Wonjoon Choi

Professor, School of Mechanical Engineering, Korea University

Chief, KU Makerspace

316, Innovation Hall, Korea University, Anamdong, 5-Ga, Sungbuk-Gu, Seoul, Korea, 02841

Phone: 82-2-3290-5951 ; Email : wojchoi@korea.ac.kr

EDUCATION

- **Ph.D Degree, Department of Mechanical Engineering, Massachusetts Institute of Technology (MIT), Aug 2007 – Jan 2012**
- **Bachelor of Engineering Degree in Mechanical & Aerospace Engineering, Seoul National University (SNU), Mar 1999‑ Feb 2003**

PROFESSIONAL EXPERIENCES

- **Chief, KU Makerspace, Korea University, Jan 2022 – Present**
- **Professor, School of Mechanical Engineering, Korea University, Sep 2022 – Present**
- **Associate Professor, School of Mechanical Engineering, Korea University, Sep 2017 – Aug 2022**
- **Assistant Professor, School of Mechanical Engineering, Korea University, Sep 2012 – Aug 2017**
- **Joint Postdoctoral Fellow, Department of Chemical Engineering and Department of Materials Science and Engineering, Massachusetts Institute of Technology (MIT), Feb 2012 – Aug 2012**
- **R & D Center, Platform Development Team Assistant Engineer, KEBTechnology Co.,Ltd., Jul 2004 – Apr 2006**
- **R & D Center Engineer, CyberCVS Co.,Ltd., Mar 2003 – Jun 2004**

TEACHING EXPERIENCES

- **Undergraduate-level Course: Heat Transfer, Applied Heat Transfer, Numerical Analysis, Applied Fluid Mechanics, Computer Language and Lab, Engineering Mathematics 1, Creative Design**
- **Graduate-level Course: Advanced Heat Transfer, Advanced Thermodynamics**
- **International Course: Heat Transfer**

RESEARCH INTEREST

- **Structure-Guided Thermal Waves (SGTWs) driven Thermal-Chemical-Electrical Energy Conversion for Energy Applications**
  - Active manipulation of materials via thermal/electrical waves: Facile one-pot transformation of phase/surface/porosity/composition with controlled organic layer coating for metal/metal oxides/carbon for energy application (supercapacitor, battery)
  - Thermopower waves in SGTWs: Electrical energy generation utilizing thermo-chemically induced charge transport through hybrid materials
- **Multiscale Platforms for Active Control of Thermal & Fluidic Transport and Their Applications**

- Multiscale-textured surfaces and structures for phase change heat transfer: Design of multi-porous structures for further controls of heat transfer coefficient and critical heat flux
- Fluidic transport through nanopores and nanochannels: Fabrication of nanopore-channel platforms and study of underlying physics of ion transport for mass transport and nanofluidic sensing applications

- **Self-Sustained Thermal-Fluidic Sensing Platform (Energy Harvesting and Sensors)**
  - Dual-function sensors for electrical energy generation and sensing of thermal-fluidic transport phenomena: Thermolelectrics, pyroelectrics, triboelectrics, piezoelectrics
  - Applications to various chemical-physical sensors with self-powered functions: Fluid temperature-flow sensors, wearable sensors, pH sensors, fluid dynamics and others

- **Multi-Functional Thermal Metamaterials for Local Heat Flux Manipulation**
  - Tunable-multifunctional-reconfigurable thermal metamaterials: Assembly design of unit-cells components with diverse thermal functions in macroscale and fabrication in 2D and 3D structures
  - Applications of thermal metamaterials for local heat flux manipulation: Thermal energy focusing-dissipating-diffusing-rotating using hybrid structures

- **Thermal Analysis of Multiphysics-Multiscale Systems**
  - Hybrid analysis of multiscale systems including thermal transport: Photo-thermal, thermal-electrical, chemical-thermal-electrical energy conversion
  - Applications to multiphysics-multiscale systems: Super resolution near-field structure for nanolithography systems, solid-oxide fuel cells, thermoelectrics, and planar heating element

PUBLICATION LIST

• Journal Publication

1. **Choi. W.**; Hong. S.; Abrahamson. J. T.; Han. J. -H.; Song. C.; Nair. N.; Baik. S.; Strano. M. S. "Chemically Driven, Carbon Nanotube-Guided Thermopower Waves", ***Nature Materials*** **2010**, 9, 423-429

2. Lee. C.Y.; **Choi. W.**; Han, J –H.; Strano. M. S. "Coherence Resonance in Single-Walled Carbon Nanotube Ion Channel", ***Science*** **2010**, 329, 1320-1324

