Mei-Yan Gao

Gender: Female
Tel: +86-19905902886 (China); +1-5109447292 (US)
Email: meiyan.gao@berkeley.edu
mygao2016@163.com
ORCiD: https://orcid.org/0000-0001-6628-5190
Google Scholar: scholar.google.com.hk/citations?user=CGomQegAAAAJ&hl=zh-CN
Address: Department of Chemistry, University of California Berkeley, CA 94720, United States

★ Research Interests

Crystal engineering of Metal–organic frameworks (MOFs), Covalent Organic Frameworks (COFs), Metal organic materials (MOMs), Metal-oxide clusters (MOCs), and their applications in gas storage, hydrocarbon separation, catalysis etc.

★ Employment

- **Postdoctoral Scholar** **01/07/2023 – Present**
  Department of Chemistry, University of California, Berkeley, US
  Responsibilities: The chemistry of MOF's, COF's, ZIF's, and related systems in the realm of reticular chemistry
  Supervisor: *Prof. Omar M. Yaghi* (Member of the National Academy of Sciences in the United States, James and Neeltje Tretter Chair Professor of Chemistry, UC Berkeley)
- **Assistant Researcher** **21/07/2017 – 19/04/2019**
  Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, China
  Responsibilities: Synthesis and characterization of highly symmetric titanium-oxo clusters and Ag-doped titanium-oxo clusters, and their applications for photocatalysis and optical limiting.
  Supervisor: *Prof. Jian Zhang & Prof. Lei Zhang*

★ Education Background

- **Doctor of Philosophy, Chemical Science** **18/06/2019 – 31/08/2023**
  University of Limerick
  Supervisor: *Prof. Michael J. Zaworotko* (Fellow of the Irish Academy, Bernal Chair of Crystal Engineering and Science Foundation of Ireland Research Professor, UL)

  Visiting PhD Student **01/02/2023 – 30/04/2023**

  University of Manchester

  Supervisor: *Prof. Martin Schröder* (Vice-President of The University of Manchester and Dean of the Faculty of Science and Engineering) and *Prof. Sihai Yang*
- **Master of Science, Inorganic Chemistry**, **GPA: 3.89** **01/09/2014 – 21/06/2017**
  Fuzhou University (One of the National 211-Project Key Construction Universities) & Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences (FJIRSM, CAS)
  Supervisor: *Prof. Jian Zhang (Deputy director of the institute, Supervisor: Prof. Xianhui Bu) & Lei Zhang (Supervisor: Prof. Wolfgang Schmitt)*
- **Bachelor of Science, Applied Chemistry**, **GPA: 3.63** **01/09/2010 – 26/06/2014**
  Yantai University
  Supervisor: *Prof. Tao He* (Deputy Dean of College of Chemistry & Chemical Engineering)

★ Research Experiences

- **Doctoral thesis project** **18/06/2019 – 31/08/2023**

Crystal Engineering of Metal Organic Materials for the Adsorptive Separation of Hydrocarbons (gas and vapor separation)

- **Master's thesis project** **01/09/2014 – 21/06/2017**

Polyoxotitanate nanoparticles are technologically important materials with wide applications in solar energy conversion. As the structure and reactivity model compounds of polyoxotitanate nanoparticles, molecular titanium-oxo clusters have recently attracted increasing research interests. My thesis topic was "Synthesis and characterization of high nuclearity titanium-oxo clusters for energy conversion".

- **Bachelor's thesis project** **01/09/2010 – 26/06/2014**

Preparation and characterization of Ti-O-Si composites (SiO_2@TiO_2 core-shell materials)

★ Guest Editor

Mei-Yan Gao, Shi-Qiang Wang, "Metal-Organic Materials: Synthesis, Structures, Properties and Applications" Chemical Synthesis, special issue (in preparation)

★ Invited Reviewer Board

Science Journal of Chemistry (http://www.journalchemistry.org/reviewers)

Chemical Synthesis

Smartmat (IF factor = 20.4)

★ Youth editorial board members

Chemical synthesis

★ Book Chapters

- **Mei-Yan Gao**, Lei Zhang* and Jian Zhang*. "Exploration of Controllable Synthesis and Structural Diversity of Titanium-Oxo Clusters", in Atomically Precise Nanochemistry, Wiley book, **2023**, Chapter 14 (w9781119788645c14), ISBN: 978-1-119-78864-5, Editor: Rongchao Jin, De-en Jiang.

