

Hsu, Cheng-Che (徐振哲)

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. K. Chang, W. A. Chen, C. Y. Sie, S. C. Lin, L. T. W. Lin, T. H. Lin, **C. C. Hsu** and S. S. Wang, "Investigating the effects of plasma pretreatment on the formation of ordered aggregates of lysozyme", *Colloids and Surfaces B-Biointerfaces*, 126, 154-161, 2015(Feb), (SCI, EI)
2. T. H. Wu, I. C. Cheng, **C. C. Hsu** and J. Z. Chen, "UV photocurrent responses of ZnO and MgZnO/ZnO processed by atmospheric pressure plasma jets", *Journal of Alloys and Compounds*, 628, 68-74, 2015(Apr), (SCI, EI)
3. Y. H. Jiang, I. C. Chiu, P. K. Kao, J. C. He, Y. H. Wu, Y. J. Yang, **C. C. Hsu**, I. C. Cheng and J. Z. Chen, "Influence of rapid-thermal-annealing temperature on properties of rf-sputtered SnOx thin films", *Applied Surface Science*, 327, 358-363, 2015(Feb), (SCI, EI)
4. C. M. Hsu, H. C. Li, S. T. Lien, J. Z. Chen, I. C. Cheng and **C. C. Hsu**, "Deposition of ZnO Thin Films by an Atmospheric Pressure Plasma Jet-Assisted Process: The Selection of Precursors", *Ieee Transactions on Plasma Science*, 43(2), 670-674, 2015(Feb), (SCI, EI)
5. J. Z. Chen, W. Y. Liao, W. Y. Hsieh, **C. C. Hsu** and Y. S. Chen, "All-vanadium redox flow batteries with graphite felt electrodes treated by atmospheric pressure plasma jets", *Journal of Power Sources*, 274, 894-898, 2015(Jan), (SCI, EI)
6. W. Y. Liao, Y. J. Yang, C. M. Hsu, **C. C. Hsu**, I. C. Cheng and J. Z. Chen, "Atmospheric-pressure-plasma-jet sintered dual-scale porous TiO₂ using an economically favorable NaCl solution", *Journal of Power Sources*, 281, 252-257, 2015(May), (SCI, EI)
7. T. J. Wu, C. Y. Chou, C. M. Hsu, **C. C. Hsu**, J. Z. Chen and I. C. Cheng, "Ultrafast synthesis of continuous Au thin films from chloroauric acid solution using an atmospheric pressure plasma jet", *Rsc Advances*, 5(121), 99654-99657, 2015, (SCI, EI)
8. C. Y. Chou, H. M. Chang, H. W. Liu, Y. J. Yang, **C. C. Hsu**, I. C. Cheng and J. Z. Chen, "Atmospheric-pressure-plasma-jet processed nanoporous TiO₂ photoanodes and Pt counter-electrodes for dye-sensitized solar cells", *Rsc Advances*, 5(57), 45662-45667, 2015, (SCI, EI)
9. H. T. Chien, M. C. Chen, P. S. Huang, J. Y. Lai, **C. C. Hsu** and D. Y. Kang, "Reactive atmospheric pressure plasma for highly efficient removal of structure-directing agents from zeolite thin films", *Chemical Communications*, 51(73), 13910-13913, 2015,

(SCI,EI)

10. Y. H. Jiang, P. K. Kao, J. C. He, I. C. Chiu, Y. J. Yang, Y. H. Wu, **C. C. Hsu**, I. C. Cheng and J. Z. Chen, "Optoelectronic properties of infrared rapid-thermal-annealed SnO_x thin films", *Ceramics International*, 41(10), 13502-13508, 2015(Dec), (SCI,EI)
11. G. W. Lin, Y. H. Jiang, P. K. Kao, I. C. Chiu, Y. H. Wu, **C. C. Hsu**, I. C. Cheng and J. Z. Chen, "Nitrogen Atmospheric-Pressure-Plasma-Jet Induced Oxidation of SnO_x Thin Films", *Plasma Chemistry and Plasma Processing*, 35(6), 979-991, 2015(Nov), (SCI,EI)
12. J. Z. Chen, C. Wang, **C. C. Hsu** and I. C. Cheng, "Ultrafast synthesis of carbon-nanotube counter electrodes for dye-sensitized solar cells using an atmospheric-pressure plasma jet", *Carbon*, 98, 34-40, 2016(Mar), (SCI,EI)
13. C. H. Xu, P. Y. Shen, Y. F. Chiu, P. W. Yeh, C. C. Chen, L. C. Chen, **C. C. Hsu**, I. C. Cheng and J. Z. Chen, "Atmospheric pressure plasma jet processed nanoporous Fe₂O₃/CNT composites for supercapacitor application", *Journal of Alloys and Compounds*, 676, 469-473, 2016(Aug), (SCI)
14. T. H. Wan, Y. F. Chiu, C. W. Chen, **C. C. Hsu**, I. C. Cheng and J. Z. Chen, "Atmospheric-Pressure Plasma Jet Processed Pt-Decorated Reduced Graphene Oxides for Counter-Electrodes of Dye-Sensitized Solar Cells", *Coatings*, 6(4), 2016(Dec), (SCI)
15. L. K. Yeh, J. C. Luo, M. C. Chen, C. H. Wu, J. Z. Chen, I. C. Cheng, **C. C. Hsu** and W. C. Tian, "A Photoactivated Gas Detector for Toluene Sensing at Room Temperature Based on New Coral-Like ZnO Nanostructure Arrays", *Sensors*, 16(11), 2016(Nov), (SCI)
16. 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)
17. 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)
18. C. Y. Liao, F. H. Kuok, C. W. Chen, **C. C. Hsu** and J. Z. Chen, "Flexible quasi-solid-state SnO₂/CNT supercapacitor processed by a dc-pulse nitrogen atmospheric-pressure plasma jet", *Journal of Energy Storage*, 11, 237-241, 2017(Jun), (SCI)
19. 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)
20. 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)
21. 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)
22. 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)
 23. 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)
 24. 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)
 25. 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)
 26. 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 CH₃NH₃PbI₃ films for inverted planar perovskite solar cells", *Electrochimica Acta*, 293, 1-7, 2019(Jan), (SCI)
 27. 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)
 28. 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)
 29. 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)
 30. 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)
 31. 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)
 32. 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 CH₃NH₃PbI₃ for perovskite solar cells in regular architecture", *Applied Surface Science*, 473, 468-475, 2019(Apr), (SCI)
 33. 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)