3. **Choi. W.**; Abrahamson. J. T.; Strano. J. M.; Strano. M. S. "Carbon Nanotube-Guided Thermopower Waves", ***Materials Today*** **2010**, 13(10), 22-23

4. Ham. M. H.; Paulus. G. L. C.; Lee. C. Y.; Song. C.; Kalantar-Z. K.; **Choi. W.**; Han. J. -H.; Strano. M. S. "Evidence for High Efficiency Exciton Dissociation at the polymer/Single Walled Carbon Nanotube Interfaces in Planar Nano-Heterojunction Photovoltaics", ***ACS Nano*** **2010**, 4, 6251-6259

5. **Choi. W.**; Lee. C.Y.; Ham. M. H.; Shimizu. S.; Strano. M. S. "Dynamics of Simultaneous, Single Ion Transport through Two Single-Walled Carbon Nanotubes: observation of a three-state system", ***Journal of the American Chemical Society*** **2011**, 133 (2), 203-205

6. Abrahamson. J. T.; **Choi. W.**; Schonenbach, N. S.; Park. J.; Han. J. -H.; Walsh. M. P.; Kalantar-Z. K.; Strano. M. S. "Wave Front Velocity Oscillation of Carbon Nanotube-Guided Thermopower Waves:Nanoscale Alternating Current Sources", ***ACS Nano*** **2011**, 5 (1), 367-375

7. Abrahamson. J. T.; Song. C.; Hu. J. H.; Forman. J. H.; Mahajan. S. G.; Nair. N.; **Choi. W.**; Lee. EJ. Strano. M. S. "Synthesis and Energy Release of Nitrobenzene-Functionalized Single-Walled Carbon Nanotubes", ***Chemistry of Materials*** **2011**, 23 (20), 4557-4562

8. Shimizu. S.; **Choi. W.**; Abrahamson. J. T.; Strano. M. S. "New concepts in molecular and energy transport within carbon nanotubes: Thermopower waves and stochastically resonant ion channels", ***Physica Status Solidi B-Basic Solid State Physics*** **2011**, 248 (11), 2445-2448

9. **Choi. W.**; Hong. J.; "Rapid Electromechanical Transduction on a Single-Walled Carbon Nanotube Film: Sensing Fast Mechanical Loading via Detection of the Electrical Signal Change", ***Industrial & Engineering Chemistry,*** **2012**, 51 (45), 14714–14721

10. Abrahamson. J. T.; Sempere. B.; Walsh. P. M.; Forman. J. M.; Sen. F.; Sen. S.; Mahajan. G. S.; Paulus. L. G; **Choi. W.**; Strano. M. S. "Excess thermopower and the theory of thermopower waves ", ***ACS Nano*****, 2013,** 7(8), 6533-6544

11. **Choi. W.**; Ulissi. Z.; Shimizu. S.; Bellisario. D.;Ellison. M.; Strano. M. S. "Diameter Dependent Ion Transport through the Interior of Single Isolated Single Walled Carbon Nanotubes", ***Nature Communications*****, 2013,** 4, 2397

12. Lee. K.Y.; Hwang. H.Y.; **Choi. W.***; "Advanced Thermopower Wave in Novel ZnO Nanostructures/Fuel Composite", ***ACS Applied Materials & Interfaces,*** **2014,** 6 (17), 15575-15582

13. Hwang. H.Y.; Yeo. T.H.; Um. J.E.; Lee. K.Y.; Kim. H.S.; Han. J.H.; Kim. W.J. ; **Choi. W.***; "Investigation of Effect of the Structure of Large-Area Carbon-Nanotube/Fuel Composites on Energy Generation from Thermopower Waves", ***Nanoscale Research Letters,*** **2014,** 9, 536

14. Yeo. T.H.; Hwang. H.Y.; Lee. D.C.; Lee. K.Y.; Hong. J.S, Song, C.; **Choi. W.***; "Effects of Chemical Fuel Composition on Energy Generation from Thermopower Waves", ***Nanotechnology,*** **2014,** 25, 445403

15. Seo. G.H.; Hwang. H.Y.; Yoon. J.W.; Yeo. T.H.; Son. H.H.; Jeong U.; Jeun. G.D.; **Choi. W.*;** Kim. S.J.*; "Enhanced Critical Heat Flux with Single-Walled Carbon Nanotubes Bonded on Metal Surfaces", ***Experimental Thermal and Fluid Science,*** **2015,** 60, 138-147

