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Professor

B.S. in Chemical Engineering  
National Taiwan University, 1996  
M.S. in Chemical Engineering  
National Taiwan University, 1998  
Ph.D. in Chemical Engineering  
University of California at Berkeley, 2006

**Research and Professional Interests**

Plasma processing techniques  
Fabrication and characterization of  
nano-scale and thin film materials  
Numerical simulation of plasma  
processes

**Journal Papers**

1. C. H. Yang, F. H. Kuok, C. Y. Liao, T. H. Wan, C. W. Chen, **C. C. Hsu**, I. C. Cheng and J. Z. Chen, "Flexible reduced graphene oxide supercapacitor fabricated using a nitrogen dc- pulse atmospheric-pressure plasma jet", *Materials Research Express*, 4(2), 2017(Feb), (SCI)
2. F. H. Kuok, K. Y. Kan, I. S. Yu, C. W. Chen, **C. C. Hsu**, I. C. Cheng and J. Z. Chen, "Application of atmospheric-pressure plasma jet processed carbon nanotubes to liquid and quasi-solid-state gel electrolyte supercapacitors", *Applied Surface Science*, 425, 321-328, 2017(Dec), (SCI)
3. C. Y. Liao, F. H. Kuok, C. W. Chen, **C. C. Hsu** and J. Z. Chen, "Flexible quasi-solid-state SnO<sub>2</sub>/CNT supercapacitor processed by a dc-pulse nitrogen atmospheric-pressure plasma jet", *Journal of Energy Storage*, 11, 237-241, 2017(Jun), (SCI)
4. T. H. Wan, C. C. Lee, C. W. Chen, **C. C. Hsu**, I. C. Cheng and J. Z. Chen, "A Comparison Study of Furnace and Atmospheric-Pressure-Plasma Jet Calcined Pt-Decorated Reduced Graphene Oxides for Dye-Sensitized Solar Cell Application", *Journal of the Electrochemical Society*, 164(13), H931-H935, 2017, (SCI)
5. C. H. Yang, C. W. Chen, Y. K. Lin, Y. C. Yeh, **C. C. Hsu**, Y. J. Fan, I. S. Yu and J. Z. Chen, "Atmospheric-Pressure Plasma Jet Processed Carbon-Based Electrochemical Sensor Integrated with a 3D-Printed Microfluidic Channel", *Journal of the Electrochemical Society*, 164(12), B534-B541, 2017, (SCI)
6. J. H. Tsai, I. C. Cheng, **C. C. Hsu** and J. Z. Chen, "DC-pulse atmospheric-pressure plasma jet and dielectric barrier discharge surface treatments on fluorine-doped tin oxide for perovskite solar cell application", *Journal of Physics D-Applied Physics*, 51(2), 2018(Jan), (SCI)
7. H. H. Chien, C. Y. Liao, Y. C. Hao, **C. C. Hsu**, I. C. Cheng, I. S. Yu and J. Z. Chen, "Improved performance of polyaniline/reduced-graphene-oxide supercapacitor using atmospheric-pressure-plasma-jet surface treatment of carbon cloth", *Electrochimica Acta*, 260, 391-399, 2018(Jan), (SCI)
8. C. C. Lee, T. H. Wan, **C. C. Hsu**, I. C. Cheng and J. Z. Chen, "Atmospheric-pressure plasma jet processed Pt/ZnO composites and its application as counter-electrodes for dye-sensitized solar cells", *Applied Surface Science*, 436, 690-696, 2018(Apr), (SCI)
9. K. Y. Huang, H. Y. Chi, P. K. Kao, F. H. Huang, Q. M. Jian, I. C. Cheng, W. Y. Lee, **C. C.**