★ Peer-reviewed Publications *(h-index: 17, citations: ~1207 of May 2024)*

$^{+}$ = contributed equally author, * = corresponding author

1. **Mei-Yan Gao**, Andrey A. Bezrukov, Bai-Qiao Song, Meng He, Sousa Javan Nikkhah, Shi-Qiang Wang, Naveen Kumar, Shaza Darwish, Debobroto Sensharma, Chenghua Deng, Jiangnan Li, Lunjie Liu, Rajamani Krishna, Matthias Vandichel, Sihai Yang, and Michael J. Zaworotko*, "Highly Productive C_3H_4/C_3H_6 Trace Separation by a Packing Polymorph of a Layered Hybrid Ultramicroporous Material", ***J. Am. Chem. Soc.*** **2023**, 145, 11837–11845.

2. **Mei-Yan Gao**, Zirui Wang, Qiao-Hong Li,* Dejing Li, Yayong Sun, Yassin H. Andaloussi, Chao Ma, Chenghua Deng, Jian Zhang and Lei Zhang*, "Black Titanium-Oxo Clusters with Ultralow Band Gaps and Enhanced Nonlinear Optical Performance" ***J. Am. Chem. Soc.***, **2022**, *144*, 8153-8161.

3. **Mei-Yan Gao**,[+] Hui Bai,[+] Xiaofeng Cui,* Shuyan Liu, Shan Ling, Tingting Kong, Bing Bai, Canyu Hu, Yitao Dai, Yingguo Zhao, Lei Zhang,* Jian Zhang and Yujie Xiong*, "Precisely Tailoring Heterometallic Polyoxotitanium Clusters for Efficient and Selective Photocatalytic Hydrocarbons Oxidation", ***Angew. Chem. Int. Ed.***, **2022**, *61*, e202215540.

4. **Mei-Yan Gao**, Kai Wang, Yayong Sun, Dejing Li, Bai-Qiao Song, Yassin H. Andaloussi, Michael J. Zaworotko, Jian Zhang and Lei Zhang*, "Tetrahedral Geometry Induction of Stable Ag-Ti Nanoclusters by Flexible Trifurcate TiL_3 Metalloligand" ***J. Am. Chem. Soc.***, **2020**, *142*, 12784-12790.

5. **Mei-Yan Gao**, Fei Wang, Zhigang Gu, Dexiang Zhang, Lei Zhang* and Jian Zhang*, "Fullerene-Like polyoxotitanium cage with high solution stability" ***J. Am. Chem. Soc.***, **2016**, *138*, 2556-2559. (**Highly Cited Paper**)

6. **Mei-Yan Gao**, Debobroto Sensharma, Andrey A. Bezrukov, Amin Koochaki, Yassin H. Andaloussi, Shaza Darwish, Chenghua Deng, Matthias Vandichel, Jian Zhang and Michael J. Zaworotko*, "A Robust Molecular Porous Material for C_2H_2/CO_2 Separation", ***Small***, **2023**, 19, 2206945.

7. **Mei-Yan Gao**, Shi-Qiang Wang, Andrey A. Bezrukov, Shaza Darwish, Bai-Qiao Song, Chenghua Deng, Lunjie Liu, Boya Tang, Shan Dai, Sihai Yang, and Michael J. Zaworotko* "Switching Adsorbent Layered Material that Enables Stepwise Capture of C8 Aromatics via Single-Crystal-to-Single-Crystal Transformations", ***Chem. Mater.***, **2023**, *35*, 10001-10008.

8. Xiaofeng Cui, Xueting Wang, Cong Fu, **Mei-Yan Gao**,* Tingting Kong,* Yujie Xiong* "Tuning the Local Coordination Environment of Silver(I) Coordination Networks with Counterions for Enhanced Electrocatalytic CO_2 Reduction", ***Sci. China Chem***, **2024**, *67*, 1524-1530.

