Yingwen Cheng Ph.D.

Department of Chemistry and Biochemistry, Northern Illinois University
411 La Tourette Hall, DeKalb, IL 60115
E-mail: ycheng@niu.edu ; Phone: (815)753-1131 (office)
http://yingwencheng.org

(updated 09/2022)

A. Appointment

Assistant Professor Northern Illinois University, Dekalb, IL, 2018-Present
Department of Chemistry and Biochemistry

B. Education and Training

Postdoctoral Research Associate; Pacific Northwest National Laboratory, Richland WA (2013-2017)
Ph.D. in Chemistry; Duke University (with Prof. Jie Liu), Durham NC (2013)
B.Eng. in Chemical Engineering and **B.S.** in Chemistry; Shandong University, Shandong, China (2008)

C. Honors and Awards

1. Nanoscale Emerging Investigator Award (nominated, 2023)
2. Program Chair (elected), Division of Energy and Fuels, American Chemical Society (2023)
3. Doctoral New Investigator Award, American Chemical Society Petroleum Research Fund (2021)
4. Outstanding performance award, PNNL (2013)
5. Nanoscience program fellowship, Duke University (2009, 2010)
6. Distinguished graduate honor of Shandong Province, China (2008)
7. National scholarship of China (2007)
8. Excellent student award of Shandong Province (2005)
9. First-class, excellent student scholarship of Shandong University (2004, 2006, 2007)
10. Second-class, excellent student scholarship of Shandong University (2005)

D. Service

Northern Illinois University

- Executive Committee, Department of Chemistry and Biochemistry (2020-2022)
- Graduate Admission Committee, Department of Chemistry and Biochemistry (2018-present)
- Library Committee, Department of Chemistry and Biochemistry (2018-present)
- Space and Facilities Committee, Department of Chemistry and Biochemistry (2018-present)
- Judge, Conference on Undergraduate Research and Engagement (2020-present)

External

- Program Co-Chair (2023), Division of Energy and Fuels, American Chemical Society
- Member, Glenn Award Selection Committee, Division of Energy and Fuels, American Chemical Society (2021-present)
- Chair (acting), Glenn Award Selection Committee, Division of Energy and Fuels, American Chemical Society (2022)

- Chair, Student Award Committee, Division of Energy and Fuels, American Chemical Society (2022-present)
- Member (2022-present) and Chair (2023), Programing Committee, Division of Energy and Fuels, American Chemical Society.

Symposium organizing

- Lead organizer for symposium "Electrochemistry-enabled catalysis for energy, chemicals and materials" at the 263rd ACS National Meeting, San Diego, CA, March, 2022.
- Lead organizer for symposium "Electrochemistry-enabled catalysis for energy, chemicals and materials" at the 262nd ACS National Meeting, Atlanta, GA, August, 2021.
- Co-organizer for symposium "Electrochemistry-enabled catalysis for energy, chemicals and materials" at the 261st ACS National Meeting, virtual March 2021
- Co-organizer for symposium "Electrochemistry-enabled catalysis for energy, chemicals and materials" at the 260th ACS National Meeting, San Francisco, CA August 2020
- Co-organizer for symposium "Electrochemistry-enabled catalysis for energy, chemicals and materials" at the 259th ACS National Meeting, Philadelphia, PA March 2020
- Lead organizer for symposium "Sustainable Energy and Water via Innovative Electrocatalytic, Photocatalytic and Hybrid Catalytic Systems" at the 258th ACS National Meeting, San Diego, CA, August, 2019.
- Lead organizer for symposium "Sustainable Energy Conversion via Innovative Electrocatalysis and Photocatalysis" at the 257th ACS National Meetings, Orlando, FL Spring 2019.

Reviewer for academic journals (~ 30 per year)

- (~ 30 high impact journals): *Science Advances, Nature Communications, Advanced Materials, CHEM, Angewandte Chemie, Advanced Energy Materials, Advanced Functional Materials, ACS Nano, ACS Catalysis, Nano Energy, Energy & Environmental Sciences, NPG Asia Materials, Journal of Materials Chemistry A, Scientific Reports, Small, Small Methods, Dalton Transactions, ChemSusChem, ChemElectroChem, Chem Comm, Energy Storage Materials, The Journal of Physical Chemistry Letters, Journal of Physical Chemistry C, ACS Applied Materials & Interfaces, Nanoscale, ACS Applied Energy Materials, ACS Applied Nano Materials, Materials Horizons, New Journal of Chemistry, Ceramic International, Electrochimica Acta, Journal of Electrochemical Society, RSC Advances, Materials Today Energy, Journal of Energy Storage,* etc.
- Reviewer Panel Member, RSC Advances
- Review Editor, Frontiers in Energy Research

Reviewer for Funding Agencies

- Proposal Reviewer for ACS Petroleum Research Fund
- Proposal Reviewer for Ralph E Powe Junior Faculty Award
- Proposal Reviewer for National Science Center, Poland
- Proposal Reviewer for the Accelerate Research Proposal, Mitacs, Canada
- Proposal Reviewer for the Elevate Research Proposal, Mitacs, Canada