- Hsu** and D. Y. Kang, "Atmospheric Pressure Plasma Jet-Assisted Synthesis of Zeolite-Based Low-k Thin Films", *Acs Applied Materials & Interfaces*, 10(1), 900-908, 2018(Jan), (SCI)
10. C. Y. Wang and **C. C. Hsu**, "How critical is geometrical confinement? Analysis of spatially and temporally resolved particulate matter removal with an electrostatic precipitator", *Rsc Advances*, 8(54), 30925-30931, 2018, (SCI)
  11. J. H. Tsai, I. C. Cheng, **C. C. Hsu**, C. C. Chueh and J. Z. Chen, "Feasibility study of atmospheric-pressure dielectric barrier discharge treatment on CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> films for inverted planar perovskite solar cells", *Electrochimica Acta*, 293, 1-7, 2019(Jan), (SCI)
  12. C. Y. Wang and **C. C. Hsu**, "Online, Continuous, and Interference-Free Monitoring of Trace Heavy Metals in Water Using Plasma Spectroscopy Driven by Actively Modulated Pulsed Power", *Environmental Science & Technology*, 53(18), 10888-10896, 2019(Sep), (SCI)
  13. C. Y. Wang and **C. C. Hsu**, "Characterization of plasma in aqueous solution using bipolar pulsed power: Tailoring plasma and optical emission with implication for detecting lead", *Plasma Processes and Polymers*, 2019(Nov), (SCI)
  14. J. H. Tsai, S. M. Hsu, I. C. Cheng, **C. C. Hsu** and J. Z. Chen, "Conversion of dense and continuous nickel oxide compound thin films using nitrogen DC-pulse atmospheric-pressure plasma jet", *Ceramics International*, 45(17), 22078-22084, 2019(Dec), (SCI)
  15. T. E. Li, J. H. Tsai, I. C. Cheng, **C. C. Hsu** and J. Z. Chen, "Atmospheric-pressure surface-diffusion dielectric-barrier discharge (SDDBD) plasma surface modification of PEDOT:PSS", *Synthetic Metals*, 256, 2019(Oct), (SCI)
  16. F. H. Huang, S. Y. Lin and **C. C. Hsu**, "A low-cost microplasma generation unit allowing for the on-site processing of ZnO-based gas sensors", *Analyst*, 144(22), 6653-6659, 2019(Nov), (SCI)
  17. Z. C. Chen, Y. Cheng, C. C. Lin, C. S. Li, **C. C. Hsu**, J. Z. Chen, C. I. Wu and I. C. Cheng, "In-situ atmospheric-pressure dielectric barrier discharge plasma treated CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> for perovskite solar cells in regular architecture", *Applied Surface Science*, 473, 468-475, 2019(Apr), (SCI)
  18. C. Y. Wang and **C. C. Hsu**, "Development and testing of an efficient data acquisition platform for machine learning of optical emission spectroscopy of plasmas in aqueous solution", *Plasma Sources Science and Technology*, 28(10), 105013, 2019(Oct), (SCI)
  19. C.F. Fan, Y.C. Chien, **C.C. Hsu**, I.C. Cheng, L.H. Chien, J.Z. Chen, "Flexible reduced graphene oxide supercapacitors processed using atmospheric-pressure plasma jet under various temperatures adjusted by flow rate and jet-substrate distance", *Materials Research Express*, 7(1), 2020(Jan), (SCI)
  20. J.H. Tsai, I.C. Cheng, **C.C. Hsu**, J.Z. Chen, "Low-Temperature (< 40 degrees C) Atmospheric-Pressure Dielectric-Barrier-Discharge-Jet Treatment on Nickel Oxide for p-i-n Structure Perovskite Solar Cells", *Acs Omega*, 5(11), 6082-6089, 2020(Mar), (SCI)
  21. T.M. Huang, I.C. Cheng, **C.C. Hsu**, J.Z. Chen, "Concentration effect on properties of Pt-NiOx nanocompounds converted from mixed chloroplatinic acid and nickel acetate

precursor films using an atmospheric-pressure plasma jet", *Journal Of Applied Physics*, 128(4), 2020(Jul), (SCI)

