

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
<http://yingweng.org>

Academic Appointment

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

Education and Training

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

Selected Awards

1. Outstanding performance award, PNNL (2013)
2. Nanoscience program fellowship, Duke University (2009, 2010)
3. Distinguished graduate honor of Shandong Province, China (2008)
4. National scholarship of China (2007)
5. Excellent student award of Shandong Province (2005)
6. First-class, excellent student scholarship of Shandong University (2004, 2006, 2007)
7. Second-class, excellent student scholarship of Shandong University (2005)

Professional Affiliations and Services

- Leading symposium organizer for “Sustainable Energy and Water via Innovative Electrocatalysis, Photocatalysis and Hybrid Catalysis” at 258th American Chemical Society National Meeting, San Diego, CA 2019
- Leading symposium organizer for “Sustainable Energy Conversion via Innovative Electrocatalysis and Photocatalysis” at 257th American Chemical Society National Meeting, Orlando, FL 2019
- Reviewer for scholar journals: Advanced Materials, CHEM, Advanced Energy Materials, ACS Nano, Nano Energy, Energy & Environmental Sciences, NPG Asia Materials, Scientific Reports, Dalton Transactions, ChemSusChem, The Journal of Physical Chemistry Letters, Journal of

Physical Chemistry C, ACS Applied Materials & Interfaces, Nanoscale, New Journal of Chemistry, etc.

- Reviewer Panel Member, RSC Advances
- Review Editor, Frontiers in Energy Research
- Member: American Chemistry Society, Material Research Society.
- Section Chair, 2015 ACS spring meeting, Denver, CO.

Courses Taught

- CHEM 626, Electroanalytical Chemistry, ~ 10 graduate students
- CHEM 425/525, Analytical Chemistry II, ~ 40 enrollment
- CHEM 498/499H, Undergraduate research, ~ 40 enrollment

Research Supervision

- Postdoc: Dr. Ke Lu
- Ph.D. student: Siyuan Gao, Olusola Dahunsi,
- M.S. student: Sarat Alabidun
- Visiting student: Zhida Wang
- Undergraduate student (5): Karina Villarreal, Jacob Kaelin, Daniel Coliz, Colten Nickel, Robert Dick (REU, Trine University)
- High School student: Zain Sattar (Bartlett High School)

Peer Reviewed Publications

1. 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*, 2019, In Press
2. 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.
3. 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 FAPbCl₃ Perovskite Nanorods" *Journal of Materials Chemistry A*, 2019, In Press
4. Lu, K.; Gao, S.; Dick, J.R.; Satter, Z.; and **Cheng, Y.*** "A fast and stable Li metal anode incorporating an Mo₆S₈ artificial interphase with super Li-ion conductivity" *Journal of Materials Chemistry A*, 2019, 7, 6038-6044.
5. Lu, K.; Zhang, H.; Gao, S.; Ma, H.*; Chen, J. and **Cheng, Y.*** "Manipulating Polysulfide Conversion with Strongly Coupled Fe₃O₄ and Nitrogen Doped Carbon for Stable and High Capacity Lithium-Sulfur Batteries" *Advanced Functional Materials*, 2018, 1807309.
6. 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.
7. **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.

Prior to NIU

8. 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

9. 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 MgAl₂O₄ spinel in oxidizing atmosphere" *Catalysis Communications*, 2017, 93, 57
10. Li, W.; Kovarik, L.; **Cheng, Y.**; Nie, L.; Bowden, M.; Liu, J.; Wang, Y. "Stabilization and Transformation of Pt Nanocrystals Supported on ZnAl₂O₄ Spinel" *RSC Advances*, 2017, 7, 3282.
11. **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.
12. **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 Mo₆S₈ Nanocubes and Applications for Advanced Zinc ion Batteries", *ACS Applied Materials & Interfaces*, 2016, 8, 13673-13677.
13. 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 CoSb₃" *Energy & Environmental Science*, 2016, 9, 2090-2098.
14. **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.
15. **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
16. 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/MnO₂ Energy Storage Systems from Chemical Conversion Reactions" *Nature Energy*, 2016, 1, 16039.
17. 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.
18. **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.
19. **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 [Mg₂(μ-Cl)₂]²⁺ Cation Complex in Dimethoxyethane" *Physical Chemistry Chemical Physics*, 2015, 17, 13307-13314.
20. 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.
21. **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.
22. **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.
23. **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.
24. 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
25. 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.

26. 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
27. 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.
28. **Cheng, Y.**; Zhang, H.; Varanasi, C. and Liu, J. "Highly Efficient Oxygen Reduction Electrocatalysts based on Winged Carbon Nanotubes" *Scientific Reports*, 2013, 3, 3195.
29. **Cheng, Y.** and Liu, J. "Carbon Nanomaterials for Flexible Energy Storage" *Material Research Letters*, 2013, 1, 175-192.
30. **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.
31. **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.
32. 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.
33. 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.
34. 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.
35. 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.
36. 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.
37. **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.
38. 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.
39. **Cheng, Y.**; Zhang, H.; Cordova, I. and Liu, J. "Comparing Graphene and Carbon Nanotubes as Nanoscale Current Collectors in MnO₂-based Supercapacitors" *Journal of Nano Energy and Power Research* 2013, 2(1), 41-47.
40. 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.
41. 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.

42. 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.
43. 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.
44. **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.
45. 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.
46. Hou, Y.; **Cheng, Y.**; Hobson, T. and Liu, J. "Design and Synthesis of Hierarchical MnO₂ Nanospheres/carbon nanotubes/conducting Polymer Ternary Composite for High Performance Electrochemical Electrodes" *Nano Letters*, 2010, 10, 2727-2733.
47. 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.
48. 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.
49. 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.
50. **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.
51. 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.
52. 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/MnO₂ composite for high performance electrochemical supercapacitors, *Materials Challenges in Alternative and Renewable Energy II: Ceramic Transaction*

Presentations

1. **Cheng, Y.** and Liu, J. "Advances in Mg and Zn Battery Systems" 2016 MRS Spring Meeting, Phoenix, AZ (Oral Presentation)
2. **Cheng, Y.** and Liu, J. "Fundamental Study of the Nucleation Phenomena in Energy Processes and Materials" 2016 MRS Spring Meeting, Phoenix, AZ (Oral Presentation)

3. **Cheng, Y.** and Liu, J. "Assembly of Hybrid Nanomaterials for Energy Storage and Conversion" 2015 ACS Spring Meeting, Denver, CO (Oral Presentation)
4. **Cheng, Y.**; Shao, Y.; Li, G. and Liu, J. "Nanostructured Materials for Rechargeable Mg Batteries" 2015 ACS Spring Meeting, Denver, CO (Oral Presentation)
5. **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)
6. **Cheng, Y.** and Liu, J. "High Performance Supercapacitors Using MnO₂ and Carbon Nanomaterials" CEINT Internal Meeting, Durham, NC Mar. 2012 (Oral Presentation)
7. **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)
8. **Cheng, Y.** and Liu, J. "Toxicity Reduction of Polymer stabilized silver nanoparticles by sunlight" CEINT Internal Scientific Meeting, Durham, NC Apr. 2010 (Poster Presentation)
9. **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)
10. **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)