Book Editor

- "Nanostructured Materials for Sustainable Energy: Design, Evaluation and applications" American Chemical Society Books, to be published 2022.
-

E. Research Supervision and Selected Student Awards

Current group member

Graduate Students (8)

1. Siyuan Gao (PhD student, 2018-current)
- The Honorary Mentioning, Division of Energy and Fuels, American Chemical Society, Spring 2022 National Meeting in San Diego, CA.
- Dissertation Completion Fellowship (2022-2023), Northern Illinois University
- Jon Carnahan Chemistry Scholarship (2018), Northern Illinois University
- Visiting student researcher at Argonne National Laboratory (2019-current)

2. Bomin Li (PhD student, 2019-current)
- The Second Prize Winner, Division of Energy and Fuels, American Chemical Society, Fall 2022 National Meeting in Chicago, IL
- John D. Graham Scholarship (2022), Northern Illinois University
- Jon Carnahan Chemistry Scholarship (2018), Northern Illinois University
- Visiting student researcher at Argonne National Laboratory (2019-current)

3. Jacob Kaelin (PhD student, 2019-current)
- John and Lili La Tourette Student Research Award (2019), Northern Illinois University
- Visiting student researcher at Argonne National Laboratory (2020-current)

4. Olusola Dahunsi (PhD student, 2019-current)
- Internship at Argonne National Laboratory

5. Fan Xia (PhD student, 2020-current)
- The Second Prize Winner, Division of Energy and Fuels, American Chemical Society, Spring 2022 National Meeting in San Diego, CA.
- Visiting student researcher at Argonne National Laboratory (2022-current)

6. Bowen An (PhD student, 2022-current)
7. Dhilip Kanna Ashok Kumar (MS student, 2022-current)
8. Iddrisu Abdul Razak (PhD student, joint with NIU physics, 2021-current)

Undergraduate student (2)

1. Stephen Harcar (2022-present)
2. Brenda Storms (2022- present)

<u>Group Alumni</u>

Postdoc (1)

1. Ke Lu (2018-2020, currently Professor at Anhui University, China)

Graduate Student (2)

1. Sarat Alabidun (M.S. 2019-2021, currently PhD student at Imperial College London, UK)
- Outstanding Graduate Student Award (2021), Northern Illinois University
- Internship at Tesla (2019)

2. Elijah Openiyi (graduate student, 2020-2021, currently PhD student at Purdue University)

<u>Visiting graduate students (2)</u>

1. Zhida Wang (2018-2020, earned his PhD from Harbin Institute of Technology in 2021)
2. Hong Zhang (2020-2021, earned her PhD from Shanghai Jiao Tong University in 2021, currently postdoc at University of Science and Technology, China)
3.

<u>Undergraduate Students (8</u><u>, 4 co-authored in 5 of Cheng's independent publications)</u>

1. Peter Johnson (2020-2021);

2. Ziyi Liang (currently graduate student at Univ. Illinois at Chicago);
3. Jose Flores (2019);
4. Karina Villarreal (2019);
5. Jacob Kaelin (2018-2019, 2 publications, currently PhD student at my group);
6. Daniel Coliz (2018-2019, 1 publication);
7. Colten Nickel (2018-2019, 1 publication);
8. Robert Dick (REU 2018 from Trine University, 1 publication, currently PhD student at Univ. of Texas at Austin),

High School students (2, 1 co-authored in 1 of Cheng's independent publications)
1. Zain Sattar (Bartlett High School, 1 publication, currently attending Univ. Illinois at Chicago)
2. Nikunj Tyagi (Metea Valley High School)

Teaching

- 2022 Spring: CHEM 615-2, PAIN Seminar (14 graduate students)
- 2022 Spring: CHEM 498/499H, Undergraduate Research (17 undergraduate students)
- 2022 Spring: CHEM 210, General Chemistry (118 undergraduate students)
- 2021 Fall: CHEM 210, General Chemistry (57 undergraduate students, 4.09/5.00)
- 2021 Fall: CHEM 498/499H, Undergraduate Research (17 undergraduate students)
- 2021 Spring: CHEM 626, Electroanalytical Chemistry (11 graduate students, 5.00/5.00)
- 2021 Spring: CHEM 498/499H, Undergraduate Research (24 undergraduate students)
- 2021 Spring: CHEM 615-2, PAIN Seminar (14 graduate students)
- 2020 Fall: CHEM 210, General Chemistry (64 undergraduate students, 4.56/5.00)
- 2020 Fall: CHEM 498/499H, Undergraduate Research (25 undergraduate students)
- 2020 Spring: CHEM 425, Analytical Chemistry II (21 undergraduate students, 5.00/5.00)
- 2020 Spring: CHEM 498/499H, Undergraduate Research (33 undergraduate students)
- 2019 Fall: CHEM 210, General Chemistry (71 undergraduate students, 3.96/5.00)
- 2019 Fall: CHEM 615-2, PAIN Seminar (13 graduate students)
- 2019 Spring: CHEM 425/525, Analytical Chemistry II (35 undergraduate students, 4.33/5.00)
- 2019 Spring: CHEM498/499H, Undergraduate Research (42 undergraduate students)
- 2018 Spring: CHEM 626, Electroanalytical Chemistry (13 graduate students, 4.75/5.00)

