



Yueqiang Cao

Department: School of Chemical Engineering
Professional field: Chemical Engineering and Technology
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Profile

2022/11-present
Research Fellow, School of Chemical Engineering, East China University of Science and Technology
2020/1-2011/11
Postdoc, School of Chemical Engineering, East China University of Science and Technology
2019/9-2019/12
Research Assistant, Department of Chemical Engineering, Norwegian University of Science and Technology
2017/9-2018/10
Visiting PhD student, Department of Chemistry, University of California, Riverside
2013/9-2019/6
PhD, School of Chemical Engineering, East China University of Science and Technology
2009/9-2013/6
Bachelor, School of Chemical Engineering, Hefei University of Technology

Research Field

Catalysis is the foundation of chemical industry, and more than 30% of chemical process involve catalytic hydrogenations. Catalytic hydrogenations employed in chemical industry normally include complex series-parallel reactions and multi-scale structures, which leads to great challenges in the rational design of hydrogenation catalysts and the regulation of target reaction pathways. Dr. Cao focuses on the catalytic hydrogenation of unsaturated hydrocarbons, unsaturated aldehydes, esters and nitro compounds involved in the synthesis of high-performance polymers and high-end chemicals, and committed to the mechanism- and data-driven design of hydrogenation catalysts

Research results and main published thesis

- [1]Mingxing Ye#, Yurou Li#, Zhirong Yang#, Chang Yao, Weixiao Sun, Xiangxue Zhang, Wen Yao Chen, Gang Qian, Xuezhi Duan, Yueqiang Cao*, Lina Li*, Xingguo Zhou, Jing Zhang*. Ruthenium/TiO₂-Catalyzed Hydrogenolysis of Polyethylene Terephthalate: Reaction Pathways Dominated by Coordination Environment. *Angewandte Chemie International Edition* 2023, 62, e202301024.
- [2]Xiaohu Ge, Yueqiang Cao*, Kelin Yan, Yurou Li, Lihui Zhou, Sheng Dai, Jing Zhang, Xueqing Gong, Gang Qian, Xingguo Zhou, Weikang Yuan, Xuezhi Duan*. Increasing the Distance of Adjacent Palladium Atoms for Configuration Matching in Selective Hydrogenation. *Angewandte Chemie International Edition* 2022, 61, e202215225.
- [3]Xiaohu Ge, Mingying Dou, Yueqiang Cao*, Xi Liu*, Qiang Yuwen, Jing Zhang, Gang Qian, Xueqing Gong, Xingguo Zhou, Liwei Chen, Weikang Yuan, Xuezhi Duan*. Mechanism Driven Design of Trimer Ni₁Sb₂ Site Delivering Superior Hydrogenation Selectivity to Ethylene. *Nature Communications* 2022, 13, 5534.
- [4]Kelvin Yan, Yueqiang Cao*, Xiaohu Ge, Yurou Li, Jing Zhang, Xueqing Gong, Gang Qian, Xingguo Zhou, Xuezhi Duan*. Kinetics-Assisted Identification and Regulation of Active Sites for Pd-Catalyzed Propyne Selective Hydrogenation. *AIChE Journal* 2022, DOI: 10.1002/aic.17922.
- [5]Zuwei Luo, Xiaofeng Xu, Guilin Dong, Yueqiang Cao*, Shen Hu, Guanghua Ye, Yi-An Zhu, Jinghong Zhou*, Wei Li, Xingguo Zhou. Regulating Mesopore Structures of Support toward Enhanced Selective Hydrogenation of Dimethyl Oxalate to Methyl Glycolate on Ag Catalysts. *Chemical Engineering Journal* 2022, 450, 138397.
- [6]Yurou Li#, Kelin Yan#, Yueqiang Cao*, Xiaohu Ge, Xingguo Zhou, Weikang Yuan, De Chen, Xuezhi Duan*. Mechanistic and Atomic-Level Insights into Semi-Hydrogenation Catalysis to Light Olefins. *ACS Catalysis* 2022, 12, 12138-12161.
- [7]Yueqiang Cao#, Xiaohu Ge#, Yurou Li, Rui Si, Zhijun Sui, Jinghong Zhou, Xuezhi Duan*, Xingguo Zhou. Structural and Kinetics Understanding of Support Effects in Pd-catalyzed Semi-Hydrogenation of Acetylene. *Engineering* 2021, 7, 103-110.
- [8]Yueqiang Cao, Wenzhao Fu, Zhouhong Ren, Zhijun Sui, Jinghong Zhou, Jun Luo, Xuezhi Duan*, Xingguo Zhou*. Tailoring Electronic Properties and Kinetics Behaviors of Pd/N-CNTs Catalysts for Selective Hydrogenation of Acetylene. *AIChE Journal* 2020, 66, e16857.
- [9]Yueqiang Cao#, Hao Zhang#, Shufang Ji, Zhijun Sui, Zheng Jiang, Dingsheng Wang*, Francisco Zaera, Xingguo Zhou, Xuezhi Duan*, Yadong Li. Adsorption Site Regulation to Guide Atomic Design of Ni-Ga Catalysts for Acetylene Semi-Hydrogenation. *Angewandte Chemie International Edition* 2020, 59, 11647-11652.
- [10]Yueqiang Cao, Jonathan Guerrero-Sanchez, Ilkeun Lee, Xingguo Zhou, Noboru Takeuchi, Francisco Zaera*. Kinetic Study of the Hydrogenation of Unsaturated Aldehydes Promoted by CuPt_x/SBA-15 Single-Atom Alloy (SAA) Catalysts. *ACS Catalysis* 2020, 10, 3431-3443.

科研项目 Fundings

1. 国家科技部重点研发计划课题 2022YFA1503502 子课题，主持
2. 国家自然科学基金青年基金，主持
3. 上海市“超级博士后激励计划”，主持
4. GF 项目子课题，主持
5. 中国博士后科学基金特别资助（站中），主持
6. 中国博士后科学基金面上资助，主持
7. 国家科技部重点研发计划课题 2018YFB0604704，研究骨干

荣誉与获奖情况 Honors and Awards

1. 2023 年，中国科协第九届青年人才托举工程
2. 2023 年，上海市青年科技启明星（A 类）
3. 2022 年，中国化工学会基础研究成果奖一等奖（排名第二）
4. 2021 年，上海市产学研合作优秀项目奖一等奖（排名第六）
5. 2020 年，中国石油和化学工业联合会 CPCIF-Clariant 可持续发展青年创新奖优秀奖
6. 2020 年，上海市青年五四奖章集体
7. 2019 年，中国化工学会杨光华新秀奖

申请 / 授权专利 Patents

1. 一种负载型 Ni-Sb 催化剂及其制备方法与应用，CN114957107A.
2. 负载型 Ni-Ga-Pd 催化剂及其制备方法与应用，CN111617772A.
3. 高分散金属 - 氧化物双功能催化剂及其制备方法与应用，CN111632596A.
4. 一种 Pd-In 金属间化合物催化剂及其制备方法与应用，202211052126.4.
5. 一种微通道连续合成 2,6- 二氨基 -3,5- 二硝基吡啶的方法，CN114957107A.
6. 一种银硅催化剂的制备方法，银硅催化剂及其应用，CN112387306A.
7. 一种合成乙交酯的方法，CN113387921A.
8. 一种分离乙二醇和 1,2- 丁二醇混合醇的变压精馏系统，ZL201921171170.0.
9. 一种负载型 Ni-In-M 催化剂及其制备方法与应用，202111159405.6.