22. I.H. Chen, M.W. You, J.H. Tsai, J.H. Chang, I.C. Cheng, **C.C. Hsu**, S.C. Luo, C.F. Chen, J.Z. Chen, "Feasibility Study of Dielectric Barrier Discharge Jet-Patterned Perfluorodecyltrichlorosilane-Coated Paper for Biochemical Diagnosis", *Ecs Journal Of Solid State Science And Technology*, 10(3), 2021(Mar), (SCI)
23. C. Y. Wang, T.S. Ko, **C.C. Hsu**, "Interpreting convolutional neural network for real-time volatile organic compounds detection and classification using optical emission spectroscopy of plasma", *Analytica Chimica Acta*, 1179, 2021(Sep), (SCI)
24. C. Y. Wang, T.S. Ko, **C.C. Hsu**, "Machine Learning with Explainable Artificial Intelligence Vision for Characterization of Solution Conductivity Using Optical Emission Spectroscopy of Plasma in Aqueous Solution", *Plasma Processes And Polymers*, 18(12), 2021(Dec), (SCI)
25. Lai, Jheng-Yun; **Hsu, Cheng-Che**; Chen, Jian-Zhang, Comparison between atmospheric-pressure-plasma-jet-processed and furnace-calcined rGO-MnOx nanocomposite electrodes for gel-electrolyte supercapacitors, *Journal Of Alloys And Compounds*, 911, 2022(Feb). (SCI)
26. Lin, Kuan-Yu; Liang, **Cheng-Sheng**; **Hsu**, Cheng-Che; Lin, Shuei-Liong; Chen, Yi-Ting; Huang, Fong-Shung; Wang, Shang-Lin; Jang, Jyh-Shing; Lu, Yen-Wen, Optoelectronic online monitoring system for hemodialysis and its data analysis, *Sensors And Actuators B-Chemical*, 364, 2022(Sep). (SCI)
27. Mallela, Mohana Sruthi; Tsai, Jui-Hsuan; Huang, Jian-Zhi; **Hsu, Cheng-Che**; Chen, Mei-Hsin; Wu, Chih-, I; Chen, Jian-Zhang; Cheng, I-Chun, Dielectric barrier discharge jet processed TiO2 nanoparticle layer for flexible perovskite solar cells, *Journal Of Physics D-Applied Physics*, 55(3), 2022(Dec) (SCI)
28. Shih, Chung-Yueh; Ni, I-Chih; Chan, Chih-Lin; **Hsu, Cheng-Che**; Wu, Chih-, I; Cheng, I-Chun; Chen, Jian-Zhang, Helium Dielectric Barrier Discharge Plasma Jet (DBD Jet)-Processed Graphite Foil as Current Collector for Paper-Based Fluidic Aluminum-Air Batteries, *Energies*, 15(16), 2022(Mar) (SCI)

### Conference Papers

1. T.K Yuan and **C. C. Hsu**, "The Development of a Portable High Voltage Module for Microplasma Generation Devices", APSPT10, Taoyuan Taiwan, 2017(Dec), (**Poster**)
2. Q.M. Jian, P.W. Yeh and **C. C. Hsu**, "The Development of a Cellphone-Based Spectrometer for Acquisition of Plasma Optical Emission Spectroscopy", APSPT10, Taoyuan Taiwan, 2017(Dec), (**Poster**)
3. F.Y. Yang and **C. C. Hsu**, "The Design and Development of a Portable Microplasma Generation Device for Detection of Metallic Ions in Aqueous Solutions", APSPT10, Taoyuan Taiwan, 2017(Dec), (**Poster**)
4. S.Y. Lin, F.H. Huang and **C. C. Hsu**, "Development of a Low-Cost Zinc Oxide-Based Gas Sensor with an Integrated Microplasmas Generation Unit", APSPT10, Taoyuan Taiwan, 2017(Dec), (**Poster**)

