

YANGJIAN QUAN

Education:

- 2015 Ph.D. (Supervisor: Prof. Zuowei Xie, 谢作伟院士), The Chinese University of Hong Kong
- 2011 B.Sc. (Supervisor: Prof. Lin Dong, 董林教授), Nanjing University

Professional Chronology:

- Since 6/2021 Assistant Professor, Department of Chemistry, The Hong Kong University of Science and Technology
- 7/2019-5/2021 Postdoc Scholar (Supervisor: Prof. Wenbin Lin, 林文斌教授), Department of Chemistry, University of Chicago
- 9/2015-7/2019 Research Assistant Professor, Department of Chemistry, The Chinese University of Hong Kong (CUHK)

Honors & Awards:

- 2019 Ministry of Education Higher Education Outstanding Scientific Research Output Awards in Natural Sciences (Second Author)
- 2014-2015 Postgraduate Research Output Award, CUHK
- 2011-2015 Hong Kong PhD Fellowship (<https://cerg1.ugc.edu.hk/hkpfs/index.html>)
- 2011 Outstanding Graduate Award of Nanjing University

Research Interests:

Boron chemistry; metal-organic frameworks; catalysis; organometallics; photochemistry; electrochemistry.

PhD Students (Co-Supervised with Prof. Zuowei Xie): 3

Grant Records:

- National Natural Science Foundation of China (NSFC)/Research Grants Council (RGC) Joint Research Scheme as PI**, "Synthesis of New Carborane-Based Ligands and Their Applications in Rare-Earth Metal Chemistry", **HK\$ 1,076,374**, 2019, Project No: N_CUHK402/18.
- Hong Kong RGC General Research Fund (GRF) as PI**, "Selective Functionalization of Carboranes via Base Metal Catalyzed Cage B-H Activation", **HK\$ 558,272**, 2019, Project No: 14305719.
- Hong Kong RGC General Research Fund (GRF) as PI**, "Multi-Functionalization of Carboranes via a "Cage-Walking" Strategy and Its Mechanistic Study", **HK\$ 505,298**, 2018, Project No: 14305018.
- Hong Kong RGC General Research Fund (GRF) as PI**, "Catalytic Regioselective Dehydrogenative Cross-Coupling of Cage B-H with Organic X-H (X = C, B, O, N, S) for Functionalization of Carboranes", **HK\$ 522,898**, 2017, Project No: 14305017.
- Direct Grant for Research (CUHK) as PI**, "Synthesis and Property Investigation of Cage B-Substituted-Carborane-Based Materials", **HK\$ 150,000**, 2016.

List of Publications (for details see [google scholar](#)):

Corresponding and/or First Author (*corresponding, †equal contribution)

1. Y. K. Au, J. Zhang, **Y. Quan**,* Z. Xie,* Ir-Catalyzed Selective B(3)-H Amination of *o*-Carboranes with NH₃. *J. Am. Chem. Soc.* **2021**, *143*, 4148–4153.
2. **Y. Quan**,† W. Shi,† Y. Song, X. Jiang, C. Wang, W. Lin* Bifunctional Metal–Organic Layer with Organic Dyes and Iron Centers for Synergistic Photoredox Catalysis. *J. Am. Chem. Soc.* **2021**, *143*, 3075–3080.
3. **Y. Quan**,† G. Lan,† W. Shi,† Z. Xu, Y. Fan, E. You, X. Jiang, C. Wang, W. Lin* Metal–Organic Layers Hierarchically Integrate Three Synergistic Active Sites for Tandem Catalysis. *Angew. Chem. Int. Ed.* **2021**, *60*, 3115–3120.
4. **Y. Quan**,† Y. Song,† W. Shi, Z. Xu, J. S. Chen, X. Jiang, C. Wang, W. Lin,* Metal–Organic Framework with Dual Active Sites in Engineered Mesopores for Bioinspired Synergistic Catalysis. *J. Am. Chem. Soc.* **2020**, *142*, 8602–8607 (†co-first author).
5. Y. K. Au,† H. Lyu,† **Y. Quan**,* Z. Xie,* Copper-Catalyzed Electrochemical Selective B–H Oxygenation of *o*-Carboranes at Room Temperature. *J. Am. Chem. Soc.* **2020**, *142*, 6940–6945.
6. **Y. Quan**,† G. Lan,† Y. Fan, W. Shi, E. You, W. Lin,* Metal–Organic Layers for Synergistic Lewis Acid and Photoredox Catalysis. *J. Am. Chem. Soc.* **2020**, *142*, 1746–1751 (†co-first author).
7. G. Lan,† **Y. Quan**,† M. Wang, G. T. Nash, E. You, Y. Song, S. S. Veroneau, X. Jiang, W. Lin,* Metal–Organic Layers as Multifunctional Two-Dimensional Nanomaterials for Enhanced Photoredox Catalysis. *J. Am. Chem. Soc.* **2019**, *141*, 15767–15772 (†co-first author).
8. Y. K. Au, H. Lyu, **Y. Quan**,* Z. Xie,* Catalytic Cascade Dehydrogenative Cross-Coupling of BH/CH and BH/NH: One-Pot Process to Carborano-Isoquinolinone. *J. Am. Chem. Soc.* **2019**, *141*, 12855–12862 (JACS Cover Art).
9. H. Lyu, J. Zhang, J. Yang, **Y. Quan**,* Z. Xie,* Catalytic Regioselective Cage B(8)–H Arylation of *o*-Carboranes via “Cage-Walking” Strategy. *J. Am. Chem. Soc.* **2019**, *141*, 4219–4224.
10. H. Lyu, **Y. Quan**,* Z. Xie,* Transition Metal Catalyzed Direct Amination of Cage B(4)–H Bond in *o*-Carboranes: Synthesis of Tertiary, Secondary and Primary *o*-Carboranyl Amines. *J. Am. Chem. Soc.* **2016**, *138*, 12727–12730.
11. **Y. Quan**, Z. Xie,* Palladium-Catalyzed Regioselective Diarylation of *o*-Carboranes via Direct Cage B-H Activation. *Angew. Chem., Int. Ed.* **2016**, *55*, 1295–1298.
12. **Y. Quan**, Z. Xie,* Palladium-Catalyzed Regioselective Intramolecular Coupling of *o*-Carborane with Aromatics via Direct Cage B-H Activation. *J. Am. Chem. Soc.* **2015**, *137*, 3502–3505.
13. **Y. Quan**, Z. Xie,* Iridium Catalyzed Regioselective Cage Boron Alkenylation of *o*-Carboranes via Direct Cage B-H Activation. *J. Am. Chem. Soc.* **2014**, *136*, 15513–15516 (Highlighted in JACS spotlights, *J. Am. Chem. Soc.* **2014**, *136*, 15807, and Synfacts).

