Department of Chemistry
香港城市大學
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Special Departmental Seminar

By

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@ Catalysis—A New Horizon In Asymmetric Catalysis

Date: **21 October 2024 (Monday)**

Time: **10:00 am - 11:30 am**

Venue: **G4702 (Green Zone, 4th Floor)**
Yeung Kin Man Academic Building
City University of Hong Kong

For abstract, please refer to the attached sheet.

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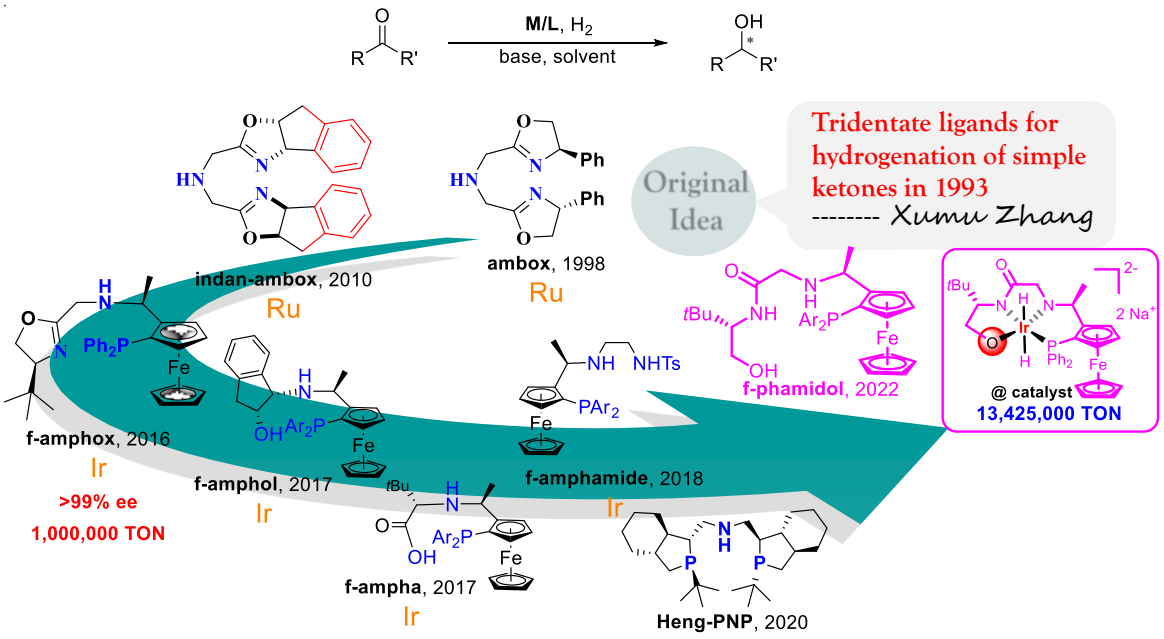
~ All Are Welcome ~

Abstract

Highly efficient and enantioselective hydrogenation is a key generic technology for green drug synthesis. In 2016, Zhang and coworkers creatively introduced ferrocene skeleton into the tridentate ligand and designed and synthesized a new f-amphox ligand, which showed ultra-high activity and enantioselectivity (>1,000,000 TON, 99% ee) in the hydrogenation of ketones. On this basis of amphox, Zhang and coworkers successively developed chiral tridentate ligands f-amphol, f-ampha and f-amphamide based on ferrocene skeleton, as well as electron-rich Heng-PNP based on rigid skeleton. In 2022, Xumu Zhang proposed the concept of ate catalysis (@ catalysis) and a tetradentate ligand based on the ferrocene skeleton, termed as f-phamidol, was developed based on this concept, which can obtain a TON of up to 13,425,000 in asymmetric hydrogenation of ketones. These multidentate ligands have been applied to the green synthesis of many important drugs such as Ezetimibe, Montelukast, Phenylephrine, Nicotine, etc.



References:

[1] Jiang, Y.; Jiang, Q.; Zhang, X.,* *J. Am. Chem. Soc.* **1998**, *120*, 3817-3818.
[2] Yin, C; Jiang, Y.F.; Huang, F.; Xu, C.Q.; Pan, Y.; Gao, S.; Chen, G.Q.; Ding, X.; Bai, S.T.*; Lang, Q.*; Li, J.*; Zhang, X.*, *Nat. Commun.* **2023**, *14*, 3718.
[3] Wang, J.; Shao, P.-L.; Lin, X.; Ma, B.; Wen, J.; Zhang, X.*, *Angew. Chem., Int. Ed.* **2020**, *59*, 18166-18171.
[4] You, Y.; Yin, C.; Xu, L.; Chen, G.-Q.; Zhang, X.* *Green Synth. Catal.* **2024**, *5*, DOI: 10.1016/j.gresc.2024.04.010.

Biography

Professor Zhang Xumu

- Associate Dean of the College of Science
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- Dean of Medi-X, Sustech
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Xumu Zhang received his BS from Wuhan University (1982) and MS from Chinese Science Academy (1985) with Professor Jiaxi Lu and University of California, San Diego (1987) with Professor Gerhard N. Schrauzer. He received his Ph.D. in chemistry in 1992 from Stanford University under the guidance of Professor James P. Collman. He pursued postdoctoral research at Stanford University from 1992 to 1994. Before joining SUSTech in 2015, he was a professor of chemistry in Penn State University and distinguished professor in Rutgers University.

Xumu Zhang is the first person from mainland China, who won the prestigious ACS Cope Scholar Award in 2002 for his invention of the toolbox of chiral ligands for his development of homogeneous catalysts that make it practical to synthesize many chiral molecules, especially those having biological significance. In 2014, a chemical reaction was named after his name as Zhang Enyne Cycloisomerization. In frontier areas of science, Xumu Zhang has applied over 50 U.S. and international patents, published more than 400 papers and the papers are cited over 20000 times. He has developed several privileged, powerful and practical chiral ligands for asymmetric catalysis, which enables promising industrial application in the synthesis drug molecules. Besides, he also founded a biomedical company named “Chiral Quest” in 2000.

His research interests include high efficient and selective hydrogenation and hydroformylation, biomass energy conversion and green synthesis of chiral drugs.