

ZHE CHENG

EDUCATION

<i>Degree</i>	<i>Institution</i>	<i>Field</i>	<i>Dates</i>
Ph.D.	Georgia Institute of Technology	Materials Sci. & Eng.	01/2005 - 05/2008
M.S.	Georgia Institute of Technology	Materials Sci. & Eng.	08/2001 - 12/2004
B.S.	Tsinghua Univ. (Beijing, China)	Materials Sci. & Eng.	09/1997 - 06/2001

EMPLOYMENT RECORD

<i>Title</i>	<i>Institution</i>	<i>Dates</i>
Associate Prof	Dept of Mech Eng, Colorado State Univ	08/2024 - present
Associate Prof	Dept of Mech & Mater Eng, Florida International Univ	08/2019 - 08/2024
Assistant Prof	Dept of Mech & Mater Eng, Florida International Univ	08/2013 - 07/2019
Res Investigator	Central Research & Development, DuPont	06/2008 - 04/2013

PUBLICATIONS IN DISCIPLINE

Citations based on Google Scholar

- <https://scholar.google.com/citations?user=-3eZMkQAAAAJ&hl=en>
- **Total citations for Dr. Zhe Cheng: 5654** (as of 2025-11-18)
- **h-index 28**
- **i10-index 42**

Peer-reviewed Journal Articles (* for corresponding author, underline for postdoc/graduate/undergraduate students directly supervised by Zhe Cheng)

1. Li, Wenhao; Drozd, Vadym; Li, Meng; **Cheng, Zhe***. “Mechanistic Insights into Oxygen Reduction Reaction on Metal Cathode Over BaZrO₃-Based Electrolyte under Moist Atmosphere: Interfacial Interactions and Reaction Pathways,” *Journal of Electrochemical Society* (2025), 172, 104509. [DOI:10.1149/1945-7111/ae10e2](https://doi.org/10.1149/1945-7111/ae10e2)
2. Li, Wenhao; Drozd, Vadym; Sozal, Md Shariful Islam; Li, Meng; **Cheng, Zhe***. “Mechanistic insights into oxygen reduction reaction on metal/perovskite catalysts: Interfacial interactions and reaction pathways,” *Solid State Ionics* (2025), 421, 116808. [DOI:10.1016/j.ssi.2025.116808](https://doi.org/10.1016/j.ssi.2025.116808)
3. Das, Suprabha; Drozd, Vadym; Durygin, Andriy; Sozal, Md Shariful Islam; Li, Wenhao; Bai, Xianming; Ding, Yong; Guan, Yingdong; Mao, Zhiqiang; Cinibulk, Michael; **Cheng, Zhe***. “Reactive Flash Sintering and Characterization of Bulk High Entropy Nitrides,” *Journal of the European Ceramic Society* (2025), 45 (5), 117157. [DOI:10.1016/j.jeurceramsoc.2024.117157](https://doi.org/10.1016/j.jeurceramsoc.2024.117157)
4. Jafarizadeh, Borzooye; Chowdhury, Azmal Huda; Sozal, Md Shariful Islam; **Cheng, Zhe**; Pala, Nezh; Wang, Chunlei*. “Wearable System Integrating Dual Piezoresistive and Photoplethysmography Sensors for Simultaneous Pulse Wave Monitoring,” *ACS Applied Materials & Interfaces* (2024), 16 (47), 65402. [DOI:10.1021/acsami.4c17710](https://doi.org/10.1021/acsami.4c17710)
- Joined CSU in 08/2024 -
5. Eskandariyun, Amirali; Das, Suprabha; Dubois, Diego; Saeedian, Kiyana; Durygin, Andriy; Drozd, Vadym; **Cheng, Zhe***. “Effects of processing conditions on flash sintering of commercial ZrN,” *Journal of the American Ceramic Society* (2024). [DOI:10.1111/jace.19719](https://doi.org/10.1111/jace.19719)
6. Sozal, Md Shariful Islam; Li, Wenhao; Das, Suprabha; Jafarizadeh, Borzooye; Chowdhury, Azmal Huda; Wang, Chunlei; **Cheng, Zhe***. “Fabrication and Preliminary Testing of Silver Patterned