5. **C. C. Hsu**, "Moving from Atmospheric Pressure Plasma Jets to Portable Plasma Generation Devices – Novelty and Challenges", 2017 APSPT10, Taoyuan Taiwan, 2017(Dec), (**Tutorial Lecture**)
6. **C. C. Hsu**, "The Development of a Portable Device for Detection of Heavy Metal Ions in Water using a Microplasma Generation Device Integrated with a Cellphone-based Spectrometer", 2017 APSPT10, Taoyuan Taiwan, 2017(Dec), (**Program Chair**)
7. C.Y. Wang and **C. C. Hsu**, "Development of Needle Type Electrostatic Precipitator for Airborne Particulate Matter Removal", APSPT10, Taoyuan Taiwan, 2017(Dec)
8. **C. C. Hsu**, "Recent Progress on Atmospheric Pressure Plasma Development: From Ultra-Rapid Processing to Portable Plasma Generation Devices – A New Route?", Army Research Labs, Baltimore MD USA, 2017(Dec), (**Invited Talk**)
9. T.K Yuan and **C. C. Hsu**, "The Development of a Portable High Voltage Module for Microplasma Generation Devices", 2017 MRS, Boston MA USA, 2017(Nov), (**Poster**)
10. Q.M. Jian, P.W. Yeh and **C. C. Hsu**, "The Development of a Cellphone-Based Spectrometer for Acquisition of Plasma Optical Emission Spectroscopy", 2017 MRS, Boston MA USA, 2017(Nov), (**Poster**)
11. F.Y. Yang and **C. C. Hsu**, "The Design and Development of a Portable Microplasma Generation Device for Detection of Metallic Ions in Aqueous Solutions", 2017 MRS, Boston MA USA, 2017(Nov), (**Poster**)
12. **C. C. Hsu**, "The Development of a Portable Device for Detection of Heavy Metal Ions in Water using a Microplasma Generation Device Integrated with a Cellphone-based Spectrometer", 2017 MRS, Boston MA USA, 2017(Nov), (**Symposium Co-organizer**)
13. C.Y. Wang and **C. C. Hsu**, "Development of Needle Type Electrostatic Precipitator for Airborne Particulate Matter Removal", 2017 MRS, Boston MA USA, 2017(Nov), (**Poster**)
14. C.Y. Wang and **C. C. Hsu**, "Detection of Metallic Ions in Solution Using Optical Emission Spectroscopy of Plasma Driven by Bipolar Pulsed Power Sources", 65th AVS, Long Beach CA USA, 2018(Oct), (**Poster**)
15. S.Y. Lin and **C. C. Hsu**, "Development of A Low-Cost ZnO Nanorods-Based Gas Sensor with an Integrated Microplasma Generation Unit for Ethanol Sensing", 65th AVS, Long Beach CA USA, 2018(Oct), (**Poster**)
16. C.Y. Su and **C. C. Hsu**, "Development of a Light-weight System for Detection of Metal Ions in Solutions Using Plasma Spectroscopy", 65th AVS, Long Beach CA USA, 2018(Oct), (**Poster**)
17. T.T. Pan and **C. C. Hsu**, "Development of a Plasma Generation Device Integrated with a Piezoelectric Spray to Detect Metal Ions in Solution", 65th AVS, Long Beach CA USA, 2018(Oct), (**Poster**)
18. C.Y. Wang and **C. C. Hsu**, "Detection of Metallic Ions in Solution Using Optical Emission Spectroscopy of Plasma Driven by Bipolar Pulsed Power Sources", 2018 AIChE Annual Meeting, Pittsburgh PA USA, 2018(Oct), (**Poster**)