F. Past and Current Research Sponsors

- Department of Energy, Office of Science, Basic Energy Sciences (sole PI)
- American Chemical Society, Petroleum Research Fund (PI)
- Argonne National Laboratory, Applied Materials Division (6 projects, PI)
- Argonne National Laboratory, Materials Science Division (2 projects, PI)
- Argonne National Laboratory, Chemical Sciences and Engineering Division (3 projects, PI)
- College of Liberal Arts & Sciences, Northern Illinois University

G. Peer Reviewed Publications

Google Scholar: total citation = 8500, H-index = 36, retrieved on 09/13/2022)

Publications from Independent Career (25)

1. Zhang, H.; Song, B.; Zhang, W.; **Cheng, Y.**;* Q. Chen, Lu, K. "Activation of MoS_2 Monolayer Electrocatalysts via Reduction and Phase Control for Selective Hydrogenation of Nitrogen to Ammonia" ***Chemical Science***, 2022, 13, 9498-9506.
2. Zhang, H.; Shang, Z.; Gao, S.; Song, B.*; Zhang, W.; Cao, R.; Jiao, S.; **Cheng, Y.*;** Chen, Q.; Lu, K.* "Redox Catalysis Promoted Fast Iodine Kinetics for Polyiodide-Free Na-I_2 Electrochemistry" ***Journal of Materials Chemistry A***. 2022, 10, 11325-11331.
3. Gao, S.; Li, B.; Tan, H.; Xia, F.; Dahunsi, O.; Xu, W.; Liu, Y.; Wang, R.* and **Cheng, Y.*** "High Energy and Stable Subfreezing Aqueous Zn-MnO_2 Batteries with Selective and Pseudocapacitive Zn-ion insertion in MnO_2" ***Advanced Materials***, 2022, 34, 2201510
4. Dahunsi, O.; Li, B.; Gao, S.; Lu, K.; Xia, F.; Xu, T.; **Cheng, Y.*** "One-Step Synthesis of Na–Sn Alloy with Internal 3D $Na_{15}Sn4$ Support for Fast and Stable Na Metal Batteries" ***ACS Applied Energy Materials***, 2022, 5, 1, 20-26
5. Lu, K.; Xia, F.; Li, B.; Liu, Y.; Abdul Razak I. ; Gao, S.; Kaelin, J.; Brown, D. E.; **Cheng, Y.*** "Synergistic Multisites $Fe_2Mo_6S_8$ Electrocatalysts for Ambient Nitrogen Conversion to Ammonia" ***ACS Nano***, 2021, 15, 16887.
6. Xia, F.; Li, B.; Liu, Y.; Liu, Y.; Gao, S.; Lu, K.; Kaelin, J.; Wang, R.; Marks, T.; **Cheng, Y.*** "Carbon Free and Noble Metal Free $Ni_2Mo_6S_8$ Electrocatalyst for Selective Electrosynthesis of H_2O_2" ***Advanced Functional Materials*** 2021, 2104716.
7. Shang, Z.; Song, B.; Li, H.; Zhang, H.; Feng, F.; Kaelin, J.; Zhang, W.; Xie, B.; **Cheng, Y.**; Lu, K.; Chen, Q. "Atomically Dispersed Manganese Lewis Acid Sites Catalyze Electrohydrogenation of Nitrogen to Ammonia" ***CCS Chemistry***, 2021, 3, 2104-2115.
8. Gao, S.; Li, B.; Lu, K.; Alabidun, S.; Xia, F.; Nickel, C. (NIU undergrad.); Xu, T.*; **Cheng, Y.*** "Modulating MnO_2 Interface with Flexible and Self-Adhering Alkylphosphonic Layers for High-Performance Zn-MnO_2 Batteries" ***ACS Applied Materials & Interfaces*** 2021, 13, 23724-23731.
9. Gao, S.; Xia, F.; Li, B.; Razak, I. B.; Liu, Y.; Lu, K.*; Brown, D. E.; Wang, R.; **Cheng, Y**.* "Synergistics of Fe_3C and Fe on Mesoporous Fe–N–C Sulfur Host for Nearly Complete and Fast Lithium Polysulfide Conversion" ***ACS Applied Materials & Interfaces*** 2021, 13, 17791-17799.
10. Wang, Z.; Lu, K.; Xia, F.; Dahunsi, O.; Gao, S.; Li, B.; Wang, R.; Lu, S.; Qin, W.; **Cheng, Y.;** Wu, X. "Sodiated SnSb nanoparticles embedded in N-doped graphene sponges direct uniform Na nucleation and smooth plating for high efficiency Na metal batteries" ***Journal of Materials Chemistry A***. 2021, 9, 6123-6130.
11. Xie, X.; He, C.; Li, B.; He, Y.; Cullen, D.; Wegener, E.; Kropf, A.; Martinez, U.; **Cheng, Y.;** Engelhard, M.; Bowden, M.; Song, M.; Lemmon, T.; Li, X.; Nie, Z.; Liu, J.; Myers, D.; Zelenay, P.; Wang, G.; Wu, G.; Ramani, V.; Shao, Y.; "Performance enhancement and degradation mechanism identification of a single atom Co-N-C catalyst for proton exchange membrane fuel cells" ***Nature Catalysis***, 2020, 3, 1044
12. Zhang, H.; Lu, K.; Li, B.; Liu, Y.; Su, Y.*; Wang, R.; **Cheng, Y.*** "Microfludic, one-batch synthesis of Pd nanocrystal on N-doped carbon in surfactant free deep eutectic solvents for formic acid electrochemical oxidation" ***ACS Applied Materials & Interfaces***, 2020, 12, 42704-42710
13. Lu, K.; Li, B.; Zhan, X.; Xia, F.; Dahunsi, O.; Gao, S.; Reed, D.; Sprenkle, V.; Li, G.*; **Cheng, Y.*** "Elastic Na_xMoS_2-carbon-BASE triple interface direct robust solid-solid interface for all-solid-state Na-S batteries" ***Nano Letters***, 2020, 20, 6837-6844
14. Lu, K.; Liu, Y.; Lin, F.; Cordova, I.; Gao, S.; Li, B.; Peng, B.; Xu, H.; Kaelin, J.; Coliz, D. (NIU undergrad.); Wang, C.; Shao, Y.; **Cheng, Y.*** "Li_xNiO/Ni Heterostructure with Strong Basic Lattice Oxygen Enables Electrocatalytic Hydrogen Evolution with Pt-like Activity" ***Journal of the American Chemical Society***, 2020, 142, 29, 12613-12619.