9. **Mei-Yan Gao**,[+] Bai-Qiao Song,[+] Debobroto Sensharma and Michael J. Zaworotko*, "Crystal Engineering of porous coordination networks for C3 Hydrocarbon Separation", ***SmartMat.***, **2021**, *2*, 38-55. **(**Review, **Inside Back Cover**, IF factor: 20.4**)**

10. **Mei-Yan Gao**, Jian Zhang* and Lei Zhang*, "Acid-Controlled Synthesis of Carboxylate-Stabilized Ti_{44}-Oxo Clusters: Scaling up Preparation, Exchangeable Protecting Ligands and Photophysical Properties", ***Chem. Eur. J.*** **2019**, *25*, 10450-10455.

11. **Mei-Yan Gao**, Xi Fan, Lei Zhang* and Jian Zhang, "Dicarboxylate ligands-oriented assembly of $Ti_3(\mu_3\text{-O})\}$ units: from dimer to coordination triangles and rectangles", ***Inorg. Chem.***, **2018**, *57*, 5642-5647.

12. **Mei-Yan Gao**, Shumei Chen, Lanxia Hu, Lei Zhang* and Jian Zhang*, "Synthesis and photocatalytic H_2 evolution properties of four titanium-oxo-clusters based on cyclohex-3-ene-1-carboxylate ligand", ***Dalton Trans.***, **2017**, *46*, 10630-10634.

13. **Mei-Yan Gao**, Weihui Fang,* Tian Wen, Lei Zhang* and Jian Zhang, "Connecting titanium-oxo clusters by nitrogen heterocyclic ligands to produce multiple cluster-series with photocatalytic H_2 evolution activities" ***Cryst. Growth Des.***, **2017**, *17*, 3592-3595.

14. **Mei-Yan Gao**, Jian Zhang* and Lei Zhang*, "Preparation and properties of polyoxo-

titanium clusters", ***Chin. Sci. Bull.***, **2018**, *63*, 2731-2744. **(Invited review)**

15. **Mei-Yan Gao**, Xiaoxue Liu, Wei-Hui Fang, Lei Zhang* and Jian Zhang, "Synthesis and structural characterization of a dumbbell-like phenolphosphonate-stabilized Ti_7-oxo cluster", ***Acta Cryst. C***, **2018,** *C74*, 1248-1251. **(Polyoxometalates special issue)**

16. **Mei-Yan Gao**, Jian Zhang* and Lei Zhang*, "The synthesis and structure of a series of Ti6-oxo clusters functionalized by *in situ* esterified dicarboxylate", ***Chin. J. Chem.,*** **2021**, *39*, 1259-1264.

17. Jinxiu Liu, **Mei-Yan Gao**, Weihui Fang, Lei Zhang* and Jian Zhang*, "Bandgap engineering of titanium-oxo clusters: surface labile sites method for ligand substitution and metal incorporation", ***Angew. Chem. Int. Ed.***, **2016**, *128,* 5246-5251.

18. Lunjie Liu, **Mei-Yan Gao**, Haofan Yang, Xiaoyan Wang, Xiaobo Li* and Andrew Cooper*, "Linear Conjugated Polymers for Solar-Driven Hydrogen Peroxide Production: The Importance of Catalyst Stability" ***J. Am. Chem. Soc.***, **2021**, *143,* 19287-19293.

19. Bai-Qiao Song, Mohana Shivanna, **Mei-Yan Gao**, Ken-ichi Otake, Shi-Qiang Wang, Chenghua Deng, Qing-Yuan Yang,* Matthias Vandichel, Susumu Kitagawa and Michael J. Zaworotko*, "Shape-Memory Effect Enabled by Ligand Substitution and CO_2 Affinity in a Flexible SIFSIX Coordination Network", ***Angew. Chem. Int. Ed.***, **2023**, *62*, e202309985.

20. Zhiqiang Jiang, Jinxiu Liu, **Mei-Yan Gao**, Xi Fan, Lei Zhang* and Jian Zhang*, "Assembling Polyoxo-Titanium Clusters and CdS Nanoparticles to Porous Matrix for Efficient and Tunable H_2 Evolution Activities with Visible Light", ***Adv. Mater.***, **2017**, *29*, 1603369.

