

Ph.D. candidate

JUNG-JAE PARK



Solar Cell and Aerosol Science Lab.

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EDUCATION

Korea University, Seoul, Korea

Cumulative : 4.03/4.5

Ph.D. candidate in Mechanical Engineering, advisor: Prof. Sam S. Yoon, 2008-2014(expected)

Myongji University, Seoul, Korea

Cumulative : 3.56/4.5

Bachelor of Science in Mechanical Engineering, 2003-2008

Dealim College, Anyang, Korea

Cumulative : 3.3/4.5

Bachelor of Science in Mechanical Engineering, 2001-2003

AWARDS

Outstanding Graduate Student Award(for PhD candidate), Korea University, April, 2011

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)

PUBLICATIONS

JJ Park, SS Latthe, DY Kim, JG Lee, M Swihart, SH Jin, SS Yoon, "Significantly Enhanced Photoelectrochemical Water Splitting by Supersonic Aerosol Deposited Graphene-TiO₂ Nanocomposites", *Carbon*, 2013 **under review**

SS Latthe, **JJ Park**, DY Kim, M Swihart, SS Yoon, "Aerosol-Deposited TiO₂ Photoelectrodes for Photoelectrochemical Solar Water Splitting", *Acta Materialia*, 2013 **under review**

DY Kim, S Sinha-Ray, **JJ Park**, AL Yarin, JH Ahn, SS Yoon*, "Supersonic Blowing: Facile and Industrially Scalable Method for Producing Self-Healing r-GO Films", *Carbon*, 2013 **under review**

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

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*, 95(12), pp. 3955-3961, 2012

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*, accepted, 2013

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, Cited by 1

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, Cited by 2

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, 3955-3961, 2012, Cited by 1

MW Lee, **JJ Park**, Massoud Massoudi Farid, SS Yoon*, "Comparison and correction of the drop breakup models for stochastic dilute spray flow", *Applied Mathematical Modeling*, 36, pp. 4512-4520, 2012, Cited by 2

MW Lee, **JJ Park**, DY Kim, SS Yoon*, HY Kim, SC James, S Chandra, JH Ryu, WH Yoon, DS Park, "Optimization of supersonic nozzle flow for titanium dioxide thin-film coating by aerosol deposition", *Journal of Aerosol Science*, 42, pp. 771-780, 2011, Cited by 4

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, Cited by 2

JJ Park, MW Lee, SS Yoon*, HY Kim, SC James, SD Heister, S Chandra, WH Yoon, DS Park, JH Ryu, "Supersonic nozzle flow simulations for particle coating applications: Effects of shockwaves, nozzle geometry, ambient pressure, and substrate location upon flow characteristics", *Journal of Thermal Spray Technology*, 20(3), March, pp. 514-522, 2011, Cited by 5

Note: ()*, corresponding author

PRESENTATIONS

JJ Park, DY Kim, JG Lee, SS Yoon, Solution Precursor Graphene Coating by Cold Spray, *KSME (The Korea Society of Mechanical Engineers)*, Jeju, Korea, May, 9-10, 2013

DY Kim, **JJ Park**, JG Lee, SS Yoon, Fabrication of CISSe Thin Film Solar Cell via Cold Spray, *KPVC (Korea Photovoltaic Society 2013)*, Suwan, Korea, Apr, 29-30, 2013

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, *GPVC (Global Photovoltaic Conference 2012)*, Pusan, Korea, Aug, 27-29, 2012

MW Lee, **JJ Park**, DK Kang, DY Kim, *The 23rd ILASS-AMERICAS 2011*, Ventura, California, USA, May 15-18, 2011

DY Kim, MW Lee, **JJ Park**, SS Yoon*, and HY Kim, OPTIMIZATION OF SUPERSONIC NOZZLE FLOW FOR THIN-FILM COATING BY AEROSOL DEPOSITION, *KSME (The Korea Society of Mechanical Engineers)*, POSTECH, Pohang, Korea, April 24-29, 2011