19. C.Y. Wang and **C. C. Hsu**, "Detection of Metallic Ions in Solution Using Optical Emission Spectroscopy of Plasma Driven by Bipolar Pulsed Power Sources", 5th TJPL, Kaohsiung Taiwan, 2018(Dec), (**Poster**)
20. S.Y. Lin and **C. C. Hsu**, "Development of A Low-Cost ZnO Nanorods-Based Gas Sensor with an Integrated Microplasma Generation Unit for Ethanol Sensing", 5th TJPL, Kaohsiung Taiwan, 2018(Dec), (**Poster**)
21. C.Y. Su and **C. C. Hsu**, "Development of a Light-weight System for Detection of Metal Ions in Solutions Using Plasma Spectroscopy", 5th TJPL, Kaohsiung Taiwan, 2018(Dec), (**Poster**)
22. T.T. Pan and **C. C. Hsu**, "Development of a Plasma Generation Device Integrated with a Piezoelectric Spray to Detect Metal Ions in Solution", 5th TJPL, Kaohsiung Taiwan, 2018(Dec), (**Poster**)
23. C.H. Tsai and **C. C. Hsu**, "A Portable Cellphone-based Spectrometer to Discriminate Different Gas Ambient", 5th TJPL, Kaohsiung Taiwan, 2018(Dec), (**Poster**)
24. H.Y. Chen and **C. C. Hsu**, "The Development of a Portable Gas Sensing System Integrating Microplasma Spectroscopy with Cellphone-Based Spectrometer", 5th TJPL, Kaohsiung Taiwan, 2018(Dec), (**Poster**)
25. **C. C. Hsu**, "Development of Novel Plasma Generation Device for Sensing and Analytical Applications", 5th TJPL, Kaohsiung Taiwan, 2018(Dec), (**Invited Talk**)
26. **C. C. Hsu**, "Machine Learning for Optical Emission Spectroscopy of Plasmas Generated in Water Solution", 6th JTPL, Tsuruoka, Japan, 2019(Jul), (**Invited Talk**)
27. H.Y. Chen and **C. C. Hsu**, "A Smartphone-Based Portable Gas Sensing System", 6th JTPL, Tsuruoka, Japan, 2019(Jul), (**Poster**)
28. H.Y. Chen and **C. C. Hsu**, "A Smartphone-Based Portable Gas Sensing System", 2019 APSPT-11, Kanazawa, Japan, 2019(Dec), (**Poster**)
29. C.Y. Su and **C. C. Hsu**, "Development of a Light-weight System for Detection of Metal Ions in Solutions Using Plasma Spectroscopy", 2019 APSPT-11, Kanazawa, Japan, 2019(Dec), (**Poster**)
30. C.H. Tsai and **C. C. Hsu**, "Application of Machine Learning for Real-Time Detection of Volatile Organic Compounds Using Plasma Emission Spectroscopy", 2019 APSPT-11, Kanazawa, Japan, 2019(Dec), (**Poster**)
31. T.T. Pan and **C. C. Hsu**, "Development of a Plasma Generation Device Integrated with the Homemade Raspberry Pi Spectrometer to Detect Metal Ions in Solution", 2019 APSPT-11, Kanazawa, Japan, 2019(Dec), (**Poster**)
32. **C. C. Hsu**, "Machine Learning for Volatile Organic Compounds Identification Using Plasma Spectroscopy: Classification, Feature Extraction, and Transfer Learning" (Plenary Speaker), 12<sup>th</sup> APSPT, Taiwan, Dec. 2021.
33. M. H. Tai and **C.C. Hsu**, "Monitoring Water Solution pH Changes in Real-time with Plasma Spectroscopy and Machine Learning", (Poster), 12<sup>th</sup> APSPT, Taiwan, Dec. 2021.