21. Chenghua Deng, Li Zhao, **Mei-Yan Gao**, Shaza Darwish, Bai-Qiao Song, Debobroto Sensharma, Matteo Lusi, Yun-Lei Peng,* Soumya Mukherjee* and Michael J. Zaworotko* "Ultramicroporous Lonsdaleite Topology MOF with High Propane Uptake and Propane/Methane Selectivity for Propane Capture from Simulated Natural Gas" ***ACS Materials Lett.***, **2024**, *6*, 56-65.

22. Lanxia Hu, **Mei-Yan Gao,** Tian Wen*, Yao Kang* and Shu-Mei Chen, "Synthesis of halide-modulated cuprous (I) coordination polymers with mechanochromic and photocatalytic properties", ***Inorg. Chem.***, **2017**, *56*, 6507-6511.

23. Xi Fan, Nagaraju Narayanam, **Mei-Yan Gao**, Lei Zhang* and Jian Zhang, "Ligands dependent assembly of trinuclear titanium-oxo units into coordination tetrahedron and capsule", ***Dalton Trans.***, **2018**, *47*, 663-665.

24. Xi Fan, Hao Fu **Mei-Yan Gao**, Lei Zhang* and Jian Zhang*, "One-Pot and Postsynthetic Phenol-Thermal Synthesis toward Highly Stable Titanium-Oxo Clusters", ***Inorg. Chem.*** **2019**, 58, *19*, 13353-13359.

25. Ya-Jie Liu,[+] Ping Shao,[+] **Mei-Yan Gao**, Wei-Hui Fang* and Jian Zhang*, "Synthesis of Ag-doped polyoxotitanium nanoclusters for efficient electrocatalytic CO_2 reduction", ***Inorg. Chem.*** **2020**, *59*, 11442-11448.

26. Ai-Ping Zheng, **Mei-Yan Gao**, Fang Wei-Hui* and Kang Yao*, "Two novel $\{Ti_6P_2\}$ clusters decorated with inorganic acids", ***Chin. J. Struct. Chem.***, **2021**, *40*, 277-282.

27. Yayong Sun, Dong-Fei Lu, Yuexin Sun, **Mei-Yan Gao**, Nan Zheng, Cheng Gu, Fei Wang* and Jian Zhang*, "Large Titanium-oxo Clusters as Precursors to Synthesize the Single Crystals of Ti-MOFs", ***ACS Materials Lett.***, **2021**, *3*, 64-68.

28. Yayong Sun, **Mei-Yan Gao**, Yuexin Sun, Dong-Fei Lu, Fei Wang* and Jian Zhang*, "Two Isostructural Titanium Metal-Organic Frameworks for Light Hydrocarbon Separation", ***Inorg. Chem.***, **2021**, *60*, 13955-13959.

29. Yongliang Zhang, Manh Xuan Pham, Thomas G. Keating, Na Jia, Anthony Mullen, Devika Laishram, **Mei-Yan Gao**, Brian Corbett, Pai Liu, Xiao Wei Sun, Tewfik Soulimane, Christophe Silien, Kevin M. Ryan, Zhenhui Ma* and Ning Liu*, "Highly Efficient Inverted Light-Emitting Diodes Based on Vertically Aligned CdSe-CdS Nanorod Layers Fabricated by Electrophoretic Deposition", ***ACS Appl. Mater. Interfaces***, **2024**, *16*, 10459–10467.

30. Chenghua Deng, Bai-Qiao Song, Matteo Lusi, Andrey A. Bezrukov, Molly M. Haskins, **Mei-Yan Gao**, Yun-Lei Peng, Jian-Gong Ma, Peng Cheng, Soumya Mukherjee,* Michael J. Zaworotko*, "Crystal Engineering of a Chiral Crystalline Sponge that Enables Absolute Structure Determination and Enantiomeric Separation", ***Cryst. Growth Des.***, **2023**. *23*, 5211-5220.

31. Xing Han, S. Ephraim Neumann, Brent L. Nannenga, Kaiyu Wang, Kelvin Kam-Yun Li, Saber Mirzaei, Xuan Yao, Chenhui Zhu, **Mei-Yan Gao**, Yue-Biao Zhang, Yong Cui and Omar M. Yaghi*, "Directing Molecular Weaving of Covalent Organic Frameworks and Their Dimensionality by Angular Control", ***J. Am. Chem. Soc.***, **2023**, *145*, 22885-22889.

