CBC SEMINAR ANNOUNCEMENT

Professor Kazushi Mashima
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Asymmetric Hydrogenation of N-Heteroaromatics by Iridium-Chiral Diphosphine Catalysts

Catalytic asymmetric hydrogenations of prochiral unsaturated compounds including C=C, C=O, and C=N bonds have been intensively investigated in terms of most versatile and environmentally benign processes for creating a chiral carbon center. Asymmetric hydrogenation of N-heteroaromatic compounds has been considered as difficult task because of the resonance stability of such the N-heteroaromatic compounds; recent developments on asymmetric hydrogenation of N-heteroaromatic compounds such as 2-substituted quinolines and quinoxalines, giving the corresponding 1,2,3,4-tetrahydroquinoline and 1,2,3,4-tetrahydroquinoxaline derivatives in high enantioselectivity, have been remarkable and outstanding. Herein, we report asymmetric hydrogenation of 2-substituted quinoxalines 3 using chiral cationic dinuclear triply chloride-bridged iridium complexes \([\{\text{Ir(H)[diphosphine]}\}_{2}(\mu-\text{Cl})_{3}]/\text{Cl}\) \((S)-1a: \text{diphosphine} = (S)-\text{BINAP} ; (S)-2a: \text{diphosphine} = (S)-\text{SEGPHOS})\), and asymmetric hydrogenations and mechanisms of isoquinolinium salts, quinazolinium salts and pyridinium salts are discussed.

(1) Effect of Salt Formation on Asymmetric Hydrogenation of Isoquinolinium Salts Catalyzed by Ir Complex.

(2) Asymmetric Hydrogenation of Quinazolinium Salts Catalysed by Halide-bridged Dinuclear Iridium Complexes bearing Chiral Diphosphine Ligands.

(3) Iridium-catalyzed Asymmetric Hydrogenation of Pyridinium Salts for Constructing Multiple Stereogenic Centers on Piperidines.

(4) Asymmetric Hydrogenation of Isoquinolinium Salts Catalyzed by Chiral Iridium Complexes: Direct Synthetic Protocol for Optically Active 1,2,3,4-Tetrahydroisoquinolines.

(5) Additive Effects of Amins on Asymmetric Hydrogenation of 2-Substituted Quinoxalines Catalyzed by Chiral Iridium Complexes.

Date: 5th August 2015 (Wednesday)
Time: 3:00pm–4:00pm
Venue: NTU SPMS CBC Building Level 2, Conference Room
Host: Assoc Professor Shunsuke Chiba