- Cathodes for Proton Conducting IT-SOFC,” *Materials Advances* (2024), 5, 1940-1951. [DOI:10.1039/D3MA00793F](https://doi.org/10.1039/D3MA00793F)
7. Das, Suprabha; Durygin, Andriy; Drozd, Vadym; Sozal, Md Shariful Islam; **Cheng, Zhe***. “Reactive Flash Sintering of TiZrN and TiAlN Ternary Metal Nitrides,” *Journal of the European Ceramic Society* (2024), 44(4), 2037. [DOI:10.1016/j.jeurceramsoc.2023.11.079](https://doi.org/10.1016/j.jeurceramsoc.2023.11.079)
 8. Li, Wenhao; Sozal, Md Shariful Islam; Drozd, Vadym; Durygin, Andriy; **Cheng, Zhe***. “BaCo_{0.4}Fe_{0.4}Zr_{0.1}Y_{0.1}O_{3-σ} Cathode Performance for Proton Conducting Solid Oxide Fuel Cells with BaZr_{0.8-x}Ce_xY_{0.1}Yb_{0.1}O_{3-δ} Electrolytes,” *ECS Advances* (2023), 2 (4), 044502. [DOI:10.1149/2754-2734/ad040c](https://doi.org/10.1149/2754-2734/ad040c)
 9. Jafarizadeh, Borzooye; Chowdhury, Azmal Huda; Sozal, Md Shariful Islam; **Cheng, Zhe**; Pala, Nezh; Wang, Chunlei*. “Hardware and Protocol for Testing of Piezoresistive Pressure Sensors for Pulse wave Monitoring,” *IEEE Sensors Letters* (2023), 7 (8), 2502304. [DOI:10.1109/LESENS.2023.3300826](https://doi.org/10.1109/LESENS.2023.3300826)
 10. Sozal, Md Shariful Islam; Tang, Wei; Das, Suprabha; Li, Wenhao; Durygin, Andriy; Drozd, Vadym; Zhang, Cheng; Jafarizadeh, Borzooye; Wang, Chunlei; Agarwal, Arvind; Ding, Dong*; **Cheng, Zhe***. “Electrical, thermal, and H₂O and CO₂ poisoning behaviors of PrNi_{0.5}Co_{0.5}O_{3-δ} electrode for intermediate temperature protonic ceramic electrochemical cells,” *International Journal of Hydrogen Energy* (2022), 47 (51), 21817-21827. [DOI:10.1016/j.ijhydene.2022.05.011](https://doi.org/10.1016/j.ijhydene.2022.05.011)
 11. Das, Suprabha; Dubois, Diego; Sozal, Md Shariful Islam; Emirov, Yusuf; Jafarizadeh, Borzooye; Wang, Chunlei; Drozd, Vadym; Durygin, Andriy; **Cheng, Zhe***. “Synthesis and flash sintering of zirconium nitride powder,” *Journal of the American Ceramic Society* (2022), 105(6), 3925-3936. [DOI:10.1111/jace.18421](https://doi.org/10.1111/jace.18421)
 12. Xing, Junheng; Foroughi, Paniz; Mondal, Santanu; Sun, Shichen; **Cheng, Zhe***. “Facile and economical routes toward novel high-entropy metal nitride high-temperature ceramic nanograin powders,” *MRS Communications* (2022), 12, 183-187. [DOI:10.1557/s43579-022-00159-8](https://doi.org/10.1557/s43579-022-00159-8)
 13. Foroughi, Paniz; Durygin, Andriy; Sun, Shichen; **Cheng, Zhe***. “Flash sintering of tantalum-hafnium diboride solid solution powder,” *Journal of Materials Research* (2022), 1-7. [DOI:10.1557/s43578-022-00492-7](https://doi.org/10.1557/s43578-022-00492-7)
 14. Belisario, Jose; Mondal, Santanu; Khakpour, Iman, Franco Hernandez Alexandar, Durygin Andriy; **Cheng, Zhe***. “Synthesis and flash sintering of (Hf_{1-x}Zr_x)B₂ solid solution powders,” *Journal of the European Ceramic Society* (2021), 41(4), 2215-2225. [DOI:10.1016/j.jeurceramsoc.2020.12.015](https://doi.org/10.1016/j.jeurceramsoc.2020.12.015)
 15. Awadallah, Osama; Durygin, Andriy; **Cheng, Zhe***. ” Unveiling the Phase Evolution of Sol–Gel Sulfurized Cu₂ZnSnS₄ Thin Films in ppm-Level H₂S: From Binary Sulfides to Quaternary Cu-Zn-Sn-S System,” *Journal of Electronic Materials* (2021), 50, 314-324. [DOI:10.1007/s11664-020-08539-3](https://doi.org/10.1007/s11664-020-08539-3)
 16. Mondal, Santanu; Durygin, Andriy; Drozd, Vadym; Belisario, Jose; **Cheng, Zhe***. “Multicomponent bulk metal nitride (Nb_{1/3}Ta_{1/3}Ti_{1/3})N_{1-δ} synthesis via reaction flash sintering and characterizations,” *Journal of the American Ceramic Society* (2020), 103(9), 4876-4893. [DOI:10.1111/jace.17226](https://doi.org/10.1111/jace.17226)
 17. Sun, Shichen; **Cheng, Zhe***. “SrCo_{0.8}Nb_{0.1}Ta_{0.1}O_{3-δ} Based Cathodes for Electrolyte-Supported Proton-Conducting Solid Oxide Fuel Cells: Comparison with Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-δ} Based Cathodes and Implications,” *Journal of the Electrochemical Society* (2020), 167 (2), 024514. [DOI:10.1149/1945-7111/ab6bba](https://doi.org/10.1149/1945-7111/ab6bba)
 18. Sun, Shichen; **Cheng, Zhe***. “H₂S poisoning of proton conducting solid oxide fuel cell and comparison with conventional oxide-ion conducting solid oxide fuel cell,” *Journal of the Electrochemical Society* (2018), 165 (10), F836-F844. [DOI:10.1149/2.0841810jes](https://doi.org/10.1149/2.0841810jes)

19. Xing, Junheng; Foroughi, Paniz; Hernandez, Alexander Franco; Behrens, Andrés; **Cheng, Zhe***. “Facile one-step high-temperature spray pyrolysis route toward metal carbide nanopowders,” *Journal of the American Ceramic Society* (2018), 101 (12), 5323-5334. [DOI:10.1111/jace.15785](https://doi.org/10.1111/jace.15785)
20. Foroughi, Paniz; Rabiei Baboukani, Amin; Hernandez, Alexander Franco; Wang, Chunlei; **Cheng, Zhe***. “Phase Control during Synthesis of Nanocrystalline Ultrahigh Temperature Tantalum-Hafnium Diboride Powders,” *Journal of the American Ceramic Society* (2018), 101 (12), 5745-5755. [DOI:10.1111/jace.15783](https://doi.org/10.1111/jace.15783)
21. Sun, Shichen; Awadallah, Osama; **Cheng, Zhe***. “Poisoning of Nickel Based Anode for Proton Conducting Solid Oxide Fuel Cells by Hydrogen Sulfide, Carbon dioxide, and Moisture as Fuel Contaminants,” *Journal of Power Sources* (2018), 378, 255-263. [DOI:10.1016/j.jpowsour.2017.12.056](https://doi.org/10.1016/j.jpowsour.2017.12.056)
22. Awadallah, Osama; **Cheng, Zhe***. “Study of the fundamental phase formation mechanism of sol-gel sulfurized $\text{Cu}_2\text{ZnSnS}_4$ thin films using in situ Raman spectroscopy,” *Solar Energy Materials and Solar Cells* (2018), 176, 222-229. [DOI:10.1016/j.solmat.2017.11.038](https://doi.org/10.1016/j.solmat.2017.11.038)
23. Foroughi, Paniz; **Cheng, Zhe***. “Controlling phase separation of $\text{Ta}_x\text{Hf}_{1-x}\text{C}$ solid solution nanopowders during carbothermal reduction synthesis,” *Journal of the American Ceramic Society* (2017), 100 (11), 5056-5065. [DOI:10.1111/jace.15065](https://doi.org/10.1111/jace.15065)
24. Sun, Shichen; **Cheng, Zhe***. “Electrochemical Behaviors for Ag, LSCF and BSCF as Oxygen Electrodes for Proton Conducting IT-SOFC,” *Journal of the Electrochemical Society* (2017), 164(10), F3104-F3113. [DOI:10.1149/2.0121710jes](https://doi.org/10.1149/2.0121710jes)
25. Awadallah, Osama; **Cheng, Zhe***. “Formation of sol-gel based $\text{Cu}_2\text{ZnSnS}_4$ thin films using ppm-level hydrogen sulfide,” *Thin Solid Films* (2017), 625 (1), 122-130. [DOI:10.1016/j.tsf.2017.01.054](https://doi.org/10.1016/j.tsf.2017.01.054)
26. Sun, Shichen; **Cheng, Zhe***. “Effects of H_2O and CO_2 on Electrochemical Behaviors of BSCF Cathode for Proton Conducting IT-SOFC,” *Journal of the Electrochemical Society* (2017), 164(2), F81-F88. [DOI:10.1149/2.0611702jes](https://doi.org/10.1149/2.0611702jes)
27. **Cheng, Zhe***; Foroughi, Paniz; Behrens, Andrés. “Synthesis of nanocrystalline TaC powders via single-step high temperature spray pyrolysis from solution precursors,” *Ceramics International* (2017), 43(3), 3431-3434. [DOI:10.1016/j.ceramint.2016.11.177](https://doi.org/10.1016/j.ceramint.2016.11.177)
28. Foroughi, Paniz; **Cheng, Zhe***. “Understanding the morphological variation in the formation of B_4C via carbothermal reduction reaction,” *Ceramics International* (2016), 42(14), 15189-15198. [DOI:10.1016/j.ceramint.2016.06.126](https://doi.org/10.1016/j.ceramint.2016.06.126)
29. Awadallah, Osama; **Cheng, Zhe***. “In Situ Raman Monitoring of $\text{Cu}_2\text{ZnSnS}_4$ Oxidation and Related Decomposition at Elevated Temperatures,” *IEEE Journal of Photovoltaics* (2016), 6(3), 764-769. [DOI:10.1109/JPHOTOV.2016.2542479](https://doi.org/10.1109/JPHOTOV.2016.2542479)
30. Vahid Mohammadi, Armin; **Cheng, Zhe***. “Fundamentals of Synthesis, Sintering, and Chemical Stability Issues of $\text{BaZr}_{0.1}\text{Ce}_{0.7}\text{Y}_{0.1}\text{Yb}_{0.1}\text{O}_{3-\delta}$ Proton Conducting Electrolyte for SOFCs,” *Journal of Electrochemical Society*, (2015), 162 (8), F803-811. [DOI:10.1149/2.0021508jes](https://doi.org/10.1149/2.0021508jes)
31. **Cheng, Zhe**; Wang, Jeng-Han; Choi, Yong-Man; Lin, M. C.; Liu, Meilin*. “From Ni-YSZ to sulfur-tolerant anode materials for SOFCs: electrochemical behavior, *in situ* characterization, modeling, and future perspectives,” *Energy & Environmental Science* (2011), 4(11), 4380-4409. (*Invited perspectives*)
32. Yang, Lei; **Cheng, Zhe**; Liu, Meilin*, and Wilson, Lane. “New insights into sulfur poisoning behavior of Ni-YSZ anode from long-term operation of anode-supported SOFCs,” *Energy & Environmental Science*, (2010), 3, 1804-1809.
33. Yang, Lei; Wang, Shizhong; Blinn, Kevin; Liu, Mingfei; Liu, Ze; **Cheng, Zhe**; Liu, Meilin*. “Enhanced sulfur and coking tolerance of a mixed ion conductor for SOFCs: $\text{BaZr}_{0.1}\text{Ce}_{0.7}\text{Y}_{0.2-x}\text{Yb}_x\text{O}_{3-\delta}$,” *Science* (2009), 326(5949), 126-129. (*American Ceramic Society Ross Coffin Purdy Award*)