32. Chenghua Deng, Bai-Qiao Song, Debobroto Sensharma, **Mei-Yan Gao**, Andrey A. Bezrukov, Varvara I. Nikolayenko, Matteo Lusi, Soumya Mukherjee,* Michael J. Zaworotko*, "The Effect of Extra-Framework Anion Substitution on the Properties of a Chiral Crystalline Sponge", ***Cryst. Growth Des.***, **2023**, 23, 8139-8146.

33. Dan Li, **Mei-Yan Gao**, Chenghua Deng, Shao-Jie Qin, and Bai-Qiao Song*, "Cross-Linking $CdSO_4$-Type Nets with Hexafluorosilicate Anions to Form an Ultramicroporous Material for Efficient C_2H_2/CO_2 and C_2H_2/C_2H_4 Separation" ***Small***, **2024**, 2402523.

Manuscripts to be published

34. Xiaofeng Cui, Hui Bai, Jun Zhang, Rong Liu, Yangxiang Wang, Haiyan Yu, Tingting Kong, **Mei-Yan Gao***, Zhou Lu* and Yujie Xiong*, "A molecular-level cluster-nanozyme-coenzyme system mimicking natural photosynthesis under intermittent light irradiation" ***Nat. Nanotechnol.***, **2024**, submitted.

35. **Mei-Yan Gao**, Lunjie Liu, Volodymyr Bon, Chenghua Deng, Bai-Qiao Song, Stefan Kaskel, and Michael J. Zaworotko*, "Light and Pressure Responsive Behavior in a Porous Coordination Network Enabled by Reversible [2 + 2] Photocycloaddition" ***Angew. Chem. Int. Ed.***, **2024**, minor revision.

36. Na Jia,[+] Yixuan Huang,[+] **Mei-Yan Gao**,* Devika Laishram, Hui Yang, Yongliang Zhang,* and Dawei Chu, "Inverted All-inorganic Nanorod-based Light Emitting Diodes Via Electrophoretic Deposition" ***ACS Appl. Electron. Mater.***, **2024**, under review.

37. Yongliang Zhang, Na Jia, Devika Laishram, **Mei-Yan Gao**, Pai Liu[*], Xiao Wei Sun, Tewfik Soulimane, Zhenhui Ma, Christophe Silien, Kevin M. Ryan and Ning Liu*, "Inverted All-inorganic Nanorod-based Light Emitting Diodes Via Electrophoretic Deposition" ***ACS Appl. Nano Mater.***, **2024**, under review.

38. Lunjie Liu, Shaoqing Chen, Xiang Huang, Zian Xu, Yu Xia, **Mei-Yan Gao**, Qin Jin, Baobing Zheng, Chongxuan Liu,* Zhe Zhang* and Hsing-Lin Wang*, "Synthesis of hierarchically porous N-

enriched nanocarbon derived from conjugated polymer as an efficient and durable electrocatalyst for oxygen reduction reaction in Zn-air battery" ***J. Mater. Chem. A***, **2024**, under review.

★ Conference Abstracts

1. **Mei-Yan Gao**, Lei Zhang* and Jian Zhang*, "Structural Design and Performance Research of Titanium-Oxo Clusters with Ti-N bonds" 8th Chinese Coordination Chemistry Conference, Dalian, Liaoning Province, China, 19-23, July. **2017**.
2. **Mei-Yan Gao** and Michael J. Zaworotko*, "C_3H_4/C_3H_6 separation study in a flexible hybrid ultramicroporous material" The 2022 North America-Greece-Cyprus Conference on Paramagnetic Materials (**NAGC 2022**), NissiBlu Hotel, Ayia Napa, Cyprus, 9-13, May. **2022**.
3. **Mei-Yan Gao** and Michael J. Zaworotko*, "A flexible square lattice coordination network for efficient removal of propyne from propylene" International Conference on Metal-Organic Frameworks and Open Framework Compounds 2022 (**MOF2022**), Dresden, Germany, 4-7, September. **2022**.
4. **Mei-Yan Gao**, Sihai Yang and Michael J. Zaworotko*, "Crystal Engineering of Metal Organic Materials for the Adsorptive Separation of Hydrocarbons" British Zeolite Association annual meeting (**BZA2023**), Manchester, UK, 3-5, April. 2023.
5. **Mei-Yan Gao**, Sihai Yang and Michael J. Zaworotko*, "Crystal Engineering of Metal Organic Materials for the Adsorptive Separation of Hydrocarbons" Interdisciplinary Conference on Sustainable Energy Materials, Sheraton Changchun Jingyuetan Hotel, Changchun, China, 24-27, May. **2023**.
6. **Mei-Yan Gao**, and Michael J. Zaworotko*, "Adsorptive Separation of Hydrocarbons in Metal Organic Materials 2023" Academic Seminar for Chinese Students and Scholars (CCS) in Western Europe (Germany-France-Ireland), Online, 26, August. **2023**.