14. **Y. Quan**, Z. Qiu, Z. Xie,* Transition-Metal-Mediated Three-Component Cascade Cyclization: Selective Cage B–C(sp²) Coupling of Carborane with Aromatics and Synthesis of Carborane-Fused Tricyclics. *J. Am. Chem. Soc.* **2014**, *136*, 7599–7602.
15. **Y. Quan**, J. Zhang, Z. Xie,* Three-Component [2+2+1] Cross-Cyclotrimerization of Carboryne, Unactivated Alkene, and Trimethylsilylalkyne Co-Mediated by Zr and Ni. *J. Am. Chem. Soc.* **2013**, *135*, 18742–18745.
16. Y. Chen, **Y. Quan**,* Z. Xie,* 8-Aminoquinoline as a Bidentate Traceless Directing Group for Cu-Catalyzed Selective B(4,5)–H Disulfenylation of *o*-Carboranes. *Chem. Commun.* **2020**, *56*, 12997-13000.
17. Y. Chen, **Y. Quan**,* Z. Xie,* Ir-Catalyzed Selective Dehydrogenative Cross-Coupling of Aryls with *o*-Carboranes via a Mixed Directing-Group Strategy. *Chem. Commun.* **2020**, *56*, 7001-7004.
18. Y. K. Au, H. Lyu, **Y. Quan**,* Z. Xie,* One-Pot Process to Carborano-Coumarin via Catalytic Cascade Dehydrogenative Cross-Coupling. *Chin. J. Chem.* **2020**, *38*, 383–388.
19. **Y. Quan**, Z. Xie,* Controlled Functionalization of *o*-Carborane via Transition Metal Catalyzed B–H Activation. *Chem. Soc. Rev.* **2019**, *48*, 3660–3673.
20. **Y. Quan**, C. Tang, Z. Xie,* Nucleophilic Substitution: A Facile Strategy for Selective B–H Functionalization of Carboranes. *Dalton Trans.* **2019**, *48*, 7494–7498 (Frontier).
21. Y. Chen,[†] Y. K. Au,[†] **Y. Quan**,* Z. Xie,* Copper Catalyzed/Mediated Direct B–H Alkenylation/Alkynylation in Carboranes. *Sci. China Chem.* **2019**, *62*, 74–79 (Cover paper).
22. H. Lyu, **Y. Quan**,* Z. Xie,* Rhodium Catalyzed Cascade Cyclization Featuring B–H and C–H Activation: One-Step Construction of Carborane-Fused *N*-Polyheterocycles. *Chem. Sci.* **2018**, *9*, 6390–6394 (Highlighted in Synfacts).
23. **Y. Quan**, Z. Qiu, Z. Xie,* Transition Metal Catalyzed Selective Cage B–H Functionalization of *o*-Carboranes. *Chem. Eur. J.* **2018**, *24*, 2795–2805 (Concept paper).
24. **Y. Quan**,* H. Lyu, Z. Xie,* Dehydrogenative Cross-Coupling of *o*-Carborane with Thiophenes via Ir-Catalyzed Regioselective Cage B–H and C(sp²)–H Activation. *Chem. Commun.* **2017**, *53*, 4818–4821.
25. H. Lyu, **Y. Quan**,* Z. Xie,* Transition Metal Catalyzed Regioselective B(4)-Halogenation and B(4,5)-Diiodination of Cage B–H Bonds in *o*-Carboranes. *Chem. Eur. J.* **2017**, *23*, 14866–14871 (Hot paper).
26. **Y. Quan**, C. Tang, Z. Xie,* Palladium Catalyzed Regioselective B–C(sp) Coupling via Direct Cage B–H Activation: Synthesis of B(4)-Alkynylated *o*-Carboranes. *Chem. Sci.* **2016**, *7*, 5838–5845 (Highlighted in Synform, *Synform* **2016**, *12*, A177-A179).