34. Yang, Lei; Zuo, Chendong; Wang, Shizhong; **Cheng, Zhe**; Liu, Meilin*. "A novel composite cathode for low-temperature SOFCs based on oxide proton conductors," *Advanced Materials* (2008), 20(17), 3280-3283.
35. Abernathy, Harry W; Koep, Eric; Compson, Charles; **Cheng, Zhe**; Liu, Meilin*. "Monitoring Ag-Cr interactions in SOFC cathodes using Raman spectroscopy," *Journal of Physical Chemistry C* (2008), 112(34), 13299-13303.
36. Choi, Songho; Wang, Jeng-Han; **Cheng, Zhe**; Liu, Meilin*. "Surface modification of Ni-YSZ using niobium oxide for sulfur-tolerant anodes in solid oxide fuel cells," *Journal of the Electrochemical Society* (2008), 155(5), B449-B454.
37. **Cheng, Zhe**; Abernathy, Harry; Liu, Meilin*. "Raman Spectroscopy of Nickel Sulfide Ni₃S₂," *Journal of Physical Chemistry C* (2007), 111(49), 17997-18000.
38. Wang, Jeng-Han; **Cheng, Zhe**; Bredas, Jean-Luc; Liu, Meilin*. "Electronic and vibrational properties of nickel sulfides from first principles." *Journal of Chemical Physics* (2007), 127(21), 214705/1-214705/8.
39. **Cheng, Zhe**; Zha, Shaowu; Liu, Meilin*. "Influence of Cell Voltage and Current on Sulfur Poisoning Behavior of Solid Oxide Fuel Cells," *Journal of Power Sources* (2007), 172, 688.
40. Zha, Shaowu; **Cheng, Zhe**; Liu, Meilin*. "Sulfur poisoning and regeneration of Ni-based anodes in solid oxide fuel cells," *Journal of the Electrochemical Society* (2007), 154, B201.
41. **Cheng, Zhe**; Liu, Meilin*. "Characterization of sulfur poisoning of Ni-YSZ anodes for solid oxide fuel cells using *in situ* Raman microspectroscopy," *Solid State Ionics* (2007), 178, 925.
42. Wu, Qi-Hui; Abernathy, Harry; **Cheng, Zhe**; Liu, Meilin*. "FTIR study of the oxygen reduction reactions." *Surface Review and Letters* (2007), 14(4), 587-591.
43. **Cheng, Zhe**; Zha, Shaowu; Liu, Meilin*. "Stability of materials as candidates for sulfur-resistant anodes of solid oxide fuel cells," *Journal of the Electrochemical Society* (2006), 153, A1302.
44. Dong, Jian; **Cheng, Zhe**; Zha, Shaowu; Liu, Meilin*. "Identification of nickel sulfides on Ni-YSZ cermet exposed to H₂ fuel containing H₂S using Raman spectroscopy," *Journal of Power Sources* (2006), 156, 461.
45. **Cheng, Zhe**; Zha, Shaowu; Aguilar, Luis; Wang, Dean; Winnick, Jack; Liu, Meilin*. "A Solid Oxide Fuel Cell Running on H₂S/CH₄ Fuel Mixtures," *Electrochemical and Solid-State Letters* (2006), 9, A31.
46. **Cheng, Zhe**; Zha, Shaowu; Aguilar, Luis; Liu, Meilin*. "Chemical, electrical, and thermal properties of strontium doped lanthanum vanadate," *Solid State Ionics* (2005), 176, 1921.
47. Zha, Shaowu; **Cheng, Zhe**; Liu, Meilin*. "A sulfur-tolerant anode material for SOFCs - Gd₂Ti_{1.4}Mo_{0.6}O₇," *Electrochemical and Solid-State Letters* (2005), 8, A406.
48. Zha, Shaowu; Tsang, Philip; **Cheng, Zhe**; Liu, Meilin*. "Electrical properties and sulfur tolerance of La_{0.75}Sr_{0.25}Cr_{1-x}Mn_xO₃ under anodic conditions." *Journal of Solid State Chemistry* (2005), 178(6), 1844-1850.
49. Aguilar, Luis; Zha, Shaowu; **Cheng, Zhe**; Winnick, Jack; Liu, Meilin*. "A solid oxide fuel cell operating on hydrogen sulfide (H₂S) and sulfur-containing fuels." *Journal of Power Sources* (2004), 135(1-2), 17-24.
50. Tang, Zilong*; Zhang, Junying; **Cheng, Zhe**; Zhang, Zhongtai. "Synthesis of nanosized rutile TiO₂ powder at low temperature," *Materials Chemistry and Physics* (2002), 77, 314.