JJ Park, SS Yoon*, HY Kim, Numerical study on the effects of nozzle geometry and substrate location in the supersonic flow, *KSNRE (Annual Spring Meeting of The Korean Society for New & Renewable Energy 2010)*, Mokpo, Korea, June 17-19, 2010

MW Lee, **JJ Park**, SS Yoon*, HY Kim, SC James, S Chandra, JH Ryu, WH Yoon, DS Park, SIMULATION OF AEROSOL DEPOSITION SUPERSONIC NOZZLE FLOW FOR APPLICATIONS IN NANO-PARTICLE COATING AT ROOM TEMPERATURE, *Renewable Energy 2010*, Yokohama, Japan, June 27-July 2, 2010.

IH Hwang, DJ Lee, SS Yoon*, HY Kim, MW Lee, **JJ Park** and SC James, SPLASHING CHARACTERISTICS OF MONODISPERSE SPRAYS WITH SIGNIFICANT VISCOSITY DIFFERENCES IMPACTING A FLAT SURFACE, *The 6th Asia-Pacific Drying Conference*, Bangkok, Thailand, Oct. 19-21, 2009.

Note: ()*, corresponding author

PATENT

JJ Park, DY Kim, SS Yoon, "에어로졸 입자 공급장치 및 이를 이용한 에어로졸 증착 장치, Aerosol particle supplying apparatus and aerosol deposition apparatus using the same", 등록번호 10-1209349

JJ Park, DY Kim, MW Lee, SS Yoon, DH Kim, "태양전지 도선 전극 제조 장치, Apparatus for cold spraying grid line on a solar cell substrate", 등록번호 10-1217304

DY Kim, **JJ Park**, SS Yoon, "무기물 박막 태양전지 제조 장치, Apparatus for cold spraying inorganic layers on a solar cell substrate", 등록번호 10-1217330

MY Lee, DY Kim, **JJ Park**, SS Yoon, MJ Ko, "염료감응형 태양전지 에어로졸 증착 장치 및 이를 사용한 에어로졸 증착 방법, Apparatus for coating blocking layer for DSSC and method for using the same", 등록번호 10-1202827

MW Lee, **JJ Park**, DY Kim, SS Yoon, "태양전지 제조 장치 및 이의 제어 방법, Apparatus for manufacturing solar cell substrate and method for controlling the same", 등록번호 10-1242299

MW Lee, **JJ Park**, DY Kim, SS Yoon, "태양전지 전극 및 패시베이션층 제조 장치, Apparatus for spraying grid line and passivation layer on a solar cell substrate", 등록번호 10-1242352

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

SS Yoon, JG Lee, DY Kim, **JJ Park**, MW Lee, "무기물 박막 태양전지 제조 장치 및 이의 제어 방법, 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, "전기 방사 장치, Electrospinning apparatus with supersonic stream nozzle", 출원번호

10-2012-0029142

MW Lee, SP An, **JJ Park**, SS Yoon, “항균 코팅층 형성 장치, Coating apparatus of anti-bacterial coating layer using electrospinning and electrostatic spray depositioning method”, 출원번호 10-2012-0072899

SS Yoon, KH Yoon, **JJ Park**, DY Kim, JG Lee, JH Gwak, JH Yun, SJ Ahn, Ara Cho, KS Shin, “태양전지용 그리드전극, 그리드 전극 형성 방법 및 형성 장치, Grid electrode for solar cell, fabrication method an apparatus of grid electrode”, 출원번호 10-2012-0124609

JJ Park, SS Yoon, DY Kim, “저온 스프레이 방식 그래핀 증착 장치, Apparatus for Coating Graphene Film Using Cold Spray”, 출원번호 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

Engineer General Machinery, Human Resources Development Service of Korea, 2007

Engineer Construction Equipment, Human Resources Development Service of Korea, 2008

OPIc, Intermediate Low – English, 2012-03-29

Reference

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Aforesaid information is true to the best of my knowledge and belief.

(Jung Jae Park)