16. Kim. B.Y.; Kim. H.C.; Yoon. K.J.; Lee. J.H.; Kim. B.K.; **Choi. W.**; Lee. J.H.; Hong. J.S*; "Reactions and Mass Transport in High Temperature Co-Electrolysis of Steam/CO2 Mixtures for Syngas Production", ***Journal of Power Sources,*** **2015,** 280, 630-639

17. Lee. K.Y.‡; Hwang. H.Y.‡; Shin. D.J.; **Choi. W.***; "Enhanced Thermopower Wave via Nanowire Bonding and Grain Boundary Fusion in Combustion of Fuel/CuO-Cu2O-Cu Hybrid Composites", ***Journal of Materials Chemistry A,*** **2015,** 3, 5457-5466

18. Hwang. H.Y.‡; Yeo. T.H.‡; Cho. Y.H.; Shin. D.J.; **Choi. W.***; "Preparation and Evaluation of Hybrid Composites of Chemical Fuel and Multi-Walled Carbon Nanotubes in the Study of Thermopower Waves", ***Journal of Visualized Experiments,*** **2015,** 98, e52818

19. Yeo. T.H.; Hwang. H.Y.; Cho. Y.H.; Shin. D.J.; **Choi. W.***; "Voltage Amplification of Thermopower Waves via Current Crowding at High Resistances in Self-Propagating Combustion Waves", ***Nanotechnology,*** **2015,** 26, 305402

20. Lee. K.Y.; Hwang. H.Y.; **Choi. W.***; "Phase Transformation of Cobalt Oxide in CoxOy-ZnO Multi-Pod Nanostructures via Combustion from Thermopower Waves", ***Small,*** **2015,** 11 (36), 4762-4773

21. Lee. K.Y.; Hwang. H.Y.; Shin. D.J.; **Choi. W.***; "Manipulation of Combustion Waves in Carbon-

Nanotube/Fuel Composites by Highly Reactive Mg Nanoparticles", ***Nanoscale,* 2015,** *7*, 17071-17078

22. Hwang. H.Y.; Lee. K.Y.; Yeo. T.H.; **Choi. W.***; "Investigation of Structural–Chemical Transition of Copper Oxide Microstructures from Combustion Waves in Fuel/CuO–Cu2O–Cu Hybrid Composites", ***Applied Surface Science,* 2015,** 359, 931-938

23. Cho. E.; Park. G.W.; Lee. J.W.; Cho. S.M.; Kim T.; Kim. J.; **Choi. W.***; Ohm. W.S.; Kang. S.*; "Effect of alumina composition and surface integrity in alumina/epoxy composites on the ultrasonic attenuation properties", ***Ultrasonics,* 2016,** 66, 133-139

24. Um. J.E.; Yeo. T.H.; **Choi. W.**; Chae. J.S; Kim. H.S.; Kim. W.J.*; "Enhanced energy release from carbon nanotube-energetic material composites", ***Science of Advanced Materials,* 2016, *8***, 164-170

25. Lee. K.Y.; Hwang. H.Y.; Kim. T.H.; **Choi. W.***; "Enhanced Photocatalytic Activity of Bismuth Precursor by Rapid Phase and Surface Transformation Using Structure-Guided Combustion Waves", ***ACS Applied Materials & Interfaces,* 2016,** 8 (5), 3366-3375

26. Lee. S.H.; Kim. H.C.; Yoon. K.J.; Son. J.W.; Lee. J.H.; Kim. B.K.; **Choi. W.**; Yoon. K.J.; Hong. J.S*; "The Effect of Fuel Utilization on Heat and Mass Transfer within Solid Oxide Fuel Cells Examined by Three-Dimensional Numerical Simulations", ***International Journal of Heat and Mass Transfer,* 2016,** 97, 77-93

27. Shin. J.H.; Lee. K.Y.; Yeo. T.H.; **Choi. W.***; "Facile One-pot Transformation of Iron Oxides from Fe2O3 Nanoparticles to Nanostructured Fe3O4@C Core-Shell Composites via Combustion Waves", ***Scientific Reports,* 2016,** 6, 21792

28. Park. G.W.‡; Lee. J.H.‡; Kang. S.G.; Kim. M.S.; Kang. S.* ; **Choi. W.***; " Design Principle of Super Resolution Near-Field Structure Using Thermally Responsive Optical Phase Change Materials for Nanolithography Applications", ***Materials & Design,* 2016,** 102, 45-55

29. Lee. S.H.‡; Seo. G.H.‡; Lee. S.H.; Jeong. U.J.; Lee. S.J.; Kim. S.J.* ; **Choi. W.***; "Layer-by-Layer Carbon Nanotube Coatings for Enhanced Pool Boiling Heat Transfer on Metal Surfaces", ***Carbon,* 2016,** 107, 607-618