Proceedings/Peer-reviewed Conference Papers (* for corresponding author, underline for graduate/undergraduate student directly supervised by Zhe Cheng)

1. Chowdhury, Azmal H; Jafarizadeh, Borzooye; Sozal, Md Shariful Islam; **Cheng, Zhe**; Pala, N; Wang, Chunlei*. "Flexible Piezoresistive Pressure Sensor Based on Graphene Nano Plateletes," *2023 IEEE BioSensors Conference (BioSensors)*, 1-5.
[DOI:10.1109/BioSensors58001.2023.10281069](https://doi.org/10.1109/BioSensors58001.2023.10281069)

2. Awadallah, Osama; Hernandez, Joseph; Durygin, Andriy; **Cheng, Zhe***. “In Situ Raman Monitoring of Kesterite $\text{Cu}_2\text{ZnSnS}_4$ Phase Formation from Sulfurization of Sol-gel Oxide Precursors,” *Photovoltaics Specialist Conference (PVSC), 2017 IEEE 44th*, 3473-3477. [DOI:10.1109/PVSC.2017.8366144](https://doi.org/10.1109/PVSC.2017.8366144)
3. Awadallah, Osama; **Cheng, Zhe***. “In situ Raman Characterization of $\text{Cu}_2\text{ZnSnS}_4$ Solar Absorber Materials,” *Photovoltaics Specialist Conference (PVSC), 2015 IEEE 42nd*, 1-6. [DOI:10.1109/PVSC.2015.7355595](https://doi.org/10.1109/PVSC.2015.7355595)
4. Foroughi, Paniz; **Cheng, Zhe***. “From Micron-sized Particles to Nanoparticles and Nanobelts: Structural Non-uniformity in the Synthesis of Boron Carbide by Carbothermal Reduction Reaction,” *Advances in Ceramic Armor XI: A Collection of Papers Presented at the 39th International Conference on Advanced Ceramics and Composites* (ed J. C. LaSalvia), John Wiley & Sons, Inc., Hoboken, NJ, USA (2015), 51-62. [DOI:10.1002/9781119211549.ch5](https://doi.org/10.1002/9781119211549.ch5)
5. VahidMohammadi, Armin; **Cheng, Zhe***. “Study on Sintering and Stability Issues of $\text{BaZr}_{0.1}\text{Ce}_{0.7}\text{Y}_{0.1}\text{Yb}_{0.1}\text{O}_{3-\delta}$ Electrolyte for SOFCs,” *Advances in Solid Oxide Fuel Cells and Electronic Ceramics: A Collection of Papers Presented at 39th International Conference on Advanced Ceramics and Composites* (eds N. P. Bansal, M. Kusnezoff and K. Shimamura), John Wiley & Sons, Inc., Hoboken, NJ, USA (2015) 21-29. [DOI:10.1002/9781119211501.ch3](https://doi.org/10.1002/9781119211501.ch3)
6. **Cheng, Zhe***; Liu, Meilin*, “Rational Design of Sulfur-Tolerant Anode Materials for Solid Oxide Fuel Cells,” *ECS Transactions* (2013), 58(2), Electrochemical Synthesis of Fuels 2, 217-230. [DOI:10.1149/05802.0217ecst](https://doi.org/10.1149/05802.0217ecst)
7. Zha, Shaowu; **Cheng, Zhe**; Liu, Meilin*. “ $\text{Gd}_2\text{Ti}_{2-x}\text{Mo}_x\text{O}_7$ -based anode materials for H_2S -air solid oxide fuel cells,” *ECS Transactions* (2006), 1(7), Solid State Ionic Devices IV, 293-302.
8. **Cheng, Zhe**; Sacks, Michael D.*; Wang, Chang-An.; Yang, Zhaohui. “Preparation of nanocrystalline silicon carbide powders by carbothermal reduction,” *Ceramic Transactions* (2003), 154, 15.
9. **Cheng, Zhe**; Sacks, Michael D.*; Wang, Chang-An. “Synthesis of nanocrystalline silicon carbide powders,” *Ceramic Engineering and Science Proceedings* (2003), 24, 23-32.
10. Jain, Anubhav; Sacks, Michael D.*; Wang, Chang-An; Middlemans, Michael; **Cheng, Zhe**. “Processing of nanocrystalline zirconium carbide powders.” *Ceramic Engineering and Science Proceedings* (2003), 24, 41-49.
11. Wang, Chang-An; Sacks, Michael D.*; Staab, Greg A.; **Cheng, Zhe**. “Solution-based processing of nanocrystalline SiC.” *Ceramic Engineering and Science Proceedings* (2002), 23(4), 701-709.

Chapters in Books

- **Cheng, Zhe**; Wang, Jeng-Han; Liu, Meilin. “Chapter 2 - Anodes,” in *Solid Oxide Fuel Cells: Materials Properties and Performance*, edited by Fergus, Jeffrey W.; Hui, Rob; Li, Xianguo; Wilkinson, David P.; Zhang, Jiujun. CRC Press, Taylor & Francis Group, Boca Raton, FL (2009), 73-129.

OTHER PUBLICATIONS

N/A

PRESENTED PAPERS, AND LECTURES

Presentations (* for corresponding author, underline for postdoc/graduate/undergraduate student directly supervised by Zhe Cheng)

1. Wenhao Li, Meng Li, **Zhe Cheng***. “Mechanistic Insights into Oxygen Reduction Reaction on Metal/Perovskite Catalysts: Interfacial Interactions in Moist Atmosphere” presented at the 248th *Electrochemical Society Meeting*, Chicago, Illinois, 10/2025. (Oral).
2. **Zhe Cheng***, Suprabha Das, Vadym Drozd, Andriy Durygin, Md Shariful Sozal, Wenhao Li, Xianming Bai, Yong Ding, Yongdong Guan, Zhiqiang Mao, Michael Cinibulk. “Synthesis and Characterization of High Entropy Nitrides,” presented at *16th Pacific Rim Conference on Ceramic and Glass Technology (PACRIM 16)*, Vancouver, Canada, 05/2025. (Oral, **invited**).
3. **Zhe Cheng***. “Synthesis, Processing, and Characterization of Multi-component High-Temperature Ceramics,” presented at *49th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2025. (Oral, **invited**).
4. Wenhao Li, Vadym Drozd, Meng Li, **Zhe Cheng***. “Investigation of Oxygen Reduction Reaction on Pt and Ag over BaZrO₃ via Density Functional Theory” presented at *49th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2025. (Oral).
5. Raiyan Sabroj, Andriy Durygin, **Zhe Cheng***. “Finite Element Modelling of zirconium nitride flash sintering” presented at *49th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2025. (Oral).
6. Suprabha Das, Vadym Drozd, Andriy Durygin, Md Shariful Sozal, Michael Cinibulk, Jessie Smith, Xianming Bai, Yong Ding, **Zhe Cheng***. “Synthesis and Characterization of High Entropy Nitrides,” presented at *Materials Science & Technology Technical Meeting & Exhibition (MS&T23)*, Columbus, Ohio, 10/2023. (Oral)
7. Suprabha Das, Andriy Durygin, Vadym Drozd, Md Shariful Sozal, Jessie Smith, **Zhe Cheng***. “Reaction Flash Sintering of Ti_{0.5}Zr_{0.5}N and Ti_{0.5}Al_{0.5}N Ternary Metal Nitrides,” presented at *Materials Science & Technology Technical Meeting & Exhibition (MS&T23)*, Columbus, Ohio, 10/2023. (Oral)
8. Wenhao Li, Md Shariful Sozal, Vadym Drozd, Andriy Durygin, **Zhe Cheng***. “BaCo_{0.4}Fe_{0.4}Zr_{0.1}Y_{0.1}O_{3-σ} Cathode Performance for Proton Conducting Solid Oxide Fuel Cells with BaZr_{1-x}Ce_xY_{0.1}Yb_{0.1}O_{3-δ} Electrolytes” presented at the *243rd Electrochemical Society Meeting*, Boston, Massachusetts, 06/2023. (Oral).
9. Md Shariful Sozal, Wenhao Li, Suprabha Das, Borzooye Jafarizadeh, Azmal Chowdhury, Andriy Durygin, Vadym Drozd, Chunlei Wang, **Zhe Cheng***. “Fabrication and Electrochemical Testing of Silver Pattern Cathodes for Proton Conducting IT-SOFC,” presented at the *243rd Electrochemical Society Meeting*, Boston, Massachusetts, 05/2023. (Oral)
10. Suprabha Das, Andriy Durygin, Vadym Drozd, Amirali Eskandariyun, Jessie Smith, **Zhe Cheng***. “Reaction Flash Sintering of Ternary Metal Nitrides,” presented at *47th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2023. (Oral)
11. Suprabha Das, Amirali Eskandariyun, Md Shariful Sozal, Vadym Drozd, Andriy Durygin, Michael Cinibulk, **Zhe Cheng***. “Synthesis and Characterization of High Entropy Nitrides,” presented at *47th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2023. (Oral)
12. Wenhao Li, Md Shariful Sozal, Vadym Drozd, Andriy Durygin, **Zhe Cheng***. “BaCo_{0.4}Fe_{0.4}Zr_{0.1}Y_{0.1}O_{3-σ} Cathode Performance for Proton Conducting Solid Oxide Fuel Cells with BaZr_{1-x}Ce_xY_{0.1}Yb_{0.1}O_{3-δ} Electrolytes” presented at *47th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2023. (Oral).
13. Md Shariful Sozal, Wenhao Li, Suprabha Das, Borzooye Jafarizadeh, Azmal Chowdhury, Andriy Durygin, Vadym Drozd, Chunlei Wang, **Zhe Cheng***. “Fabrication and Electrochemical Testing

