

CBC SEMINAR ANNOUNCEMENT



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Development of New Catalysts for Organic Synthesis

Part I; Reusable Iridium Catalyst for C-H Borylation

Arylboronates are synthetic intermediates that are used in the synthesis of drugs and functional materials. Among the methods used for their preparation, C-H borylation is one of the most promising because it has high atom efficiency and can be conducted under milder reaction conditions. Recently, we reported the preparation of a recyclable iridium catalyst for the C-H borylation reaction.¹⁾ The iridium catalyst, which can be prepared from an iridium precursor, 2,2'-bipyridine-4,4'-dicarboxylic acid (BPDCA) and bis(pinacolato)diboron, could be reused at least ten times in the borylation of benzene. In this lecture, I will discuss the first continuous-flow C-H borylation system using our new recyclable catalyst.²⁾

Part II; Asymmetric Diels-Alder Reaction Using Danishefsky Diene

Methoxy-3-trimethylsiloxy-1, 3-butadiene (Danishefsky's diene) is recognized as a synthetically useful diene due to its high reactivity in the Diels-Alder reaction with electron-deficient alkenes to give substituted cyclohexenes and cyclohexenones. However, the development of catalytic enantioselective versions of Diels-Alder reactions using Danishefsky's-type dienes with electron-deficient alkenes has been a difficult issue because of the instability of the dienes under Lewis acidic conditions. We have been developed a new chiral ligand, BINAMIDE and BINUREA which are easily prepared from 1,1'-binaphthyl-2, 2'-diamine. The highly diastereo- and enantioselective Diels-Alder reaction of Danishefsky's-type dienes with electron-deficient alkenes in the presence of Yb(III)-BINAMIDE (or BINUREA) complex has been developed. The reaction proceeded *exo*-selective mode and gave chiral highly functionalized cyclohexene derivatives in good yields.^{3, 4)} An asymmetric total synthesis of natural (-)-platyphyllide will be discussed.⁵⁾

1) Tetrahedron Lett. 2009, 50, 6176-6179. 2) Adv. Synth. Cat. 2010, 352, 1662-1666. 3) J. Am. Chem. Soc., 2008, 125, 7484-7485. 4) Tetrahedron Lett. 2009, 50, 5652-5655. 5) J. Org. Chem. 2010, 75, 3871-3874.

Date:	5th June 2012 (Tuesday)
Time:	11:00am – 12:30pm
Venue:	NTU SPMS CBC Building Level 2, Conference Room
Host:	Asst Professor Naohiko Yoshikai