30. Shin. D.J.; Hwang. H.Y.; Yeo. T.H.; Seo. B.S.; **Choi. W.***; "Thermopower Wave-driven Hybrid Supercapacitor Charging System", ***ACS Applied Materials & Interfaces,* 2016,** 8 (45), 31042-31050

31. Yeo. T.H. Hwang. H.Y.; Shin. D.J.; Seo. B.S.; **Choi. W.***; "Thermoelectric-Pyroelectric Hybrid Energy Generation from Thermopower Waves in Core-Shell Structured Carbon Nanotube-PZT Nanocomposites", ***Nanotechnology,* 2017,** 28, 065403

32. Lee. S.J.; Kang. J.Y.; **Choi. W.***; Kwak. R.K.*; "Nanopore Sensing in Aqueous Two-Phase System: Simultaneous Enhancement of Signal and Translocation Time via Conformal Coating", ***Small,* 2017,** 13, 1601725 **(Inside Front Cover)**

33. Park. G.W.‡; Kang. S.G.‡; Lee. H.W.; **Choi. W.***; "Tunable Multifunctional Thermal Metamaterials: Manipulation of Local Heat Flux via Assembly of Unit-Cell Thermal Shifters", ***Scientific Reports,* 2017,** 7, 41000

34. Lee. S.H.; Park. M.S.; Kim. H.C.; Yoon. K.J.; Son. J.W.; Lee. J.H.; Kim. B.K.; **Choi. W.**; Hong. J.S.*; "Thermal Conditions and Heat Transfer Characteristics of High-Temperature Solid Oxide Fuel Cells Investigated by Three-Dimensional Numerical

Simulations", ***Energy,* 2017,** 120, 293-305

35. Hwang. H.Y.; Shin. D.J.; Yeo. T.H.; **Choi. W.***; "Amplified Thermopower Waves in Large-Area Carbon-Nanotube/Fuel Composites via Thermal Decomposition of Sodium Nitrate", ***Advanced Materials Interfaces,* 2017,** 4, 160098

36. Shin. D.J.‡; Seong. T.H.‡; Choi. J.H.*; **Choi. W.***; "Self-Sustaining Water-Motion Sensor Platform for Continuous Monitoring of Frequency and Amplitude Dynamics", ***Nano Energy,* 2017,** 35, 179

37. Shin. J.H.‡; Shin. D.J.‡; Hwang. H.Y.; Yeo. T.H.; Park. S.H.; **Choi. W.***; "One-Step Transformation of MnO2 into MnO2–x@Carbon Nanostructures for High-Performance Supercapacitors using Structure-Guided Combustion Waves", ***Journal of Materials Chemistry A,* 2017,** 5, 13488

38. Yeo. T.H.; Shin. D.J.; Shin. J.H.; Hwang. H.Y.; Seo. B.S.; Lee. J.H.; **Choi. W.***; "DC-field-driven combustion wave for one-step fabrication of reduced manganese oxide/multi-walled carbon nanotube hybrid nanostructures as high-performance supercapacitor electrodes", ***Journal of Materials Chemistry A*, 2017,** 5, 24707

39. Hwang. H.Y.; Shin. J.H.; Lee. K.Y.*; **Choi. W.***; "Facile one-pot transformation using structure-guided combustion waves of micro-nanostructured β-Bi2O3 to α-Bi2O3@C and analysis of electrochemical capacitance", ***Applied Surface Science*, 2018**, 428, 422-431

40. Shin. D.J.‡; Shin. J.H.‡; Yeo. T.H.; Hwang. H.Y.; Park. S.H.; **Choi. W.***; "Scalable Synthesis of Triple-Core-Shell Nanostructures of TiO2@MnO2@C for High Performance Supercapacitors using Structure-Guided Combustion Waves", ***Small*, 2018,** 14, 1703755

41. Hwang. H.Y.; Lee. K.Y.; Shin. D.J.; Kim. S.T.*; Choi. W.*; "Metal-free, Flexible Triboelectric Generator based on MWCNT Mesh Film and PDMS Layers", ***Applied Surface Science*, 2018**, 442, 693-699

42. Han. D.H.; Farion. C.; Yang. C.; Scott. T.; Browe. D.; **Choi. W.**; Freeman. J.W.; Lee. H.W.*; "Soft Robotic Manipulation and Locomotion with a 3D Printed Electroactive Hydrogel", ***ACS Applied Materials & Interfaces*, 2018,** 10 (21), 17512-17518