- of Silver Pattern Cathodes for Proton Conducting IT-SOFC” presented at *47th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2023. (Oral)
14. Md Shariful Islam Sozal, Wei Tang, Suprabha Das, Wenhao Li, Andriy Durygin, Vadym Drozd, Cheng Zhang, Borzooye Jafarizadeh, Chunlei Wang, Arvind Agarwal, Dong Ding, **Cheng, Zhe*** “Electrical, Thermal, and H₂O and CO₂ Poisoning Behaviors of PrNi_{0.5}Co_{0.5}O_{3-δ} Cathode for Proton Conducting Intermediate Temperature Solid Oxide Fuel Cell,” presented at the *242nd Electrochemical Society Meeting*, Atlanta, Georgia, 10/2022. (**Invited** oral)
 15. Amirali Eskandariyun, Diego Dubois, Suprabha Das, Andriy Durygin, **Zhe Cheng***. “Flash Sintering of MWCNT-reinforced ZrN Composite,” presented at *46th International Conference & Exposition on Advanced Ceramics & Composites*, 01/2022. (Virtual)
 16. Diego Dubois, Amirali Eskandariyun, Suprabha Das, Andriy Durygin, **Zhe Cheng***. “Flash Sintering of Commercial Zirconium Nitride Powders,” presented at *46th International Conference & Exposition on Advanced Ceramics & Composites*, 01/2022. (Virtual)
 17. Suprabha Das, Diego Dubois, Md Shariful Sozal, Andriy Durygin, Vadym Drozd, **Zhe Cheng***. “Synthesis and Flash Sintering of Zirconium Nitride Powder,” presented at *46th International Conference & Exposition on Advanced Ceramics & Composites*, 01/2022. (Virtual)
 18. Md Shariful Sozal, Andriy Durygin, Vadym Drozd, Suprabha Das, Borzooye Jafarizadeh, Chunlei Wang, **Zhe Cheng***. “Effects of H₂O and CO₂ on Electrochemical Behaviors of PrNi_{0.5}Co_{0.5}O_{3-δ} (PNC) cathode for Proton Conducting IT-SOFC,” presented at *46th International Conference & Exposition on Advanced Ceramics & Composites*, 01/2022. (Virtual)
 19. Md Shariful Sozal, Vadym Drozd, Andriy Durygin, **Zhe Cheng***. “Synthesis, Processing, and Characterizations of Ba(Zr_{0.4}Ce_{0.4}Y_{0.1}Yb_{0.1})O_{3-δ} and Related Proton Conducting Electrolytes,” presented at *45th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, 02/2021. (Virtual)
 20. Jose Belisario, Santanu Mondal, Suprabha Das, Vadym Drozd, Andriy Durygin, **Zhe Cheng***. “Powder Synthesis, Flash Sintering, and Characterization of Multi-component High Temperature Ceramics,” presented at the *45th International Conference & Exposition on Advanced Ceramics & Composites*, 02/2021. (**Invited** virtual)
 21. Jose Belisario; Santanu Mondal; Iman Khakpour, Alexander Franco, Andriy Durygin, **Zhe Cheng***; “Synthesis and Flash Sintering of (Hf_{1-x}Zr_x)B₂ Solid Solution Fine Powder,” presented at *Materials Science & Technology 2020 (MS&T20)*, 10/2020. (**Invited** virtual)
 22. Santanu Mondal, Andriy Durygin, Jose Belisario, Vadym Drozd, **Zhe Cheng***. “Synthesis of multicomponent bulk metal nitride (Nb_{1/3}Ta_{1/3}Ti_{1/3})N via reaction flash sintering,” presented at the *44th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2020. (Oral)
 23. Jose Belisario; Santanu Mondal; **Zhe Cheng***; Andriy Durygin. “Low-cost synthesis of (Hf_{1-x}Zr_x)B₂ solid solution fine powders via CTR and AMR methods,” presented at the *44th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2020. (Oral)
 24. Xing, Junheng; Foroughi, Paniz; Hernandez, Alexander Franco; **Cheng, Zhe***. “Facile and low-cost routes toward nanocrystalline high-entropy high temperature ceramic powders,” presented at the *43rd International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2019. (Oral)
 25. Foroughi, Paniz; Durygin, Andriy; **Cheng, Zhe***, “Synthesis & ‘Flash’ Sintering of Ta_{0.5}Hf_{0.5}B₂ Solid Solution Nanopowders,” presented at the *43rd International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2019. (Oral)