15. Lu, K.; Xu, H.; He, H.; Gao, S.; Li, X.; Zheng, C.; Xu, T.*; **Cheng, Y.*** "Modulating reactivity and stability of metallic Lithium via atomic doping" ***Journal of Materials Chemistry A*** 2020, 8, 10363-10369
16. Lu, K.; Liu, Y.; Chen, J.; Zhang, Z.; **Cheng, Y.*** "Redox Catalytic and Quasi-solid Sulfur Conversion for High Capacity lean Lithium Sulfur Batteries" ***ACS Nano***, 2019, 13, 12, 14540-14548
17. Lu, K.; Gao, S.; Li, G.; Kaelin, J. (NIU undergrad.); Zhang, Z.; **Cheng, Y.***" Regulating Interfacial Na-ion Flux via Artificial Layers with Fast Ionic Conductivity for Stable and High-rate Na Metal Batteries" ***ACS Materials Letters***, 2019, 1, 3, 303-309
18. Jia, X.; Wu, J.; Lu, K.; Li, Y.; Qiao, X.; Kaelin, J. (NIU undergrad.); Lu, S.*; **Cheng, Y.***.;Wu, X and Qin, W.* "Organic-Inorganic Hybrids of Fe-Co Polyphenolic Networks Wrapped Fe_3O_4 Nanocatalysts for Significantly Enhanced Oxygen Evolution" ***Journal of Materials Chemistry A***, 2019, 7, 14302
19. Li, P.; Li, Y.; Zhang, X.; Chen, J.; **Cheng, Y.;** Li, Y.; Ma, Y. and Liu, J. "Diameter dependent doping in horizontally aligned high-density N-doped SWNT arrays" ***Nano Research***, 2019, 12, 1845.
20. Lu, S.*; Wang, Z.; Yan, H.; Wang, R.; Lu, K.; **Cheng, Y.***;Qin, W.; and Wu, X.* "High rate and cycling stable Li metal anodes enabled with aluminum-zinc oxides modified copper foam" ***Journal of Energy Chemistry***, 2020, 41, 87-92
21. Wang, Z.; Lu, S.*; Lu, K.; Li, Y.; Wang, R.; **Cheng, Y.***;Qin, W.; and Wu, X.* "Stable high capacity cycling of Li metal via directed and confined Li growth with robust composite sponge" ***Journal of Power Sources***, 2019, 428, 1-7.
22. Gong, J.; Li, X.; Guo, P.; Zhang, L.; Huang, W.; Lu, K.; **Cheng, Y.;** Schaller, R.D.; Marks, T. and Xu, T.* "Energy-Distinguishable Bipolar UV Photoelectron Injection from LiCl-Promoted $FAPbCl_3$ Perovskite Nanorods" ***Journal of Materials Chemistry A***, 2019, 7, 13043-13049.
23. Lu, K.; Gao, S.; Dick, J.R. (REU undergrad.); Satter, Z.; and **Cheng, Y.*** "A fast and stable Li metal anode incorporating an Mo_6S_8 artificial interphase with super Li-ion conductivity" ***Journal of Materials Chemistry A***, 2019, 7, 6038-6044.
24. Lu, K.; Zhang, H.; Gao, S.; Ma, H.*; Chen, J. and **Cheng, Y.*** "Manipulating Polysulfide Conversion with Strongly Coupled Fe_3O_4 and Nitrogen Doped Carbon for Stable and High Capacity Lithium-Sulfur Batteries" ***Advanced Functional Materials***, 2018, 1807309.
25. Lu, K.; Zhang, H.; Gao, S.; **Cheng, Y.;*** and Ma, H.* "High Rate and Stable Symmetric Potassium ion Batteries Fabricated with Flexible Electrodes and Solid-state Electrolytes" ***Nanoscale***, 2018, 10, 20754.