43. Seo. B.S.; Hwang. H.Y.; Kang. S.G.; Cha. Y.S.; **Choi. W.***; "Flexible-detachable dual-output sensors of fluid temperature and dynamics based on structural design of thermoelectric materials", ***Nano Energy*, 2018,** 50, 733-743

44. Seo. B.S.; Hwang. H.Y.; Park. S.H.; **Choi. W.***; "A Simple Fabrication Route of Porous Palladium/Palladium Oxide/Carbon Nanostructures using One-Step Combustion Waves for High-Performance pH Sensors", ***Sensors and Actuators B: Chemical*, 2018,** 274, 37-46

45. Lee. S.H.; Bae. Y.G.; Yoon. K.J.; Lee. J.H.; **Choi. W.**; Hong. J.S.*; "Key characteristics of a hydrocarbon-fueled solid oxide fuel cell examined by local thermodynamic states", ***Energy Conversion and Management*, 2018,** 174, 565-578

46. Lee. S.H.‡; Lee. J.M.‡; Hwang. H.Y.; Yeo. T.H.; Lee. H.W.; **Choi. W.***; "Layer-by-Layer assembled carbon nanotube-polyethyleneimine coatings inside copper-sintered heat pipes for enhanced thermal performance", ***Carbon*, 2018,** 140, 521-532

47. Hwang. H.Y.; Shin. D.J.; Kim. T.W.; Park. S.H.; Yeo. T.H.; **Choi. W.***; "Tunable fabrication of core-shell Ni-MnO2 hybrid foams through structure-guided combustion waves for

binder-free high-performance supercapacitor electrodes", ***Journal of Materials Chemistry A*****, 2018,** 6, 22998-23009

48. Park. T.Y.‡; Lee. S.J.‡; Cha. J.H.; **Choi. W.***; "Scalable Fabrication of Nanopores in Membranes via Thermal Annealing of Au Nanoparticles", ***Nanoscale*****, 2018,** 10, 22623-22634

49. Kang. S.G.‡; Cha. J.H.‡; Seo. K.B.; Kim. S.J.; Cha. Y.S.; Lee. H.W.; Park. S.J.; **Choi. W.***; "Temperature-responsive thermal metamaterials enabled by modular design of thermally tunable unit cells", ***International Journal of Heat and Mass Transfer*****, 2019,** 130, 469-482

50. Lee. S.J.; Cha. J.H.; Kim. K.M.; **Choi. W.***; "Dynamics of drop impact on heated metal wires: Thermally induced transition from tail to splash to jumping modes", ***International Journal of Heat and Mass Transfer*****, 2019,** 131, 226-236

51. Jeon. D.C.; Kim. S.H.*; **Choi. W.***; Byon. C.*; "An experimental study on the thermal performance of cellulose-graphene-based thermal interface materials", ***International Journal of Heat and Mass Transfer*****, 2019,** 132, 944-951

52. Lee. D.; Jang. H.; Lee. B.J.; **Choi. W.***; Byon. C.*; " Internal natural convection around a sphere in a rectangular chamber", ***International Journal of Heat and Mass Transfer*****, 2019,** 136, 501-509

53. Yeo. T.H.; Lee. J.H.; Shin. D.J.; Park. S.H.; Hwang. H.Y.; **Choi. W.***; "One-step fabrication of silver nanosphere-wetted carbon nanotube electrodes via electric-field-driven combustion wave for high-performance flexible supercapacitors", ***Journal of Materials Chemistry A,*** **2019,** 7, 9004-9018

54. Yang. C.; Boorugu. M.; Dopp. A.; Ren. J.; Martin. R.; **Choi. W.**; Lee. H.W.*; "4D Printing Reconfigurable, Deployable and Mechanically Tunable Metamaterials", ***Materials Horizons,*** **2019,** 6, 1244-1250

55. Shin. D.J.; Hwang. H.Y.; Yeo. T.H.; Park. S.H.; Kim. T.W.; Lee. J.H.; **Choi. W.***; "Sol-gel-driven combustion wave for scalable transformation of Mn(NO3)2 precursors into MnO2-X/MWCNT supercapacitor electrodes capable of electrochemical activation", ***Carbon,*** **2019,** 6, 1244-1250

56. Park. J.H.;Lee W.S.; Kim. I.S.; Kim. M.W.; Jo. S.J.; Kim W.; Park. H.J.; Lee. G.D.; **Choi. W.**; Yoon D.S.; Park. J.S.*; "Ultrasensitive Detection of Fibrinogen using Erythrocyte Membrane-Draped Electrochemical Impedance Biosensor", ***Sensors and Actuators B: Chemical*****, 2019**, 293, 296-303