26. Sun, Shichen; **Cheng, Zhe*** “Comparison of H₂S Poisoning for Proton Conducting SOFC (PC-SOFC) Versus Oxide Ion Conducting SOFC (OC-SOFC),” presented at *the Materials Science & Technology 2018* (MS&T18), Columbus, Ohio, 10/2018. (Poster)
27. Xing, Junheng; Foroughi, Paniz; Hernandez, Alexander Franco; **Cheng, Zhe*** “Facile and low-cost routes toward nanocrystalline high-entropy ultra-high temperature ceramic powders,” presented at *the Materials Science & Technology 2018* (MS&T18), Columbus, Ohio, 10/2018. (Oral)
28. Foroughi, Paniz; Durygin, Andriy; **Cheng, Zhe***, “Preliminary Results on Rapid Field-Assisted Sintering of Tantalum-Hafnium Diboride Solid Solution Powders,” presented at *the Materials Science & Technology 2018* (MS&T18), Columbus, Ohio, 10/2018. (Oral)
29. Sun, Shichen; **Cheng, Zhe***. “H₂S Poisoning for Proton Conducting SOFC,” presented at the 2018 Americas International Meeting on Electrochemistry and Solid State Science (AiMES 2018), Cancun, Mexico, 10/2018. (Oral)
30. Sun, Shichen; **Cheng, Zhe***. “Improvement of Cathode Materials for Proton Conducting Intermediate Temperature Solid Oxide Fuel Cells,” presented at the 2018 Americas International Meeting on Electrochemistry and Solid State Science (AiMES 2018), Cancun, Mexico, 10/2018. (Oral)
31. **Cheng, Zhe***. “Novel High Temperature Carbide and Boride Ceramics for Direct Power Extraction Electrode Applications,” presented at *DOE NETL 2018 Annual Review Meeting for Crosscutting Research*, Pittsburg, Pennsylvania, 04/2018. (Oral)
32. Foroughi, Paniz; **Cheng, Zhe***. “Phase Control during Synthesis of Nanocrystalline Ultrahigh Temperature Ta_xHf_{1-x}B₂ Solution Powders,” presented at the *42nd International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2018. (Oral)
33. Xing, Junheng; **Cheng, Zhe***. “Facile one-step high-temperature spray pyrolysis route toward ultrafine metal carbide nanocrystalline powders,” presented at the *42nd International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2018. (Oral)
34. Sun, Shichen; **Cheng, Zhe***. “Evaluation of Cathode Materials for Proton Conducting Intermediate Temperature Solid Oxide Fuel Cells,” presented at the *42nd International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2018. (Oral)
35. Sun, Shichen; **Cheng, Zhe***. “In-depth study of the poisoning effects for H₂S and CO₂ on the Hydrogen Electrode for Proton Conducting SOFC,” presented at the *42nd International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2018. (Oral)
36. Awadallah, Osama; **Cheng, Zhe*** “In Situ Raman Characterization of CZTS Phase Formation from Sulfurization of Sol-gel Oxide Precursors in ppm-level H₂S-Containing Atmosphere,” presented at the *Materials Science & Technology 2017* (MS&T17), Pittsburg, Pennsylvania, 10/2017. (Poster)
37. **Cheng, Zhe***; Xing, Junheng; Foroughi, Paniz; Behrens, Andres. “Synthesis of Nanocrystalline Ultrahigh Temperature Ceramic Powders via Rapid Single-step High Temperature Spray Pyrolysis,” presented at the *Materials Science & Technology 2017* (MS&T17), Pittsburg, Pennsylvania, 10/2017. (Oral)
38. Foroughi, Paniz; **Cheng, Zhe***. “Microstructure and Phase Control during Synthesis of Nanocrystalline Ultrahigh Temperature Tantalum Hafnium Diboride Powders (Ta_xHf_{1-x}B₂) via Carbothermal/Borothermal Reduction Reaction,” presented at the *Materials Science & Technology 2017* (MS&T17), Pittsburg, Pennsylvania, 10/2017. (Oral)
39. Foroughi, Paniz; Zhang, Cheng; Agarwal, Arvind; Cheng, **Zhe Cheng***. “Understanding and Control of Phase Separation in Synthesis of Nanocrystalline Ta_xHf_{1-x}C Powders,” presented at the *Materials Science & Technology 2017* (MS&T17), Pittsburg, Pennsylvania, 10/2017. (Oral)

40. Sun, Shichen; **Cheng, Zhe***. “Understanding Anode and Cathode Reaction Mechanisms for Proton Conducting Intermediate Temperature Solid Oxide Fuel Cells,” presented at the 232nd Electrochemical Society Meeting, National Harbor, Maryland, 10/2017. (**Invited** oral presentation)
41. Awadallah, Osama; Hernandez, Joseph D; Durygin, Andriy; **Cheng, Zhe***. “In Situ Raman Monitoring of Kesterite $\text{Cu}_2\text{ZnSnS}_4$ Phase Formation from Sulfurization of Sol-gel Oxide Precursors,” presented at the 44th *IEEE Photovoltaics Specialist Conference (PVSC)*, Washington, DC, 06/2017. (Oral)
42. Sun, Shichen; **Cheng, Zhe***. “Understanding the Cathode Reaction Process for Proton Conducting Intermediate Temperature Solid Oxide Fuel Cells Using Comparison Between BSCF and Other Cathode Materials,” presented at the 231st *Electrochemical Society Meeting*, New Orleans, Louisiana, 06/2017. (Oral)
43. Sun, Shichen; **Cheng, Zhe***. “Understand the Hydrogen Electrode Reaction for Proton Conducting SOFC via Controlled Poisoning Experiments Using Hydrogen Sulfide and Carbon Dioxide,” presented at the 231st *Electrochemical Society Meeting*, New Orleans, Louisiana, 06/2017. (Poster)
44. Foroughi, Paniz; **Cheng, Zhe***. “Synthesis, Characterization, and Sintering of Nanocrystalline Tantalum-Hafnium Carbide Solid Solution Powders,” presented at the 41th *International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2017. (Oral)
45. Sun, Shichen; **Cheng, Zhe***. “Understanding proton-conducting cathode for intermediate temperature proton-conducting SOFC,” presented at the 41th *International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2017. (Oral)
46. Sun, Shichen; **Cheng, Zhe***. “Understanding Poisoning of Proton Conducting SOFC Anode by Hydrogen Sulfide and Carbon Dioxide,” presented at the 41th *International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2017. (Oral)
47. Awadallah, Osama; **Cheng, Zhe***. “Preparation of $\text{Cu}_2\text{ZnSnS}_4$ thin films using ppm-level Hydrogen Sulfide,” presented at the Materials Science & Technology 2016 (MS&T16), Salt Lake City, Utah, 10/2016. (Oral)
48. Awadallah, Osama; **Cheng, Zhe***. “In-situ Raman Monitoring of $\text{Cu}_2\text{ZnSnS}_4$ (CZTS) Solar Absorber Material at Elevated Temperatures,” presented at the Materials Science & Technology 2016 (MS&T16), Salt Lake City, Utah, 10/2016. (Oral)
49. Foroughi, Paniz; **Cheng, Zhe***. “Understanding Size and Morphology Control of Boron Carbide Ceramic Powders Synthesized via Carbothermal Reduction Reaction,” presented at the Materials Science & Technology 2016 (MS&T16), Salt Lake City, UT, 10/2016. (Oral)
50. Foroughi, Paniz; **Cheng, Zhe***. “Synthesis of Nanocrystalline Ultrahigh Temperature Tantalum Hafnium Carbide Solid Solution Powders and Related Nanocomposites,” presented at the Materials Science & Technology 2016 (MS&T16), Salt Lake City, Utah, 10/2016. (Oral)
51. Sun, Shichen; **Cheng, Zhe***. “Poisoning of Proton Conducting SOFC By Hydrogen Sulfide and Carbon Dioxide Fuel Contaminants,” presented at the 229th Electrochemical Society (ECS) Meeting, San Diego, California, 06/2016. (Oral)
52. Sun, Shichen; **Cheng, Zhe***. “ $\text{Ba}_{0.5}\text{Sr}_{0.5}\text{Co}_{0.8}\text{Fe}_{0.2}\text{O}_3$ Cathode for Intermediate Temperature Proton-Conducting Solid Oxide Fuel Cells,” presented at the 229th Electrochemical Society (ECS) Meeting, San Diego, California, 06/2016. (Oral)
53. Awadallah, Osama; **Cheng, Zhe***. “*In situ* Raman Monitoring of $\text{Cu}_2\text{ZnSnS}_4$ Decomposition and Oxidation at Elevated Temperatures,” presented at the 2016 *Materials Research Society (MRS) Spring Meeting*, Phoenix, Arizona, 03/2016. (Poster)

