

## Ling Zang, PhD

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### Education:

1991 B.S. Department of Chemistry, Tsinghua University, Beijing, China.  
1995 Ph.D. Chinese Academy of Sciences, Beijing, China.

### Professional Experience:

2014.1 – present, Professor, Dept of Mater Sci and Eng, University of Utah.  
2012.7 – 2021.6, Adjunct faculty, Department of Chemistry, University of Utah.  
2008.8 – present, USTAR faculty, Nano Institute of Utah, University of Utah.  
2019.1 – present, Adjunct Professor, Shaanxi University of Science and Technology, China  
2019.5 – 2022.5, Adjunct Professor, China University of Mining and Technology, China  
2008.8 – 2013.12, Associate Professor (tenure), Dept of Mater Sci and Eng, University of Utah.  
2008.7 – 2008.8, Associate Professor (tenure), Southern Illinois University.  
2003.8 – 2008.6, Assistant Professor, Southern Illinois University.  
2001.4 – 2003.7, Postdoc Research Fellow/Senior Scientist, Columbia University.  
1998.4 – 2001.3, Postdoc Research Fellow, Bowling Green State University.  
1996.7 – 1998.3, Alexander von Humboldt Fellow, Erlangen-Nuremberg University, Germany.  
2022 – present, Co-Founder, Novus Analytical Technologies Inc.  
2021– present, Board of Directors, Gentex Corporation  
2011 – present, Founder, CSO, Vaporsens Inc.  
2010 – present, Director, Utah Center for Interfacial Sciences, Nano Institute of Utah

### Research Interests:

Molecular Self-assembly, Organic Nanowires and Nanodevices, Metal-Organic Framework, Surface Nanopatterning, Nanojunction Charge Transfer, Nanoscale Imaging, Single-Molecule Spectroscopy, Single-Molecule Sensing and Probing, Fluorescence Sensing, Optoelectronic Sensing, Explosives Detection, Organic Photovoltaics & Solar Cells

### Honors and Awards:

2021 Fellow, American Association for the Advancement of Science (AAAS)  
2020 Fellow, National Academy of Inventors  
2012 Overseas Expert, presented by the President, Chinese Academy of Sciences.  
2007 CAREER Award, NSF.  
2003 Research Fellowship, K. C. Wong Foundation (Hong Kong).  
1996 Alexander von Humboldt Research Fellowship, Germany,

### Recent Synergistic Activities:

*Associate Editor:* Science of Advanced Materials (2013-).  
*Editorial Board:* Nature Scientific Reports (2014-); Chemosensors (2020-).  
*Chair, Co-chair and Session Chair for Conferences:* NanoUtah2012 conference, 2010 AIChE Annual Meeting, SLC; 2013 International Symposium on Environmental Science and Technology, held in Dalian; 2013 China-US Symposium on Environmental Science and Technology, Xinjiang Technical Institute of Physics & Chemistry; 2014 International

Symposium on Nanoscience and Nanoengineering: Nanomaterials for Renewable Energy and Clean Environment, Urumqi; 2016 Materials Science & Technology Conference; the 21st International Symposium on Surfactants in Solution (SIS2016); 4th China-US Symposium on Energy (2017).

*Organization Committee of conferences:* Nano Utah Conference 2010 and 2011; 2011 SOLARIS International Conference (Czech Republic); International Conference and Exhibition on Nanotechnology (Nano USA 2018), February 7-9, 2018, San Diego, USA; The 4th International Symposium on Energy and Environmental Photocatalytic Materials (EPPM4, 2021); The 1st International Electronic Conference on Chemical Sensors and Analytical Chemistry (CSAC2021); International Conference on Materials Science, Engineering & Technology, November 1-3, 2022, Los Angeles; 2023 International Conference on Advanced and Emerging Materials (AEM 2023), September 16-17, 2023, Wuhan, China.

*Plenary talks at international conferences:* 2013 Trace Explosive Detection; 4th National Conference on Porphyrins and Phthalocyanines, China, 2017; International Symposium on Nanoscience and Nanotechnology in Environment (ISNNE), Xi'an, China, 2019; 2023 International Conference on Advanced and Emerging Materials (AEM 2023).

*NSF delegation* to the International Conference on Smart Materials and Nanotechnology in Engineering, July 1-4, 2007, Harbin, China.