57. Seo. B.S.; Cha. Y.S.; Kim. S.T.*; **Choi. W.***; "Rational Design for Optimizing Hybrid Thermo-Triboelectric Generators Targeting Human Activities", ***ACS Energy Letters*****, 2019**, 4, 2069-2074

58. Park. S.H.; Shin. D.J.; Yeo. T.H.; Seo. B.S.; Hwang. H.Y.; Lee. J.H.; **Choi. W.***; "Combustion-driven synthesis route for tunable TiO2/RuO2 hybrid composites as high-performance electrode materials for supercapacitors", ***Chemical Engineering Journal,*** **2020,** 384, 123269

59. Lee. S.J.; Kang. J.Y.; **Choi. W.***; Kwak. R.K.*; "Simultaneous electric production and sizing of emulsion droplets in microfluidics", ***Soft Matter,*** **2020,** 16, 614

60. Ryu. H.S.; Kim. D.Y.; Lee. S.J.; **Choi. W.**; Kwon. S.J.; Han. J.H.; Cho. E.S.; "Understanding of the mechanism for laser ablation-assisted patterning of graphene/ITO double layers: Role of effective thermal energy transfer", ***Micromachines,*** **2020,** 11, 821

61. Seo. B.S.; Cha. Y.S.; Kim. S.T.*; **Choi. W.***; "Tunable Current Duration in Triboelectric Generators via Capacitive Air-gaps", ***International Journal of Energy Research,*** **2021,** 45, 5619

62. Choi. Y.G.; Kim. H.S.; Lee. H.M.; **Choi. W.**; Kwon. S.J.; Han. J.H.; Cho. E.S.; "Effect of Ag mid-layers on laser direct ablation of transparent conductive ITO/Ag/ITO multilayers: role of effective absorption and focusing of photothermal energy", ***Materials,*** **2021,** 14, 5136

63. Lee. S.J.‡; Lee. H.M.‡; Lim. D.H.; Song C.H.; **Choi. W.***; "Temperature-responsive ultrasonic-wave engineering using thermoresponsive polymers", ***Advanced Functional Materials,*** **2021,** 31, 2104042

64. Yeo. T.H.; Seo. B.S.; Lee J.H.; Park. S.H.; Kim K.M; **Choi. W.***; "Ultrafast Extreme Thermal–Electrical Fabrication of Volcano-Shape-like Core-Shell Ag-MnxOy Branches anchored on Carbon as High-Performance Electrochemical Electrodes", ***Nano Energy,*** **2022,** 91, 106663

65. Lee. J.M.; Kyeong. D.H.; Kim J.H.; **Choi. W.***; "Layer-by-Layer self-assembled functional coatings of carbon nanotube-polyethylenimine for enhanced heat transfer of heat sinks", ***International Journal of Heat and Mass Transfer,*** **2022,** 184, 122344

66. Park. S.H.; Seo. B.S.; Shin. D.J.; Kim. K.M.; **Choi. W.***; "Sodium-chloride-assisted synthesis of nitrogen-doped cube-like hierarchically porous carbon shells via one-step combustion waves for high-performance supercapacitors", ***Chemical Engineering Journal,*** **2022,** 433, 134486

67. Seo. B.S.‡; Kim. W.S.‡; Park. S.H.; Song. C.H.; **Choi. W.***; "Electrothermally tunable morphological and redox design of heterogeneous Pd/PdxOy/carbon for humidity-hydron-driven energy harvester", ***Nano Energy,*** **2022,** 95, 107053

68. Lim. D.H.; Lee. J.M.; Park J.W.; **Choi. W.***; "High-resolution and electrically conductive three-dimensional printing of carbon nanotube-based polymer composites enabled by solution intercalation", ***Carbon,*** **2022,** 194, 1

69. Cha. Y.S.‡; Seo. B.S.‡; Chung. M.K.‡; Kim. B.S.Y.; **Choi. W.***; Park. W.S.*; "Skin-inspired thermometer enabling contact-independent temperature sensation via Seebeck-resistive bimodal system", ***ACS Applied Materials & Interfaces,*** **2022,** 14, 17920

70. Seo. B.S.; Shin. I.C.; Cha. Y.S.; Kim. K.M.; **Choi. W.***; "Ultrahigh thermopower waves in carbon nanotube-antimony telluride composites enabled by thermal decomposition of formaldehyde", ***International Journal of Energy Research,*** **2022,** *DOI: 10.1002/ER.7839*

71. Lim. D.H.‡; Park. J.W.‡; Lee. J.M.; Noh. D.W.; Lee. J.W.; Choi. J.H.; **Choi. W.***; "Broadband mechanical metamaterial absorber enabled by fused filament fabrication 3D printing", ***Additive Manufacturing,*** **2022,** 55, 102856