Others

27. Y. Chen, H. Lyu, **Y. Quan**, Z. Xie,* Fe-Catalyzed Intramolecular B–H/C–H Dehydrogenative Coupling: Synthesis of Carborane-Fused Nitrogen Heterocycles. *Org. Lett.* **2021**, *23*, 4163–4167.
28. Y. K. Au, **Y. Quan**, Z. Xie,* Palladium-Catalyzed Carbonylative Annulation of 1-Hydroxy-*o*-Carborane and Internal Alkynes via Regioselective B–H Activation. *Chem. Asian J.* **2020**, *15*, 2170–2173.

29. H. Lyu, **Y. Quan**, Z. Xie,* Rhodium-Catalyzed Regioselective Hydroxylation of Cage B–H Bonds of *o*-Carboranes with O₂ or Air. *Angew. Chem., Int. Ed.* **2016**, *55*, 11840–11844.
30. H. Lyu, **Y. Quan**, Z. Xie,* Palladium-Catalyzed Direct Dialkenylation of Cage B–H Bonds in *o*-Carboranes through Cross-Coupling Reactions. *Angew. Chem., Int. Ed.* **2015**, *54*, 10623–10626.
31. J. Zhang, **Y. Quan**, Z. Lin,* Z. Xie,* Insight into Reaction Mechanism of [2 + 2 + 1] Cross-Cyclotrimerization of Carboryne with Alkene and Trimethylsilylaryalkyne Mediated by Nickel Complex. *Organometallics* **2014**, *33*, 3556–3563.
32. Z. Qiu, **Y. Quan**, Z. Xie,* Palladium-Catalyzed Selective Fluorination of *o*-Carboranes. *J. Am. Chem. Soc.* **2013**, *135*, 12192–12195.
33. X. Wu, J. Guo,* **Y. Quan**, W. Jia, D. Jia,* Y. Chen, Z. Xie, Cage Carbon-Substitute Does Matter for Aggregation-Induced Emission Features of *o*-Carborane-Functionalized Anthracene Triads. *J. Mater. Chem. C* **2018**, *6*, 4140–4149.
34. C. Tang, H. Zhang, C. Sun, J. Li, L. Qi, **Y. Quan**, F. Gao,* L. Dong,* An Efficient Strategy for Highly Loaded, Well Dispersed and Thermally Stable Metal Oxide Catalysts. *Catal. Commun.* **2011**, *12*, 1075–1078.

Book Chapter

1. **Y. Quan**, Z. Xie, *Transition-metal-catalyzed Cage B–H Activation and Functionalization of *o*-Carboranes* in *Handbook of Boron Science*; Eds. Hosmane, N. S., Eagling, R., World Scientific Publishing Europe Ltd, **2018**; Vol. 2.

Conferences:

1. **Yangjian Quan**, *Transition Metal Catalyzed Regioselective Cage B-H Activation and Functionalization of *o*-Carboranes*. 16th International Meeting on Boron Chemistry (IMEBORON XVI), July 9-13, 2017, Hong Kong. **Invited Lecture.**
2. **Yangjian Quan**, *Directing Group Guided Transition Metal Catalyzed Carboranyl B-Heteroatom Bond Construction*. 16th Boron Chemistry Meeting in the Americas (BORAM XVI), June 26-30, 2018, Boston, USA. **Oral Presentation.**
3. **Yangjian Quan**, *Transition Metal Catalyzed Direct and Selective B-H Functionalization of *o*-Carboranes via the Directing Group Strategy*. 10th CCS National Organic Chemistry Conference, December 19-21, 2017, Shenzhen, China. **Oral Presentation.**
4. **Yangjian Quan**, *Palladium-catalyzed regioselective diarylation of *o*-carboranes via direct cage B-H activation*. 27th International Conference on Organometallic Chemistry (ICOMC 2016), July 17-22, 2016, Melbourne, Australia. **Oral Presentation.**
5. **Yangjian Quan**, *Transition Metal Catalyzed Regioselective Cage B-H Activation and Functionalization of *o*-Carboranes*. 19th National Symposium on Organometallic Chemistry of China, October 28-31, 2016, Hangzhou, China. **Oral Presentation.**
6. **Yangjian Quan**, *Transition Metal Catalyzed Regioselective Cage B-H Activation and Functionalization of *o*-Carboranes*. CUHK-SUSTech Bilateral Symposium, December 23, 2016, Hong Kong. **Oral Presentation.**