Postdoctoral and Graduate Publications (46)

26. **Cheng, Y.**; Tao, J.; Zhu, G.; Soltis, J. A.; Legg, B.; Nakouzi, E.; De Yoreo, J.; Sushko, M.; and Liu, J. "Near Surface Nucleation and Particle Mediated Growth of Colloidal Au Nanocrystals" ***Nanoscale***, 2018, 10, 11907.
27. Li, Y.;$^+$ An, Q.;$^+$ **Cheng, Y.**;$^+$ Liang, Y.; Ren, Y.; Sun, C.; Dong, H.; Tang, Z.; Li, G. and Yao, Y. "A High-Voltage Rechargeable Magnesium-Sodium Hybrid Battery" ***Nano Energy***, 2017, 34, 188
28. Li, W.; Nie, L.; **Cheng, Y.**; Kovarik, L.; Liu, J. and Wang, Y. "Surface enrichment of Pt in stable Pt-Ir nano-alloy particles on $MgAl_2O_4$ spinel in oxidizing atmosphere" ***Catalysis Communications***, 2017, 93, 57
29. Li, W.; Kovarik, L.; **Cheng, Y.**; Nie, L.; Bowden, M.; Liu, J.; Wang, Y. "Stabilization and Transformation of Pt Nanocrystals Supported on $ZnAl_2O_4$ Spinel" ***RSC Advances***, 2017, 7, 3282.
30. **Cheng, Y.**; Chang, H. J.; Dong, H.; Choi, D.; Sprenkle, V.; Liu, J.; Yao, Y.; and Li, G. "Rechargeable Mg-Li Batteries: Status and Challenges" ***Journal of Materials Research***, 2016, 31, 3125-3141.
31. **Cheng, Y.**; Luo, L.; Zhong, L.; Chen, J. Li, B.; Wang, W.; Mao, S.; Wang, C.; Sprenkle, V.; Li, G. and Liu, J. "Highly Reversible Zinc-ion Intercalation into Chevrel Phase Mo_6S_8 Nanocubes and Applications for Advanced Zinc ion Batteries", ***ACS Applied Materials & Interfaces***, 2016, 8, 13673-13677.