*Invited talks:* over 60 times at universities and research institutes worldwide (including Northwestern, Universities of California, University of Würzburg, Tsinghua University, Peking university, Berkeley National Lab, Max Planck Institute, institutes of Chinese Academy of Sciences, etc.), over 50 times at various national and international conferences, such as ACS National Meeting, PITCON Conference, ECS Meeting, Pacificchem, Nanoelectronic Devices for Defense & Security (NANO-DDS) Conference, SciX, NanoTechnology for Defense Conference (NT4D), Chemical and Biological Defense Science & Technology (CBD S&T) Conference, etc.

### **Publications and Patents:**

- 156 papers published, including 17 in *J. Am. Chem. Soc.*, 2 reviews in *Accounts of Chemical Research*, 1 review in *Chemical Reviews*, 1 Perspective in *J. Phys. Chem. Lett.*, and many others in *Angew. Chem.*, *Chem. Commun.*, *Nature Commun.*, *Nano Lett.*, *ACS Nano*, etc.
- Papers have been cited close to 5000 times since 2018 (as of Feb. 11 2023, Google Scholar).
- The top cited 50 papers have average 215 citations each.
- 1 book, Ling Zang, Ed., *Energy Efficiency and Renewable Energy through Nanotechnology*, 2011, Springer-Verlag. 2 Book Chapters.
- 40 IP disclosures (patents issued or pending), about half licensed to industry.

### **Selected Recent Papers (2010-):**

1. Chenglong Liao, Miao Zhang, Qingyun Tian, Xiaomei Yang, Jiangfan Shi, Shuai Chen, Yanke Che, Chuanyi Wang, Ling Zang\*, Selective turn-on fluorescence detection of formaldehyde in the gas phase, *Sensors and Actuators B: Chem.*, **375** (2023) 132861.
2. Miao Zhang, Rana Dalapati, Chenglong Liao, Jiangfan Shi, Qingyun Tian, Chuanyi Wang, Xiaomei Yang, Shuai Chen\*, Marc D. Porter\*, Ling Zang\*, Fluorescent Sensor Based on Solid-phase Extraction with Negligible Depletion, *Analytica Chimica Acta*, 1245 (2023) 340828.