★ Oral Presentations

1. **Mei-Yan Gao**, "Adsorptive Separation of Hydrocarbons in Metal Organic Materials" 2023 Academic Seminar for Chinese Students and Scholars (CCS) in Western Europe (Germany-France-Ireland), Online, 26, August. **2023**.
2. **Mei-Yan Gao*** "Crystal Engineering of Metal Organic Materials for the Adsorptive Separation of Hydrocarbons", Interdisciplinary Conference on Sustainable Energy Materials,Sheraton Changchun Jingyuetan Hotel, Changchun, China, 24-27, May. **2023**.
3. **Mei-Yan Gao*** and Michael J. Zaworotko. "Crystalline Materials for Hydrocarbon Separation", The First China-Ireland PhD Student Forum (CPF-1), University College Dublin (UCD), Dublin, 3, December. **2022**.
4. **Mei-Yan Gao*** and Michael J. Zaworotko. "A Robust Molecular Porous Material for gas Separations", The 2022 North America-Greece-Cyprus Conference on Paramagnetic Materials (**NAGC 2022**), NissiBlu Hotel, Ayia Napa, Cyprus, 9-13, May. **2022**.
5. **Mei-Yan Gao***, Lei Zhang and Jian Zhang. Student Symposium, in the opening ceremony of summer camp for outstanding undergraduates, organized by *FJIRSM, CAS*, Fuzhou, Fujian, China, 17, July, **2017**.

6. **Mei-Yan Gao***, Lei Zhang and Jian Zhang. "Structural Control of Titanium-Oxo Clusters", Graduate Student Academic Forum of FJIRSM, CAS, Fuzhou, Fujian, China, 15-16, May, **2016**.

★ Patent Disclosures

- **Mei-Yan Gao**, Jian Zhang, Lei Zhang. Polyoxo-titanium cluster and synthesis method and application thereof. China, **2016**, Open No. CN 109721624 B *(Issued)*
- Jian Zhang, Lei Zhang, **Mei-Yan Gao**, Macro preparation method of titanium-oxygen cluster compound. China, **2018**, Open No. CN110734458 B *(Issued)*

★ Conference Poster

- **Mei-Yan Gao** and Michael J. Zaworotko*, "A flexible square lattice coordination network for efficient removal of propyne from propylene" International Conference on Metal-Organic Frameworks and Open Framework Compounds (**MOF2022**), Dresden, Germany, 4-7, September. **2022**.
- **Mei-Yan Gao**, Sihai Yang and Michael J. Zaworotko*, "A flexible ultramicroporous layered material for the benchmark separation of propyne and propylene" British Zeolite Association annual meeting (**BZA2023**), Manchester, UK, 3-5, April. **2023**.

★ Selected Honors and Awards

2024 Carbon Future Young Investigator Award	**2024.05.08**
Chinese Government Award for Outstanding Self-financed Students Abroad	**2023**
Best Popularity Award for Academic Seminar for Chinese Students and Scholars (CCS) in Western Europe (Germany-France-Ireland)	***2023***
Exploration Excellent Award from Adamas	**2023**
Outstanding Report Award of Ireland-China PhD Forum (CPF-1)	**2022**
Exploration Excellent Award from Adamas	**2022**
Full doctoral scholarship from Science Foundation Ireland (SFI)	**2019 - 2023**
Excellent Research Assistant of FJIRSM, CAS	**2018**
First-class Award for Outstanding Graduate of FJIRSM, CAS	**2017**
First-class Award for Outstanding Graduate of Fuzhou University	**2017**
Outstanding Graduate of Fuzhou University	**2017**
Best Style Award of Graduate Student Academic Forum of FJIRSM, CAS	**2016**
Third-class Graduate Scholarship of Fuzhou University	**2016**
Excellent Student Cadre Award of Fuzhou University (Vice-President of Graduate Union)	**2015 - 2016**
Excellent Student Cadre Award of Fuzhou University	**2014 - 2015**
Outstanding Graduation Thesis Award of Yantai University	**2014**
Outstanding Student Scholarship of Yantai University	**2012 - 2013**
Outstanding Student Scholarship of Yantai University	**2011 - 2012**