32. Duan, B.; Yang, J.; Salvador, J. R.; He, Y.; Zhao, B.; Wang, S.; Wei, P.; Ohuchi, F. S.; Zhang, W.; Hermann, R. P.; Gourdon, O.; Mao, S.; **Cheng, Y.**; Wang, C.; Liu, J.; Zhai, P.; Tang, X.; Zhang, Q. and Yang, J. "Electronegative Guests in $CoSb_3$" ***Energy & Environmental Science***, 2016, 9, 2090-2098.
33. **Cheng, Y.**; Choi, D.; Han, K.; Mueller, K.; Zhang, J.; Sprenkle, V.; Liu, J. and Li, G. "Toward the Design of High Voltage Hybrid Magnesium-Lithium Batteries" ***Chemical Communications***, 2016, 52, 5379-5382.
34. **Cheng, Y.**; Shao, Y.; Ruju, V.; Ji, X.; Mehdi, L.; Han, K.; Engelhard, M.; Li, G.; Browning, N.; Mueller, K. and Liu, J. "Molecular Storage of Mg ions with Vanadium Oxide Nanoclusters" ***Advanced Functional Materials***, 2016, 26, 3446-3453
35. Pan, H.; Shao, Y.; Yan, P.; **Cheng, Y.**; Han, K.; Nie, Z.; Wang, C.; Yang, J.; Li, X.; Bhattacharya, P.; Mueller, K. and Liu, J. "Highly Reversible Aqueous Zn/MnO_2 Energy Storage Systems from Chemical Conversion Reactions" ***Nature Energy***, 2016, 1, 16039.
36. Shao, Y.; **Cheng, Y.**; Duan, W; Wang, W.; Lin, Y.; Wang, Y. and Liu, J. "Nanostructured Electrocatalysts for PEM Fuel Cells and Redox Flow Batteries: a Selected Review" ***ACS Catalysis***, 2015, 5, 7288-7298.
37. **Cheng, Y.**; Shao, Y.; Parent, L.; Sushko, M.; Li, G.; Sushko, P.; Browning, N.; Wang, C. and Liu, J. " Interface Promoted Reversible Mg Insertion in Nanostructured Tin-Antimony Alloys" ***Advanced Materials***, 2015, 27, 6598-6605.
38. **Cheng, Y.**; Stolley, R.; Han, K. S.; Shao, Y.; Arey, B.; Washton, N.; Mueller, K. T.; Helm, M.; Sprenkle, V.; Liu, J. and Li, G. "Highly Active Electrolytes for Rechargeable Mg batteries Based on $[Mg_2(\mu\text{-}Cl)_2]^{2+}$ Cation Complex in Dimethoxyethane" ***Physical Chemistry Chemical Physics***, 2015, 17, 13307-13314.
39. Parent, L.; **Cheng, Y.**; Sushko, P.; Shao, Y.; Liu, J.; Wang, C. and Browning, N. " Realizing the Full Potential of Insertion Anodes for Mg-ion Batteries Through the Nano-Structuring of Sn" ***Nano Letters***, 2015, 15, 1177-1182.
40. **Cheng, Y.;** Parent, L.; Shao, Y.; Wang, C.; Sprenkle, V.; Li, G. and Liu, J. "Facile Synthesis of Chevrel Phase Nanocubes and Their Applications for Multivalent Energy Storage" ***Chemistry of Materials***, 2014, 26, 4904-4907.
41. **Cheng, Y.**; Shao, Y.; Zhang, J.; Sprenkle, V.; Liu, J. and Li, G. "High Performance Batteries based on Hybrid Magnesium and Lithium Chemistry" ***Chemical Communications***, 2014, 50, 9644-9646.
42. **Cheng, Y.**; Liu, T.; Shao, Y.; Engelhard, M.; Liu, J. and Li, G. "Electrochemically Stable Cathode Current Collectors for Rechargeable Magnesium Batteries" ***Journal of Materials Chemistry A***, 2014, 2, 2473-2477.
43. Shao, Y.; Gu, M.; Li, X.; Nie, Z.; Zuo, P.; Li, G.; Liu, T.; Xiao, J.; **Cheng, Y.**; Wang, C.; Zhang, J. and Liu, J. "Highly Reversible Mg Insertion in Nanostructured Bi for Mg Ion Batteries" ***Nano Letters***, 2014, 14, 255-260
44. Zhang, T.; Kim, C.; **Cheng, Y.**; Ma, Y.; Zhang, H. and Liu, J. "Making Commercial Carbon Fiber Cloth Having Comparable Capacitances to Carbon Nanotubes and Graphene in Supercapacitors through a "Top-Down" Approach" ***Nanoscale***, 2015, 7, 3285.
45. Lee, G**.; Cheng, Y.**; Varanasi, C. and Liu, J. "Influence of the Nickel Oxide Nanostructure Morphology on the Effectiveness of Reduced Graphene Oxide Coating in Supercapacitor Electrodes" ***Journal of Physical Chemistry C.*** 2014, 118, 2281-2286
46. Wang, A.; **Cheng, Y.**; Zhang, H.; Hou, Y.; Wang, Y. and Liu, J. "Effect of Multi-Walled Carbon Nanotubes and Conducting Polymer on Capacitance of Mesoporous Carbon Electrodes" ***Journal of Nanoscience and Nanotechnology*** 2014, 14, 7015-7021.
47. **Cheng, Y.;** Zhang, H.; Varanasi, C. and Liu, J. "Highly Efficient Oxygen Reduction Electrocatalysts based on Winged Carbon Nanotubes" ***Scientific Reports***, 2013, 3, 3195.
48. **Cheng, Y.** and Liu, J. "Carbon Nanomaterials for Flexible Energy Storage" ***Material Research Letters,*** 2013, 1, 175-192.