3. Rana Dalapati, Matthew Hunter and Ling Zang\*, A Dual Fluorometric and Colorimetric Sulfide Sensor Based on Coordinating Self-Assembled Nanorods: Applicable for Monitoring Meat Spoilage, *Chemosensors*, **10** (2022) 500.
4. Qingyun Tian, Shuai Chen\*, Jiarui Yu, Miao Zhang, Nan Gao, Xiaomei Yang, Chuanyi Wang\*, Xuemin Duan, Ling Zang\*, Tunable Construction of Electrochemical Sensors for Chlorophenols Detection (Review). *Journal of Materials Chemistry C*, **10** (2022) 10171–10195. (highlighted as inside front cover)
5. Wufan Xuan, Lina Zheng, Benjamin R Bunes, Nichole Crane, Fubao Zhou\* and Ling Zang\*, Engineering solutions to breath tests based on an e-nose system for silicosis screening and early detection in miners. *Journal of Breath Research*, **16** (2022), 036001, doi:10.1088/1752-7163/ac5f13 (2022)
6. Nan Gao, Zexu Xue, Jiarui Yu, Shuai Chen\*, and Ling Zang\*, Combined nanoarchitectonics with self-assembly and electrosynthesis for flexible PTCDI@PEDOT films with interpenetrating P-N heterojunction, *Materials Advances*, **3** (2022), 1248-1253.
7. Nan Gao, Jiarui Yu, Qingyun Tian, Jiangfan Shi, Miao Zhang, Shuai Chen, and Ling Zang\*, Application of PEDOT:PSS and Its Composites in Electrochemical and Electronic Chemosensors (**Invited Review**), *Chemosensors*, **9** (2021) 79.
8. Chenglong Liao, Jiangfan Shi, Miao Zhang, Rana Dalapati, Qingyun Tian, Shuai Chen\*, Chuanyi Wang, Ling Zang\*, Optical Chemosensors for Gas Phase Detection of Aldehydes: Mechanism, Material Design and Application (Review), *Materials Advances*, **2** (2021), 6213-6245, doi:10.1039/D1MA00341K.
9. Chenglong Liao, Miao Zhang, Nan Gao, Qingyun Tian, Jiangfan Shi, Shuai Chen\*, Chuanyi Wang, and Ling Zang\*, Paper-Based Vapor Detection of Formaldehyde: Colorimetric Sensing with High Sensitivity, *Chemosensors*, **9** (2021) 335.  
<https://doi.org/10.3390/chemosensors9120335>
10. Nan Gao, Jiarui Yu, Shuai Chen\*, Xing Xin, Ling Zang\*, Interfacial polymerization for controllable fabrication of nanostructured conducting polymers and their composites, *Synthetic Metals*, **273** (2021) 116693. <https://doi.org/10.1016/j.synthmet.2020.116693>.
11. Miao Zhang, Jiangfan Shi, Chenglong Liao, Qingyun Tian, Chuanyi Wang, Shuai Chen\*, Ling Zang\*, Perylene Imide-based Optical Chemosensors for Vapor Detection (Invited Review), *Chemosensors*, **9** (2021) 1-26; <https://doi.org/10.3390/chemosensors9010001>.
12. Liping Yang, Pengyuan Wang, Shangwei Zhang, Yuanhao Wang, Ling Zang, Hui Zhu, Jiao Yin\* and Hui Ying Yang\*, Flexible and additive-free organic electrodes for aqueous sodium ion batteries, *J. Mater. Chem. A*, **8** (2020) 22791-22801.
13. Yu Xue, Shuai Chen\*, Jiarui Yu, Benjamin R. Bunes, Zexu Xue, Jingkun Xu, Baoyang Lu\*, and Ling Zang\*, Nanostructured Conducting Polymers and Their Composites: Synthesis Methodologies, Morphologies and Applications (**Review**), *J. Mater. Chem. C*, **8** (2020) 10136-10159.
14. Shuai Chen, Xueze Xu, Nan Gao, Xiaomei Yang, Ling Zang\*, Perylene Diimide-based Fluorescent and Colorimetric Sensors for Environmental Detection (**Invited Review**), *Sensors*, **20** (2020) 917.
15. Hao Fu, Hongyun Shao, Liwei Wang\*, Han Jin\*, Dehua Xia, Shengwei Deng, Yinghui Wang, Yi Chen, Changzhou Hua, Li Liu, Ling Zang\*, From Relative Hydrophobic and Triethylamine (TEA) Adsorption Preferred Core-shell Heterostructure to Humidity

