, 96(5), pp. 1596-1601, 2013
24. JJ Park, JG Lee, **DY Kim**, JH Hong, JJ Kim, SK Hong, and SS Yoon*, "Antibacterial and Water Purification Activities of Self-Assembled Honeycomb Structure of Aerosol Deposited Titania Film", *Environmental Science & Technology*, 46,

pp. 12510-12518, 2012

25. **DY Kim**, JJ Park, JG Lee, MW Lee, JH Oh, TY Seong, DH Kim, SC James, MF Hest, S Chandra, SS Yoon*, "Tuning Hydrophobicity with Honeycomb Surface Structure and Hydrophilicity with CF₄ Plasma Etching for Aerosol-Deposited Titania Films", *Journal of the American Ceramic Society*, 95(12), pp. 3955-3961, 2012
26. MW Lee, JJ Park, **DY Kim**, SS Yoon*, HY Kim, SC James, S Chandra, JH Ryu, WH Yoon, DS Park, "Optimal Supersonic Nozzle Conditions for Thin-Film Coating by Aerosol Deposition", *Journal of Aerosol Science*, 42, pp. 771-780, 2011
27. MW Lee, JJ Park, **DY Kim**, SS Yoon, HY Kim, SC James, S Chandra, T Coyle, "Numerical studies on the effects of stagnation pressure and temperature on supersonic flow characteristics in cold spray applications", *Journal of Thermal Spray Technology*, 20(5), September, pp. 1085-1097, 2011

PROCEEDING / CONFERENCE PAPERS

1. JG Lee, **DY Kim**, SS Yoon*, "Nickel-copper hybrid electrodes self-adhered onto silicon wafer by supersonic cold-spray", ASME-JSME-KSME Joint Fluids Engineering Conference, Seoul, Korea, Jul. 26-31, 2015
2. SS Yoon*, JG Lee, **DY Kim**, "Nickel-copper electrodes onto a silicon wafer by cold spray coating process", Korea Photovoltaic Society, Busan, Korea, Apr. 29-30, 2015
3. JJ Park, JG Lee, **DY Kim**, M Liou, SS Yoon*, "Kinetically metallized carbon-free CuInGaSe₂ solar cell by supersonic spraying dry nanoparticles", The 6th World Conference on Photovoltaic Energy Conversion(WCPEC-6), Kyoto, Japan, Nov. 23-27, 2014
4. JJ Park, **DY Kim**, JG Lee, YH Cha, S S. Yoon*, Tuning Hydrophobicity Using Cold Sprayed Teflon_Titania Composite Thin Films, Global Photovoltaic Conferences 2013 (GPVC 2013), Busan, Korea, Nov. 23-26, 2013
5. JJ Park, **DY Kim**, JG Lee, YH Cha, S S. Yoon*, Titania Composite Thin Films for Acute Inkjet Printing, Global Photovoltaic Conferences 2013 (GPVC 2013), Busan, Korea, Nov. 23-26, 2013
6. JJ Park, **DY Kim**, JG Lee, S S. Yoon*, Solution Precursor Graphene Coating by Cold Spray, KSME (The Korea Society of Mechanical Engineers), Jeju, Korea, May, 9-10, 2013
7. **DY Kim**, JJ Park, JG Lee, S S. Yoon*, Fabrication of CISSe Thin Film Solar Cell via Cold Spray, KPVC (Korea Photovoltaic Society 2013), Suwon, Korea, Apr, 29-30, 2013
8. JG Lee, JJ Park, **DY Kim**, SS Yoon*, "Low-cost Copper-based Front Electrode Manufacture for Crystalline Silicon and CIS Solar Cells by Cold Spray", Global Photovoltaic Conference 2012(GPVC 2012), Pusan, Korea, November , 19-21, 2012
9. JJ Park, **DY Kim**, SS Yoon*, "Characteristics of copper powder coating by Low-pressure cold spray", Global

Photovoltaic Conference 2011(GPVC 2011), Pusan, Korea, September, 28-30, 2011

10. MW Lee, JJ Park, DK Kang, **DY Kim**, SS Yoon*, The 23rd ILASS-AMERICAS 2011, Ventura, California, USA, May 15-18, 2011
11. **DY Kim**, MW Lee, JJ Park, SS Yoon*, and HY Kim, OPTIMIZATION OF SUPERSONIC NOZZLE FLOW FOR THIN-FILM COATING BY AEROSOL DEPOSITION, The Korea Society of Mechanical Engineers, POSTECH, Pohang, Korea, April 24-29, 2011

Note: (*), corresponding author

PATENT

JJ Park, **DY Kim**, SS Yoon, "Aerosol particle supplying apparatus and aerosol deposition apparatus using the same" 10-1209349

JJ Park, **DY Kim**, MW Lee, SS Yoon, DH Kim, "Apparatus for cold spraying grid line on a solar cell substrate", 10-1217304

DY Kim, JJ Park, SS Yoon, "Apparatus for cold spraying inorganic layers on a solar cell substrate", 10-1217330

MY Lee, **DY Kim**, JJ Park, SS Yoon, MJ Ko, "Apparatus for coating blocking layer for DSSC and method for using the same", 10-1202827

MW Lee, JJ Park, **DY Kim**, SS Yoon, "Apparatus for manufacturing solar cell substrate and method for controlling the same", 10-2011-0060846

MW Lee, JJ Park, **DY Kim**, SS Yoon, "Apparatus for spraying grid line and passivation layer on a solar cell substrate", 10-2011-0060847

MW Lee, **DY Kim**, DK Kang, JJ Park, SS Yoon, "Electrospinning Apparatus", 10-2011-0104222

SS Yoon, JG Lee, **DY Kim**, JJ Park, MW Lee, "Apparatus for manufacturing a solar cell substrate with cold spraying and method for controlling the same", PCT-KR-2012-972, pending..

MW Lee, **DY Kim**, JJ Park, SS Yoon, "Electrospinning apparatus with supersonic stream nozzle", 10-2012-0029142

SS Yoon, KH Yoon, JJ Park, **DY Kim**, JG Lee, JH Gwak, JH Yun, SJ Ahn, Ara Cho, KS Shin, "Grid electrode for solar cell, fabrication method an apparatus of grid electrode", 10-2012-0124609

JJ Park, SS Yoon, **DY Kim**, "Apparatus for Coating Graphene Film Using Cold Spray", 10-2013-0002613

SKILLS

Device fabrication: Aerosol deposition, Cold spray thin film deposition

Measurement techniques: Atomic force microscopy(AFM), Scanning electron microscopy(SEM), X-ray diffraction(XRD), UV-vis spectrophotometer, Schlieren method, Dynamic water contact angle measurement, Fourier Transform Infrared Spectroscopy (FTIR)

Computational simulation: Computational Fluid Dynamics (Fluent, Gambit)

Computer Proficiency: Windows 98 - Window 7, MS – Office 2003 - 2010, Origin 8

Certification

Atomic force microscopy (AFM) Basic User Training , Park systems Corp , 2014

Reference

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