72. Kim. J.H.; Lee. J.M.; Song. C.H.; Yun. J.Y.; **Choi. W.***; "Enhanced thermal performances of PCM heat sinks enabled by layer-by-layer-assembled carbon nanotube–polyethylenimine functional interfaces", ***Energy Conversion and Management,*** **2022,**

266, 115853

73. Kim. K.M.‡; Seo. B.S.‡; Park. S.H.; Shin. D.J.; Kim. S.S.; **Choi. W.***; "Electrothermally driven nucleation energy control of defective carbon and nickel-cobalt oxide-based electrodes", ***ACS Nano,* 2022,** 16, 9772

74. Cha. Y.S.‡; Kim. T.W.‡; Seo. B.S.; **Choi. W.***; "Combustion-driven synthesis route for bimetallic Ag-Bi nanoparticle-anchored carbon nanotube electrodes for high-performance supercapacitors", ***Carbon,* 2022,** 198, 11

75. Kim. W.S.; Shin. D.J.; Seo. B.S.; Chae. S.H.; Jo. E.M.; **Choi. W.***; "Precisely tunable synthesis of binder-free cobalt oxide-based Li-ion battery anode using scalable electrothermal waves", ***ACS Nano,* 2022,** 16, 17313

76. Koo. J.; Jeong. H.; **Choi. W.**; Shim. J.H.*; "Localized Growth of Atomic-Layer-Deposited Platinum Catalysts on Plasma-Treated Surface of Carbon Nanotubes", ***Scripta Materialia,* 2023,** 226, 115185

77. Seo. B.S.; Han. H.S.; Kim. K.M.; Noh. D.W.; Shim. J.H.; **Choi. W.***; "Humidity-thermoelectric bimodal energy harvester for sustainable power generation", ***Nano Energy,* 2023,** 107, 108120

78. Chang. W.H.; Kang. E.H.; Jeong. H.J.; **Choi. W.**; Shim. J.H.*; "Inkjet printing of perovskite ceramics for high-performance proton ceramic fuel cells", ***Energy,* 2023,** 268, 126489

79. Seo. B.S.; Cha. Y.S.; Choi. Y.; Kim. S.T.*; **Choi. W.***; "Rationally designed micropixelation-free tactile sensors via contour profile of triboelectric field propagation", ***Nano Energy,* 2023,** 109, 108255

80. Lee. J.M.‡; Kim. J.H.‡; Seo. B.S.; Shin. D.J.; Hwang. S.H.; **Choi. W.***; "Layer-by-layer solution-processed two-dimensional graphene oxide–polyethylenimine thin-film coatings for enhanced pool boiling heat transfer", ***International Journal of Heat and Mass Transfer,* 2023,** 209, 124067

81. Lee. S.J.; Kim. K.M.; **Choi. W.***; "Rational understanding of viscoelastic drop impact dynamics on porous surfaces considering rheological properties", ***Applied Physics Letters,* 2023,** 122, 261601

82. Park. S.H.; Seo. B.S.; Shin. D.J.; Chae. S.H.; Cho. H.J.; Kim. S.T.*; **Choi. W.***; "Synthesis of carbon nanotube-iron oxide composites via combustion waves for hybrid Li-ion battery anodes", ***Chemical Engineering Journal,* 2023,** 470, 144260

83. Kyung. D.H.‡; Lee. H.M.‡; Lee. J.M.; Kim. J.H.; Lee. J.W.; Noh. D.W.; **Choi. W.***; "Enhanced temperature-responsive functions of thermal metamaterials by interface engineering", ***International Journal of Heat and Mass Transfer,* 2023,** 215, 124509

84. Song. C.H.‡; Lee. J.M.‡; Seo. B.S.; Shim. J.H.; Hu. R.*; **Choi. W.***; "Enhanced cooling performance of three-dimensional printed heat sink via solution-processed layer-by-layer coatings", ***Advanced Engineering Materials,* 2023,** 25, 2300669

85. Shin. D.J.‡; Chae. S.H.‡; Park. S.H.; Seo. B.S.; **Choi. W.***; "Rational engineering of high-entropy oxides for Li-ion battery anodes with finely tuned combustion syntheses", ***NPG Asia Materials,* 2023,** 15, 54

86. Song. C.H.‡; Lee. J.M.‡; Lim. D.H.; Shim. J.H.; **Choi. W.***; "Rationally tunable PCM thermal properties enabled by three-dimensionally printed structural materials and carbon-based functional additives", ***International Journal of Energy Research,*** **2023**, 6658082