54. Awadallah, Osama; **Cheng, Zhe***, “Sol Gel Sulfurization of $\text{Cu}_2\text{ZnSnS}_4$ Thin Films Using ppm Level Hydrogen Sulfide,” presented at the *2016 Materials Research Society (MRS) Spring Meeting*, Phoenix, Arizona, 03/2016. (Poster)
55. Sun, Shichen; **Cheng, Zhe***. “Stability and Performance Issues of BSCF as Oxygen Electrode Material for Intermediate Temperature Proton-conducting SOFC/SOEC,” presented at the *40th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2016. (Oral)
56. Foroughi, Paniz; **Cheng, Zhe***. “Synthesis of Nanocrystalline Ultrahigh Temperature Tantalum Hafnium Carbide Solid Solution ($\text{Ta}_x\text{Hf}_{1-x}\text{C}_y$) Powders,” presented at the *40th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2016. (Oral)
57. Foroughi, Paniz; **Cheng, Zhe***. “Understanding the Morphological Variation in the Formation of B_4C via Carbothermal Reduction Reaction,” presented at the *40th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2016. (Oral)
58. Awadallah, Osama; **Cheng, Zhe***. “In situ Raman Characterization of $\text{Cu}_2\text{ZnSnS}_4$ Solar Absorber Material,” presented at the *42nd IEEE Photovoltaics Specialist Conference (PVSC)*, New Orleans, Louisiana, 06/2015 (Oral)
59. VahidMohammadi, Armin; **Cheng, Zhe***. “Sinterability and Chemical Stability Issues of $\text{BaZr}_{0.1}\text{Ce}_{0.7}\text{Y}_{0.1}\text{Yb}_{0.1}\text{O}_{3-\delta}$ Proton Conductive Electrolyte for SOFCs,” presented at the *227th Electrochemical Society Meeting*, Chicago, Illinois, 05/2015. (Oral)
60. VahidMohammadi, Armin; **Cheng, Zhe***. “Sintering Issues and Thermo-Chemical Stability of BZCYYb Proton Conductive Electrolyte for SOFCs,” presented at the *144th TMS Meeting*, Orlando, Florida, 03/2015. (Oral)
61. VahidMohammadi, Armin; **Cheng, Zhe***. “Sinterability and Chemical Stability Issues of $\text{BaZr}_{0.1}\text{Ce}_{0.7}\text{Y}_{0.1}\text{Yb}_{0.1}\text{O}_{3-\delta}$ Proton Conductive Electrolyte for SOFCs,” presented at the *39th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2015. (Oral)
62. Foroughi, Paniz; **Cheng, Zhe***. “Structural non-Uniformity and Reaction Mechanisms in the Synthesis of Boron Carbide,” presented at the *39th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2015. (Oral)
63. **Cheng, Zhe**; Zha, Shaowu; Abernathy, Harry; Liu, Meilin. “Experimental investigation of the sulfur poisoning process for solid oxide fuel cell anodes,” presented at the *31st International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, 01/2007. (Oral)
64. **Cheng, Zhe**; Zha, Shaowu; Liu, Meilin. “Sulfur-anode interaction for solid oxide fuel cells,” presented at the *Workshop on Industry & University Cooperative Research Centers (I/UCRC) for Fuel Cells at University of South Carolina – Georgia Tech*, Atlanta, Georgia, 02/2007. (Poster)
65. **Cheng, Zhe**; Zha, Shaowu; Choi, Yong Man; Choi, Songho; Liu, Meilin. “Sulfur-tolerant anodes for solid oxide fuel cells,” presented at the 1st meeting for the Strategic Energy Institute (SEI) at Georgia Institute of Technology, Atlanta, Georgia, 03/2006. (Poster)
66. **Cheng, Zhe**; Zha, Shaowu; Liu, Meilin. “Stability of materials as candidate for sulfur-resistant anode of solid oxide fuel cells,” presented at the *Workshop on Electrochemistry, MEMS and Nanotechnology of the Georgia local section of the Electrochemical Society*, Atlanta, Georgia, 09/2005. (Oral)
67. **Cheng, Zhe**; Sacks, Michael D.; Wang, Chang-An. “Processing of nanocrystalline SiC using solution-based precursors,” presented at the *27th International Conference & Exposition on Advanced Ceramics & Composites*, Cocoa Beach, Florida, 01/2003. (Oral)

Papers to be Submitted (* for corresponding author, underline for postdoc/graduate/undergraduate student directly supervised by Zhe Cheng)

1. Xing, Junheng; Foroughi, Paniz; Rabiei Baboukani, Amin; Wang, Chunlei; **Cheng, Zhe***. “Economical synthesis of high-entropy metal diboride ultra-high temperature ceramic nanopowders *under preparation*.”