34. Y. H. Chu and C.C. Hsu, "Discharge Characteristics and Application for Discriminating Ethanol in Ambient Air with Microplasma Optical Emission Spectroscopy", (Poster), 12<sup>th</sup> APSPT, Taiwan, Dec. 2021.
35. C. Y. Wang and C.C. Hsu, "Develop Microplasma Generation Device Using Optical Emission Spectroscopy to Detect Volatile Organic Compounds in Air", (Poster), 12<sup>th</sup> APSPT, Taiwan, Dec. 2021.
36. C. H. Hsu and C.C. Hsu, "Development of a home-made and low-cost probe for heavy metal detection using plasma electrolysis", (Poster), 12<sup>th</sup> APSPT, Taiwan, Dec. 2021.
37. F. E. Hsing and C.C. Hsu, "Detection of Metallic Ions in Solution Using Optical Emission Spectrometry of Microplasmas", (Poster), 12<sup>th</sup> APSPT, Taiwan, Dec. 2021.
38. X. L. Zhang and C.C. Hsu, "Classification of Volatile Organic Compounds Using Plasma Spectroscopy with Machine Learning", (Poster), 12<sup>th</sup> APSPT, Taiwan, Dec. 2021.
39. J. W. Syu and C.C. Hsu, "Classification of Multiple Volatile Organic Compounds by Microplasma Emission Spectroscopy with Machine Learning", (Poster), 12<sup>th</sup> APSPT, Taiwan, Dec. 2021.
40. C. C. Hsu, "Machine Learning on Plasma Spectroscopy for Analytical Applications", (Invited Lecture), 15th ISPlasma/16th IC-PLANT, Japan, Mar. 2023.
41. H. A. Yu, Y. H. Chu and C. C. Hsu, "Development of a Portable Plasma Generation Device Driven by a Bluetooth-Modulated Power Source for VOC Detection", (Poster), 15th ISPlasma/16th IC-PLANT, Japan, Mar. 2023.
42. K. T. Chen, P. C. Chang, W. C. Yen and C. C. Hsu, "Using Microplasma Spectroscopy for Volatile Organic Compounds Detection in Air", (Poster), 15th ISPlasma/16th IC-PLANT, Japan, Mar. 2023.
43. X. L. Zhang, T. S. Ko and C. C. Hsu, "Machine Learning with Plasma Spectroscopy for Volatile Organic Compounds Classification with Limited Optical Emission Spectroscopic Data", (Poster), 15th ISPlasma/16th IC-PLANT, Japan, Mar. 2023.
44. M. H. Tai and C. C. Hsu, "Real-Time Diagnostics with Plasma Spectroscopy Using Machine Learning", (Poster), 15th ISPlasma/16th IC-PLANT, Japan, Mar. 2023.
45. C. Y. Wang, T. M. Chang and C. C. Hsu, "Development of a Platform for Rapid Optimization of Heavy Metal Detection Using Plasmas in Solution with Optical Emission Spectrometry", (Poster), 15th ISPlasma/16th IC-PLANT, Japan, Mar. 2023.
46. T. M. Chang, C. Y. Wang, J. T. Chen and C. C. Hsu, "Development of a Long-Term, Real-Time, and Remote Heavy Metal Monitoring System in Solution by Plasmas Modulated Using Raspberry Pi", (Poster), 15th ISPlasma/16th IC-PLANT, Japan, Mar. 2023.
47. Y. H. Liu and C. C. Hsu, "Creating Slippery and Sticky Hydrophobic Surfaces Using C4F8 Capacitively Coupled Plasmas", (Poster), 15th ISPlasma/16th IC-PLANT, Japan, Mar. 2023.

### Honors and Others

1. 臺灣大學 103 學年度教學傑出獎 2015

2. 研究團隊獲第十五屆「光寶創新獎」銀賞 2015
3. Cheng-che Hsu, Guest Editor, IEEE Transactions on Plasma Science, Special Issue for APSPT10, 2019.
4. 潘婷婷/指導教授徐振哲教授, Excellent Poster Award, 2018, 5th Taiwan-Japan Plasma Life Science and Technology, Kaohsiung, Taiwan, Dec, 2018.
5. 王靖宇/指導教授徐振哲教授, Excellent Poster Award, 2018, 5th Taiwan-Japan Plasma Life Science and Technology, Kaohsiung, Taiwan, Dec, 2018.
6. 蘇勁宇/指導教授徐振哲教授, Best Poster Award, 2018, 5th Taiwan-Japan Plasma Life Science and Technology, Kaohsiung, Taiwan, Dec, 2018.
7. 林思妘/指導教授徐振哲教授, Best Poster Award, 2018, 5th Taiwan-Japan Plasma Life Science and Technology, Kaohsiung, Taiwan, Dec, 2018.
8. 榮獲臺灣大學工學院 108 學年度「學術勵進獎」(2020)