49. **Cheng, Y.;** Zhang, H.; Varanasi, C. and Liu, J. "Improving the Performance of Cobalt-Nickel Hydroxide-based Self-Supporting Electrodes for Supercapacitors Using Accumulative Approaches" ***Energy & Environmental Science,*** 2013, 6, 3314-3321.
50. **Cheng, Y.**; Zhang, H.; Lu, S.; Varanasi, C. and Liu, J. "Flexible Asymmetric Supercapacitors with High Energy and High Power Density in Aqueous Electrolytes" ***Nanoscale***, 2013, 5, 1067-1973.
51. Lu, S.; **Cheng, Y.;** Wu, X. and Liu, J. "Significantly Improved Long-cycle Stability in High rate Li-S Batteries Enabled by Coaxial Graphene-Wrapping over Sulfur-Coated Carbon Nanofibers" ***Nano Letters,*** 2013**,** 13(6), 2485-2489.
52. Aruguete, D.; Kim, B.; Hochella, M.; Ma, Y.; **Cheng, Y.;** Hoegh, A.; Liu, J. and Pruden A. "Antimicrobial nanotechnology: its potential for the effective management of microbial drug resistance and implications for research needs in microbial nanotoxicology" ***Environ. Sci.: Processes Impacts***, 2013, 15, 93-102.
53. Sun, X.; Wang, Z.; Zhai, S.; **Cheng, Y.**; Liu, J. and Liu, B. "In Vitro Cytotoxicity of Silver Nanoparticles in Primary Rat Hepatic Stellate Cells" ***Molecular Medicine Reports*** 2013, 8, 1365-1372.
54. Li, B.; **Cheng, Y.;** Liu, J.; Yi, C.; Brown, A.; Yuan, H.; Vo-Dinh, T.; Fisher, M. and Warren, W. "Quantitative Nonlinear Optical Imaging of Graphene Using Shaped Femtosecond Laser Pulses" ***Nano Letters,*** 2012, 12(11), 5936-5940.
55. Lin, S.; Huang, R.; **Cheng, Y.;** Liu, J.; Lau, B. and Wiesner, M. "Silver Nanoparticle-Alginate Composite Beads for Point-of-Use Drinking Water Disinfection" ***Water Research***, 2013, 12, 3959-3965.
56. **Cheng, Y**.; Lu, S.; Zhang, H.; Varanasi, C. and Liu, J. "Synergistic Effects from Graphene and Carbon Nanotubes Enable Flexible and Robust Electrodes for High-Performance Supercapacitors" ***Nano Letters,*** 2012, 12(8), 4206-4211.
57. Yang, S.; Cai, Y.; **Cheng, Y.**; Varanasi, C. and Liu, J. "Monolithic co-Aerogels of Carbon/Titanium Dioxide as Three Dimensional Nanostructured Electrodes for Energy Storage" ***Journal of Power Sources***, 2012, 218, 140-147.
58. **Cheng, Y.;** Zhang, H.; Cordova, I. and Liu, J. "Comparing Graphene and Carbon Nanotubes as Nanoscale Current Collectors in MnO_2-based Supercapacitors" ***Journal of Nano Energy and Power Research*** 2013, 2(1), 41-47.
59. Lin, S.; **Cheng, Y.**, Liu, J. and Wiesner, M. "Polymeric Coatings on Silver Nanoparticles Hinder Autoaggregation but Enhance Attachment to Uncoated Surfaces" ***Langmuir,*** 2012,28(9), 4178-4186.
60. Cho, J.; Lin, Q.; Yang, S.; Simmons, J.; **Cheng, Y.**; Lin, E.; Yang, J.; Foreman, J.; Everitt, H.; Yang, W.; Kim, J. and Liu, J "Sulfur-doped Zinc Oxide Nanostars: Synthesis and Simulation of Growth Mechanism" ***Nano Research***, 2012, 5(1), 20-26.
61. Ma, R.; Levard, C.; Marinakos, S.; **Cheng, Y.**; Liu, J.; Michel, F.; Brown, G. and Lowry, G. "Size-Controlled Dissolution of Organic-Coated Silver Nanoparticles" ***Environmental Science and Technology*** 2012, 46 (2), 752–759.
62. Lin, S.; **Cheng, Y.;** Bobcombe, Y.; Jones, K.; Liu, J. and Wiesner, M. "Deposition of Silver Nanoparticles in Geochemically Heterogeneous Porous Media: predicting affinity from surface composition analysis" ***Environmental Science and Technology*** **2011,** 45(12), 5209-5215.
63. **Cheng, Y.;** Yin, L.; Lin, S.; Wiesner, M.; Bernhardt, E. and Liu, J. "Toxicity Reduction of Polymer-Stabilized Silver Nanoparticles Suspensions by Sunlight" ***Journal of Physical Chemistry C*** 2011, 115, 4425-4432.
64. Yin, L.; **Cheng, Y.**; Espinasse, B.; Colman, B.; Auffan, M.; Wiesner, M.; Rose, J.; Liu, J. and Bernhardt, E. "More Than the ions: The Effects of Silver Nanoparticles on Lolium Multiflorum" ***Environmental Science and Technology*** 2011, 45, 2360-2367.
65. Hou, Y.; **Cheng, Y.;** Hobson, T. and Liu, J. "Design and Synthesis of Hierarchical MnO_2 Nanospheres/carbon nanotubes/conducting Polymer Ternary Composite for High Performance Electrochemical Electrodes" ***Nano Letters,*** 2010, 10, 2727-2733.

66. Feng, Y.; Ju, X.; Feng, W.; Zhang, H.; **Cheng, Y.;** Liu, J.; Fujii, A.; Ozaki, M. and Yoshiho, K. "Organic Solar Cells Using Few-walled Carbon Nanotubes Electrode Controlled by the Balance Between Sheet Resistance and the Transparency" ***Applied Physics Letters*** 2009, 94,123302.
67. Liu, X.; Cui, C.; **Cheng, Y.**; Ma, H. and Liu, D. "Shape Control During Electrochemical Synthesis of Gold Nanoparticles" ***International Journal of Minerals, Metallurgy, and Materials***, 2013, 20, 486-492.
68. Liu, A.; **Cheng, Y.**; Tian, F.; Pan, W.; Huang, S.; Feng, X. and Ma, H. "A Facile Route to Synthesize Gold Prisms Up to Micrometer Scale Based on Slow Reduction Methods" ***Journal of Dispersion Science and Technology***, 2011, 32, 277-282.
69. **Cheng, Y.**; Qiu, C.; Ma, H.; Zhang, X. and Gu, X. "Unusual Corrosion Process of Gold Nanoplates and the Mechanism Study" ***Nanoscale*** 2010, 2, 685-688.
70. Zhang, J.; Li, W.; **Cheng, Y.;** Zhang, X.; Huang, S. and Ma, H. "A Direct and Facile Synthetic Route for Micron-scale Gold Prisms and Fabrication of Gold prism Thin films on Solid Substrates" ***Materials Chemistry and Physics*** 2010, 119, 188–194.
71. Feng, X.; Ma, H.; Huang, S.; Pan, W.; Zhang, X.; Tian, F.; Xu, C.; **Cheng, Y**. and Luo, J. "Aqueous-Organic Phase-Transfer of Highly Stable Gold, Silver and Platinum Nanoparticles and New Route for Fabrication of Gold Nanofilms at the Oil/Water Interface and on Solid Supports" ***Journal of Physical Chemistry B*** 2006, 110*,* 12311-12317.

