



香港中文大學化學系
Department of Chemistry
THE CHINESE UNIVERSITY OF HONG KONG

The Chinese University of Hong Kong

Department of Chemistry Research Seminar Series



Chiral Cation Catalysis

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11 April 2023 (Tuesday)
3:30 PM
MMW 704

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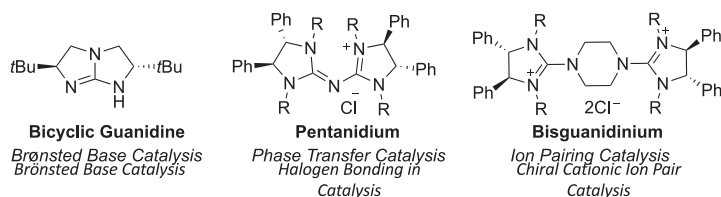
Chiral Cation Catalysis

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Chiral cations have found useful applications as phase transfer catalyst i.e. in partnership with inorganic basic salts such as hydroxides and carbonates for basic reactions. We have over the past decade developed several chiral cation catalysts including pentanidium and bis-guanidinium. Herein, we report three topics related to these chiral cation catalysts. Firstly, we will discuss the role of these catalysts in ion pair catalysis. We will discuss reactions in which they are partnered with polyoxometalates such as tungstate and molybdate. We will also discuss reaction involving hypervalent silicate intermediates. In the second topic, we will discuss how we use these catalysts are used to investigate roles of halogen bonding in catalysis. Lastly, we will explain the desymmetrisation of sulfinates, which provide a route to a range of enantio-enriched sulfur stereogenic centers.



Selected Publications:

D. Leow and C.-H. Tan, Chiral guanidines catalyzed enantioselective reactions, *Chemistry - An Asian Journal*, **2009**, 4, 488 – 507.

T. Ma, X. Fu, C. W. Kee, L. Zong, Y. Pan, K.-W. Huang, C.-H. Tan, Pentanidium catalyzed enantioselective phase transfer conjugate addition reactions, *Journal of the American Chemical Society*, **2011**, 133, 2828 – 2831. (Highlighted by Synfacts 2011, 5, 0556-0556; contributors: Benjamin List, Saihu Liao)

L. Zong, C.-H. Tan, Phase transfer and ion pairing catalysis of pentanidiums and bisguanidiniums, *Accounts of Chemical Research*, **2017**, 50, 842 – 856.

X. Zhang, J. Ren, S. M. Tan, D. Tan, R. Lee, C.-H. Tan, Enantioconvergent Halogenophilic Nucleophilic Substitution (SN2X) Reaction, *Science*, **2019**, 363, 400 – 404.

X. Zhang, Esther C. X. Ang, Z. Yang, C. W. Kee, C.-H. Tan, Synthesis of chiral sulfinates esters by asymmetric condensation, *Nature*, **2022**, 604, 298–303.