FUNDED RESEARCH

1. **Zhe Cheng (PI)**, Donald Radford (co-PI), Chris Weinberger (co-PI), “*Fundamental Mechanism for Flash Sintering of Highly Conductive High Temperature Ceramics*”, DOE (Award #DE-SC0026124), 2025-2027, **\$284,406**
2. **Zhe Cheng (PI)**, “*CAREER: Fundamentals and New Materials for Hydrogen Electrode of Intermediate Temperature Proton Conducting Solid Oxide Fuel Cells*,” NSF (Award #2503035, transferred from FIU), 2025, **\$193,505**.
- Joined CSU in 08/2024 -
3. **Zhe Cheng (PI at FIU)**, “FMRG: Eco: Sustainable Route to 3D Solid-State Sodium-ion Battery by Direct Ink Writing and Capillary Rise Infiltration,” NSF, 2021-2025, **\$100,000** to ZC as a subaward from U Penn.
4. **Zhe Cheng (PI)**, Andriy Durygin (co-PI), Vadym Drozd (co-PI), “*Novel additive manufacturing for plasma facing materials - creating a research pathway for minority students*,” DOE (Award #DE-SC0023647), 2023-2025, **\$375,000**.
5. **Zhe Cheng (PI)**, Andriy Durygin (co-PI), Vadym Drozd (co-PI), “*Fundamental Mechanism for Flash Sintering of Highly Conductive High Temperature Ceramics*”, DOE (Award #DE-SC0022152), 2021-2024, **\$415,594**.
6. **Zhe Cheng (PI)**, “*CAREER: Fundamentals and New Materials for Hydrogen Electrode of Intermediate Temperature Proton Conducting Solid Oxide Fuel Cells*,” NSF (Award #1848305), 2019-2025, **\$378,329**.
7. **Zhe Cheng (PI)**, “*Economic Fabrication of Nano-sized High Temperature and Ultrahigh Temperature Ceramic Solid Solution Materials*.” NSF (Award#1635957), 2016-2021, **\$300,000**.
8. **Zhe Cheng (PI)** and Arvind Agarwal (co-PI), “*Novel High Temperature Carbide and Boride Ceramics for Direct Power Extraction Electrode Applications*.” DOE (Award #DE-FE0026325), 2015-2019, **\$249,970** (\$220,000 to ZC)
9. **Zhe Cheng (PI)**, “*Environmental Friendly Processing of Low Cost Flexible Copper Zinc Tin Sulfide Solar Cells*.” NASA - Florida Space Research Program (NASA - FSRP), 2014-2016, **\$25,000**
10. **Zhe Cheng (PI at FIU)** and Sung Jun Kim (PI at Univ of Miami), “*Advanced Integrated Solar Hydrogen Cell via Novel Nano Materials*.”, FIU-UM Nano Cross Research Exchange Forum (FIU-UM Nano-CREF), 2014-2015 \$50,000 (**\$25,000** to ZC at FIU)

PATENT DISCLOSURES, APPLICATIONS, AND AWARDS

1. Das, Suprabha; **Cheng, Zhe**; Durygin, Andriy, “High entropy nitride ceramics and methods of synthesizing the same,” US Patent 11691923 (2023)
2. **Cheng, Zhe**; Foroughi, Paniz; Behrens, Andrés, “Synthesis of high temperature ceramic powders,” US Patent 9,919,973 (2018).
3. Yang, Lei; **Cheng, Zhe**; Liu, Ze; Liu, Meilin. “Chemical compositions, methods of making the chemical compositions, and structures made from the chemical compositions,” US Patent 8,932,781 (2015).

4. Cheng, Lap-tak; **Cheng, Zhe**; Lai, Cheng-yu; Lu, Meijun. "Etching composition," US Pat. Appl. (2012), US20120180852.
5. Tang, Zilong; Zhang, Junying; Zhang, Zhongtai; **Cheng, Zhe**; Luo, Shaohua. "Manufacture of nanometered rutile titania at low temperatures," CN Pat. Appl. (2002), CN1351962.

PROFESSIONAL HONORS, PRIZES, FELLOWSHIPS

External

- Young Faculty Travel Award, The Electrochemical Society, 2013
- Ross Coffin Purdy Award (co-recipient), The American Ceramic Society, 2010
- Best Oral Presentation Award, Georgia local section of the Electrochemical Society, 2005
- Outstanding M.S. Thesis Award, School of Materials Science & Engineering, Georgia Institute of Technology, 2005

Competitive Awards/Fellowships/Grants to Supervised Students

- FIU College of Engineering & Computing Outstanding Doctoral Degree Award
 - Paniz Foroughi - 2018 summer
- FIU University Graduate School (UGS) Dissertation Year Fellowship (DYF, full stipend plus tuition waver for 2 semesters)
 - Shariful Sozal - 2024 spring and summer
 - Suprabha Das - 2023 summer and fall
 - Shichen Sun - 2018 summer and fall
 - Paniz Foroughi - 2018 spring and summer
 - Osama Awadallah - 2018 spring and summer
- FIU University Graduate School (UGS) Doctoral Evidence Acquisition (DEA) Fellowship (full stipend plus tuition waiver for 1 semester)
 - Md Shariful Sozal - 2023 summer
 - Osama Awadallah - 2017 spring and summer
 - Paniz Foroughi - 2017 spring

LIST OF COURSES TAUGHT

Courses Taught at CSU - List by Course Number

1. *CSU MECH331A Introduction to Engineering Materials* (MECH undergraduate required)
 - 2024 fall (42 enrolled)
2. *CSU MSE505 Kinetics of Materials* (MSE graduate)
 - 2025 spring (1 enrolled)

Courses Previously Taught at FIU

3. *EGN3365 Materials Engineering* (ME undergraduate required)
 - 2014 - 2017
4. *EMA3702 Mechanics of Materials* (ME undergraduate required)
 - 2016 - 2024
5. *EMA4303/5305 Electrochemical Engineering* (MSE graduate & ME undergrad elective)
 - 2017 - 2023
6. *EMA5001 Physical Properties of Materials* (MSE graduate core course)
 - 2014 - 2024
7. *EMA5646 Ceramic Processing* (MSE graduate elective)

- 2015 - 2022
8. FIU Others
- EML4905 Senior Design (2014 spring, 2014 fall, 2015 fall, 2016 spring)
 - EML6908 Independent Study (2014-2023)
 - EML6910 Supervised Research (2014-2023)
 - EML7979 Ph.D. Dissertation (2015-2023)

OFFICES HELD IN PROFESSIONAL SOCIETIES

- Member-at-large of the Electrochemical Society (ECS) High Temperature Energy, Materials, & Processes (H-TEMP)
- Associate editor at the Journal of the American Ceramic Society (JACerS)

OTHER PROFESSIONAL ACTIVITIES AND PUBLIC SERVICE

- Member of the American Ceramics Society (ACerS)
- Reviewer for the following journals
 - *Catalysis*
 - *Electrochemical Acta*
 - *Electrochemistry Communication*
 - *International Journal of Hydrogen Energy*
 - *International Journal of Materials Research*
 - *Journal of Alloys and Compounds*
 - *Journal of Power Sources*
 - *Journal of the American Ceramic Society*
 - *Journal of the Electrochemical Society*
 - *Materials Letters*
 - *Nature Communications*
 - *Powder Technology*
- Grant reviewer for the following funding agencies
 - NSF for programs of Ceramics (CER), Materials Engineering & Processing (MEP), Nanomanufacturing (NM), and Small Business Innovation Research (SBIR).
 - DOE for programs of BES, SBIR, and early career investigator.
 - ARO
- Guest speaker to introduce the topic of materials and chemical engineering for American Heritage School (AHS) high school student engineering club

UNIVERSITY SERVICE

Service to CSU MECH Department or School of Materials Science & Engineering (SMSE)

- MECH T & P committee, 2024 – present
- SMSE 1st Materials Research Symposium organizer, 2024 - present

Service to FIU MME Department

- Co-graduate program director (co-GPD) for the MME department, 2018 summer – 2018 fall and 2022 fall - present
- Graduate program director (GPD) for the MME department, 2019 spring – 2020 summer
- Contact person/coordinator for MME online course offerings, 2018 summer - present

- Graduate committee member and serve to evaluate Ph.D. applicants, 2014-2018

Service to FIU

- Judge for University Graduate School (UGS) graduate student poster competition 2018, 2019