87. Kim. S.B.‡; Shin. J.C.‡; Kim. H.S.; Park. J.C.; Baik. J.M.; Kim. S.Y.; Kang. C.Y.; **Choi. W.***; Song. H.C.*; Hur. S.H.*; "A Synergetic Effect of Piezoelectric Energy Harvester to Enhance Thermoelectric Power: An Effective Hybrid Energy Harvesting Method", ***Energy Conversion and Management,*** **2023,** 298, 117774

88. Lee. J.W.‡; Lim. D.H.‡; Park. J.W.; Lee. J.M.; Noh. D.W.; Grace. X.Gu.*; **Choi. W.***; "Multifunctionality of additively manufactured Kelvin foam for electromagnetic wave absorption and load bearing", ***Small,*** **2023,** 19, 2305005

89. Lee. H.M.‡; Noh. D.W.‡; Lee. S.J.; Lee. J.W.; **Choi. W.***; "Thermally driven hybrid metastructure for multi-functional surface acoustic wave engineering", ***International Journal of Mechanical Sciences,*** **2024,** 262, 108722

90. Zhu. Z.; Wang. Z.; Liu. T.; Xie. B.; Luo. X.; **Choi. W.***; Hu. R.*; "Arbitrary-shape transformation multiphysics cloak by topology optimization", ***International Journal of Heat and Mass Transfer,*** **2024,** 222, 125205

91. Cha. Y.S.‡; Kim. T.W.‡; Kim. K.M.; Seo. J.W.; Jang. H.Y.; **Choi. W.***; "Scalable exothermic synthesis of sprout-like Ni-Co-Fe trimetallic oxide nanoparticles anchored on N-doped carbon nanotubes as bifunctional oxygen catalysts for zinc-air batteries", ***Carbon,*** **2024,** 220, 118859

92. Yun. J.Y.; Lee. J.M.; Kim. J.H.; Lee. J.W.; **Choi. W.***; "Hexagonal boron nitride nanosheets/graphene nanoplatelets/cellulose nanofibers-based multifunctional thermal interface materials enabling electromagnetic interference shielding and electrical insulation", *(submitted)*

93. Cha. Y.S.; Kim. T.W.; Jang. H.Y.; Noh. D.W.; **Choi. W.***; "Synthesis of trimetallic oxide/nitrogen-doped carbon composite via ZIF-guided combustion pyrolysis for efficient bifunctional oxygen catalysis in zinc–air batteries", *(submitted)*

94. Yeo. T.H.; Kim. K.M.‡; Lee. J.H.; Seo. B.S.; Park. S.H.; **Choi. W.***; "Studies toward morphological changes of silver/carbon fiber composites and their optimization for high-performance electrochemical electrodes", *(submitted)*

95. Lim. D.H.; Lee. S.R.; Lee. J.H.; **Choi. W.***; Grace. X.Gu.*; "Mechanical metamaterials as multifunctional broadband electromagnetic wave absorbers", *(submitted)*

96. Shin. D.J.; Ryu. K.H.; Kim. D.H.; Choi. E.H.; Chae. S.H.; Lee. Y.D.; Kang. Y.T.; Kim. S.T.*; **Choi. W.***; "Boosted Thermogalvanic Thermopower upon Solid-to-Liquid Phase Transition", *(submitted)*

97. Cho. Y.H.; Kim. T.W.; Kim. K.M.; **Choi. W.***; "Combustion-Assisted Sintering for Tunable Densification of Manganese Cobalt Oxide Layers ", *(submitted)*

98. Kim. S.G.; Kim. M.J.; Jang. K.J.; Yoon. S.G.; **Choi. W.**; Lee. H.S.; Shim. J.H.; Kagn. Y.T.*; "Sustainable indoor CO2 capture-driven passive cooling for building-integrated photovoltaics with ventilation energy reduction", *(submitted)*

99. Lim. D.H.‡; Lee. J.W.‡; Park. J.W.; Lee. J.M.; Noh. D.W.; Park. S.J.; Grace. X. Gu.*; **Choi. W.***; "Multifunctional seamless meta-sandwich composite as lightweight, load-bearing, and broadband-electromagnetic-wave-absorbing structure", *(submitted)*

100. Lee. J.H.‡; Han. H.S.‡; Noh. D.W.‡, Lee. J.W. Lim. D.H.; Park. J.W.; Grace. X. Gu.; **Choi. W.***; "Multiscale porous architecture consisting of graphene aerogels and metastructures enabling robust thermal and mechanical functionalities of phase change materials", *(submitted)*