- Resistance and TEA Highly Selective Sensing Prototype: An Alternative Approach to Improve the Sensing Characteristics of TEA Sensors, *ACS Sensors*, **5** (2020) 571-579.
16. Zexu Xue, Shuai Chen\*, Nan Gao, Yu Xue, Baoyang Lu, Olivia Anielle Watson, Ling Zang\*, Jingkun Xu\*, Structural Design and Applications of Stereoregular Fused Thiophenes and Their Oligomers and Polymers (**Review**), *Polymer Reviews*, **60** (2020) 318-358.
  17. Zexu Xue, Shuai Chen\*, Yu Xue, Olivia Anielle Watson, Ling Zang\*, Tunable nanofibril heterojunctions for controlling interfacial charge transfer in chemiresistive gas sensors (invited Review), *J. Mater. Chem. C*, **7** (2019) 13709-13735
  18. Liping Yang, Maomao Wang, Paul M. Slattum, Benjamin R. Bunes, Yuanhao Wang\*, Chuanyi Wang,\* and Ling Zang,\* Donor-Acceptor Supramolecular Organic Nanofibers as Visible Light Photoelectrocatalyst for Hydrogen Production, *ACS Appl. Mater. Interfaces*, **10** (2018) 19764-19772.
  19. Yonghui Wang, Defang Xu, Huaizhi Gao, Ying Wang, Xingliang Liu,\* Aixia Han, Chao Zhang, Ling Zang\*, Twisted Donor–Acceptor Cruciform Luminophores Possessing Substituent-Dependent Properties of Aggregation-Induced Emission and Mechanofluorochromism. *J. Phys. Chem. C*, **122** (2018) 2297-2306.
  20. Na Wu, Yaqiong Zhang, Chen Wang, Paul M. Slattum, Xiaomei Yang, and Ling Zang\*, Thermo-activated Electrical Conductivity in Perylene Diimide Nanofiber Materials, *J. Phys. Chem. Lett.*, **8** (2017) 292-298.
  21. Na Wu, Chen Wang, Paul M. Slattum, Yaqiong Zhang, Xiaomei Yang, Ling Zang\*, Persistent Photoconductivity in Perylene Diimide Nanofiber Materials, *ACS Energy Letters*, **1** (2016) 906-912.
  22. Daniel L. Jacobs, Ling Zang\*, Thermally Induced Recrystallization of MAPbI<sub>3</sub> Perovskite Under Methylamine Atmosphere: An Approach to Fabricating Large Uniform Crystalline Grains, *Chem. Commun.*, **52** (2016) 10743-10746.
  23. Chen Wang, Benjamin R. Bunes, Miao Xu, Na Wu, Xiaomei Yang, Dustin E. Gross, Ling Zang\*, Interfacial Donor-acceptor Nanofibril Composites for Selective Alkane Vapor Detection, *ACS Sensors*, **1** (2016) 552-559.
  24. Ling Zang, Interfacial Donor–Acceptor Engineering of Nanofiber Materials To Achieve Photoconductivity and Applications, *Accounts of Chemical Research*, **48** (2015) 2705-2714.
  25. Shuai Chen, Paul Slattum, Chuanyi Wang\*, Ling Zang\*, Self–Assembly of Perylene Imide Molecules into 1D Nanostructures: Methods, Morphologies and Applications, *Chem. Rev.*, **115** (2015) 11967-98.
  26. Ji-Min Han, Miao Xu, Brian Wang, Na Wu, Xiaomei Yang, Haori Yang, Bill J. Salter and Ling Zang\*, Low Dose Detection of Gamma Radiation via Solvent Assisted Fluorescence Quenching, *J. Am. Chem. Soc.*, **136** (2014) 5090-5096.
  27. Helin Huang, Ching-En Chou, Yanke Che, Ligui Li, Chen Wang, Xiaomei Yang, Zhonghua Peng\*, and Ling Zang\*, Morphology control of nanofibril donor-acceptor heterojunction to achieve high photoconductivity: exploration of new molecular design rule, *J. Am. Chem. Soc.*, **135** (2013) 16490-16496.
  28. Yanke Che, Dustin E. Gross, Helin Huang, Dongjiang Yang, Xiaomei Yang, Emre Discekici, Zheng Xue, Huijun Zhao, Jeffrey S. Moore\*, Ling Zang\*, Diffusion-Controlled Detection of TNT: Interior Nanoporous Structure and Low HOMO Level of Building Blocks Enhance Selectivity and Sensitivity, *J. Am. Chem. Soc.*, **134** (2012) 4978-4982.

29. Ismael Díez-Pérez, Zhihai Li, Shaoyin Guo, Christopher Madden, Helin Huang, Yanke Che, Xiaomei Yang, Ling Zang\*, Nongjian Tao\*, Ambipolar Transport in an Electrochemically-gated Single-Molecule Field Effect Transistor, *ACS Nano*, 6 (2012) 7044-7052.
30. Yanke Che, Helin Huang, Miao Xu, Chengyi Zhang, Benjamin R. Bunes, Xiaomei Yang, Ling Zang\*, Interfacial Engineering of Organic Nanofibril Heterojunctions into Highly Photoconductive Materials, *J. Am. Chem. Soc.*, **133** (2011) 1087-1091.
31. Zengxing Zhang, Yanke Che, Ronald A. Smaldone, Benjamin R. Bunes, Jeffrey S. Moore,\* Ling Zang,\* Reversible Dispersion and Release of Carbon Nanotubes Using Foldable Oligomers, *J. Am. Chem. Soc.* **132** (2010) 14113–14117.
32. Ismael Diez-Perez, Zhihai Li, Joshua Hihath, Jinghong Li\*, Chengyi Zhang, Xiaomei Yang, Ling Zang\*, Yijun Dai, Xinliang Feng, Klaus Muellen\* and Nongjian Tao,\* Gate-controlled electron transport in coronenes as a bottom-up approach towards graphene transistors, *Nature Communications.*, **1**, 1–5 (2010) DOI: 10.1038/ncomms1029.
33. Yanke Che, Xiaomei Yang, Guilin Liu, Chun Yu, Hongwei Ji, Jianmin Zuo, Jincui Zhao,\* and Ling Zang\*, Ultrathin N-type Organic Nanobelts with High Photoconductivity and Application in Optoelectronic Vapor Sensing of Explosives, *J. Am. Chem. Soc.* **132** (2010) 5743-5750.