★ Research Techniques and Skills

- **Experiment skills:**

  1. Synthesize ligands.

2. Synthesize crystalline materials (MOCs, MOFs, COFs) via solvothermal method, ionothermal method, hydrothermal method, diffusion method, and microwave method.
3. Analyze and test crystal structure by single crystal X-ray diffraction (SCXRD, Rigagu and Bruker D8). Simulate crystal structure by Materials Studio.
4. Study the properties of samples including gas storage and separation, vapor sorption (water, xylene, and others), C8 aromatic isomer separation, flexibility of structures, CO_2 reduction, [2+2] photocycloaddition, electrochemical general techniques, photocatalytic H_2 evolution, photochromism, nitrogen fixation, ammonia removal from waste water, photoluminescence, third-order nonlinear optical limiting (NLO), etc.

The details are listed as follows:

Olex2, Shelxtl, Platon, Dynamic column breakthrough (DCB), Gas sorption test (3flex, ASAP 2020, 2420, Tristar II), Dynamic Vapor Sorption (DVS), Dynamic test, Powder X-ray diffraction (PXRD), Variable-temperature powder X-ray diffraction (VT-PXRD), Nuclear magnetic resonance (NMR), Scanning electron microscopy (SEM), Thermo gravimetric analysis (TGA), Differential scanning calorimetry (DSC), Transmission electron microscopy (TEM), Fourier transform infrared spectroscopy (FT-IR), X-ray photoelectron spectroscopy (XPS), Contact angle, Photoluminescence (PL), UV-vis absorption spectroscopy (Solid and liquid), Electron Paramagnetic Resonance (EPR), Transient absorption spectroscopy (TAS), In situ IR spectroscopy, Electrospray ionization mass spectrometry (ESI-MS), Circular dichroism (CD), Gas chromatography (GC, Shimadzu Nexis GC-2030), Mass spectrometer (MS), Transient absorption (TA) spectrum, Melting point apparatus, Dynamic vapor sorption (DVS), High-pressure volumetric analyzer (HPVA), Tensile tester, and so on.

- **Computer skills:** Microsoft Office, Materials Studio, Photoshop, Diamond, Mercury, Origin, Endnote, Chemdraw, Chem3D, Jade 6, Photoshop, CSD, MestReNova, Lab Solution, Math Type, Apex 4, CrysAlisPro, HighScore, ToposPro, Crystalexplorer, Surface Xplorer, XPSPEAK41, Matlab, Bond valence sum (BVS), Compass DataAnalysis, cifcheck, etc.
- **Calculation skills:** IAST, Q_{st}, Productivity of separation, Separation factor (α_{AC}), Separation potential (Δq), Bond valence calculation, Particle size distribution, etc.

★ Teaching Experiences

- **University of Limerick**, Department of Chemical Sciences, Limerick, Republic of Ireland

  Teaching Assistant - General Chemistry (08/2019 –06/2023)

  Teaching Assistant - Organic Chemistry (08/2019 –06/2023)

★ Personality

- Brave, Cooperative, Creative, Diligent, Studious, etc.

★ Personality Referees

- Prof. Michael J. Zaworotko (PhD supervisor): Phone: +1 813 857 8322;
  Email: xtal@ul.ie
- Prof. Omar M. Yaghi (Postdoctoral supervisor): Phone: +1 510 643 5507;
  Email: yaghi@berkeley.edu
- Prof. Jian Zhang (Master supervisor): Phone: +86-150 0504 7036;
  Email: zhj@fjirsm.ac.cn
- Prof. Lei Zhang (Master supervisor): Phone: +86-153 3779 0681;
  Email: zhanglei3915@nankai.edu.cn