Book Chapter

1. **Cheng, Y.** and Liu, J. et al. One-pot synthesis of functionalized few-walled carbon nanotubes/MnO_2 composite for high performance electrochemical supercapacitors, ***Materials Challenges in Alternative and Renewable Energy II: Ceramic Transaction***

Patent and Patent Application from Independent Career (3)

1. **Cheng, Y.** ; Xu, T.; Lu, K.; Xu, H. "Doped lithium anode, battery having a doped lithium anode, and methods of using thereof" US Patent Application 16/386,162.
2. **Cheng, Y.**; Xu, T. "Doped sodium anode anode, battery having a doped sodium anode, and methods of using thereof" US Patent Application 63/109,243.
3. **Cheng, Y.** ; Lu, K. "Electrochemical Production of Ammonia and Catalyst Therefor" US Patent Application filed.

<u>Invited Seminar Presentations</u>

1. **Cheng, Y,** "Modulating electrochemical interfaces for electrocatalysis and batteries" Department of Chemistry, University of Iowa, October 2021

<u>Presentations at national and international conferences</u>

1. **Cheng, Y.**, Lu, K. and Xia, F. "metal modified Chevrel phase chalcogenide Mo_6S_8 for electrocatalysis" Spring 2021 ACS National Meeting (invited oral presentation)
2. **Cheng, Y.**, Lu, K. and Xia, F. "metal modified Chevrel phase chalcogenide Mo_6S_8 for electrocatalysis" Fall 2021 ACS National Meeting in Atlanta, GA (invited oral presentation)
3. **Cheng, Y.** and Lu, K." catalyzing polysulfide conversion for advanced lithium sulfur batteries" Fall 2020 ACS National Meeting " Fall 2020 ACS National Meeting in San Francisco, CA (Invited Oral Presentation)
4. Xu, T. and **Cheng, Y.** "Electronegativity-guided Atomic Doping for Air-Stable and Dendrite free Lithium metal anode" Fall 2020 MRS Meeting (oral presentation).

5. **Cheng, Y.** and Lu, K. “Manipulating active sites using molten salts for synthesizing highly efficient electrocatalysts” Fall 2019 ACS National Meeting in San Diego, CA (invited oral presentation)
6. **Cheng, Y.** and Lu, K. "Molten salt mediated synthesis of highly active oxygen reduction electrocatalysts in acids" Spring 2019 ACS National Meeting in Orlando, FL (invited oral presentation)
7. **Cheng, Y.** and Lu, K. "Manipulating active sites using molten salts for synthesizing highly efficient electrocatalysts" Fall 2019 ACS National Meeting in San Diego, CA (Invited Oral Presentation)
8. **Cheng,** Y. and Liu, J. “Advances in Mg and Zn Battery Systems” 2016 MRS Spring Meeting, Phoenix, AZ (Oral Presentation)
9. **Cheng, Y.** and Liu, J. “Fundamental Study of the Nucleation Phenomena in Energy Processes and Materials” 2016 MRS Spring Meeting, Phoenix, AZ (Oral Presentation)
10. **Cheng, Y**. and Liu, J. “Assembly of Hybrid Nanomaterials for Energy Storage and Conversion” 2015 ACS Spring Meeting, Denver, CO (Oral Presentation)
11. **Cheng, Y**.; Shao, Y.; Li, G. and Liu, J. “Nanostructured Materials for Rechargeable Mg Batteries” 2015 ACS Spring Meeting, Denver, CO (Oral Presentation)
12. **Cheng, Y**.; Zhang, H.; Varanasi, C. and Liu, J. “Design and Assembly of Hybrid Nanomaterial Systems for Flexible Energy Storage” 2013 MRS Spring Meeting (Poster Presentation)
13. **Cheng, Y.** and Liu, J. “High Performance Supercapacitors Using MnO_2 and Carbon Nanomaterials” CEINT Internal Meeting. Durham, NC Mar. 2012 (Oral Presentation)
14. **Cheng, Y.** and Liu, J. “Graphene oxide: synthesis, characterization and applications” International Conference on the Environmental Implications of NanoTechnology & EPA Nano Grantees Meetings, Durham, NC, USA May 2011 (Poster Presentation)
15. **Cheng, Y.** and Liu, J. “Toxicity Reduction of Polymer stabilized silver nanoparticles by sunlight” CEINT Internal Scientific Meeting, Durham, NC Apr. 2010 (Poster Presentation)
16. **Cheng, Y.** and Liu, J. “Stability of silver nanoparticles under the irradiation of sunlight.” International Conference on the Environmental Implications of NanoTechnology, Washington, DC Sep. 2009 (Oral Presentation)
17. **Cheng, Y.** and Liu, J. “Stability of silver nanoparticles under the irradiation of sunlight” CEINT Brown Bag Lunch Seminar, Duke University, Durham, NC Sep. 2009 (Oral Presentation)