Conference Papers

1. **C. C. Hsu**, "Recent Progress in the Development of Portable Microplasma Generation Devices -- A New Route?", The 75th IUSTA Workshop on Sheath Phenomena in Plasma Processing of Advanced Materials, Slovenia, 2015(Jan), (**Invited Talk**)
2. **C. C. Hsu**, "Development of Portable Plasma Systems – Why and How?", 3rd Taiwan-Japan Workshop on Plasma Life Science and Technology, New Taipei City Taiwan, 2016(Dec), (**Invited Talk**)
3. F.H. Huang and **C. C. Hsu**, "Development of a Sensing Device with an Integrated Plasmas Generation Unit", 2016 AIChE annual meeting, San Francisco CA USA, 2016(Nov), (**Poster**)
4. J.C. Lin and **C. C. Hsu**, "Water Acidification by Atmospheric Pressure Microplasmas Operated in Air", 2016 AIChE annual meeting, San Francisco CA USA, 2016(Nov), (**Poster**)
5. Ching-Yu Wang, Po-Wei Yeh, Chan-Cheng Lin and **Cheng-Che (Jerry) Hsu**, "Development of a Portable and Low Cost Atmospheric Pressure Microplasma Generation Device Driven by MobilePower Pack", 2016 AIChE annual meeting, San Francisco CA USA, 2016(Nov), (**Poster**)
6. C.W. Chen, W. Y. Chung, Y. C. Liao and **C. C. Hsu**, "A Surface Treatment on Polyimide by an Atmospheric Pressure Plasma Jet for Electroless Copper Plating", 30th European Colloid and Interface Society (ECIS) Conference, Rome Italy, 2016(Sep), (**Poster**)
7. Y. Y. Lin, **C. C. Hsu** and P.-W. Yeh, "Development of a Cellphone-Based Optical Emission Spectrometer for Analysis of Plasma Optical Emission", 2016 AIChE annual meeting, San Francisco CA USA, 2016(Nov), (**Poster**)
8. 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**)
9. 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**)
10. 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**)
11. 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**)
12. **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**)
13. **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**)
14. C.Y. Wang and **C. C. Hsu**, "Development of Needle Type Electrostatic Precipitator for

- Airborne Particulate Matter Removal", APSP10, Taoyuan Taiwan, 2017(Dec)
15. **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)**
 16. 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)**
 17. 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)**
 18. 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)**
 19. **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)**
 20. 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)**
 21. 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)**
 22. 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)**
 23. 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)**
 24. 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)**
 25. 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)**
 26. 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)**
 27. 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)**
 28. 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)**

29. 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**)
30. C.H. Tsai and **C. C. Hsu**, "A Portable Cellphone-based Spectrometer to Discriminate Different Gas Ambient", 5th TJPL, Kaohsiung Taiwan, 2018(Dec), (**Poster**)
31. 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**)
32. **C. C. Hsu**, "Development of Novel Plasma Generation Device for Sensing and Analytical Applications", 5th TJPL, Kaohsiung Taiwan, 2018(Dec), (**Invited Talk**)
33. **C. C. Hsu**, "Machine Learning for Optical Emission Spectroscopy of Plasmas Generated in Water Solution", 6th JTPL, Tsuruoka, Japan, 2019(Jul), (**Invited Talk**)
34. H.Y. Chen and **C. C. Hsu**, "A Smartphone-Based Portable Gas Sensing System", 6th JTPL, Tsuruoka, Japan, 2019(Jul), (**Poster**)
35. H.Y. Chen and **C. C. Hsu**, "A Smartphone-Based Portable Gas Sensing System", 2019 APSPT-11, Kanazawa, Japan, 2019(Dec), (**Poster**)
36. 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**)
37. 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**)
38. 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**)

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.

