

# Massachusetts Institute of Technology

## Organic Chemistry 5.512

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### Stereocontrolled Conjugate Addition

★ Catalytic Asymmetric Conjugate Addition I: *Unstabilized Nucleophiles*

Hayashi-Miyaura Rh-Catalyzed Conjugate Addition Reactions

Cu-Catalyzed Conjugate Addition of Organozinc and Organomagnesium Compounds

Organocatalytic Conjugate Addition of Activated Aromatic Compounds

★ Catalytic Asymmetric Conjugate Addition II: *Conjugate Reduction*

★ Catalytic Asymmetric Conjugate Addition III: *Stabilized Nucleophiles*

Michael Reactions Using Heterobimetallic Catalysts (Shibasaki)

Organocatalytic Michael Reactions (Jorgensen)

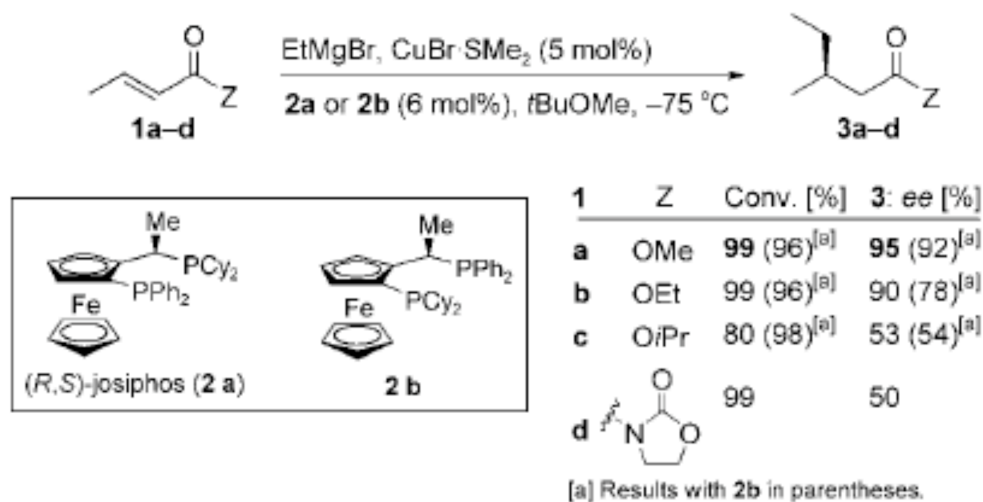
#### Cu-Catalyzed Conjugate Addition of Organozinc Compounds

B. Feringa et al. In *Modern Organocopper Chemistry*; Krause, N., Ed.; Wiley-VCH, 2002, pp 224-258

#### Cu-Catalyzed Conjugate Addition of Organomagnesium Compounds

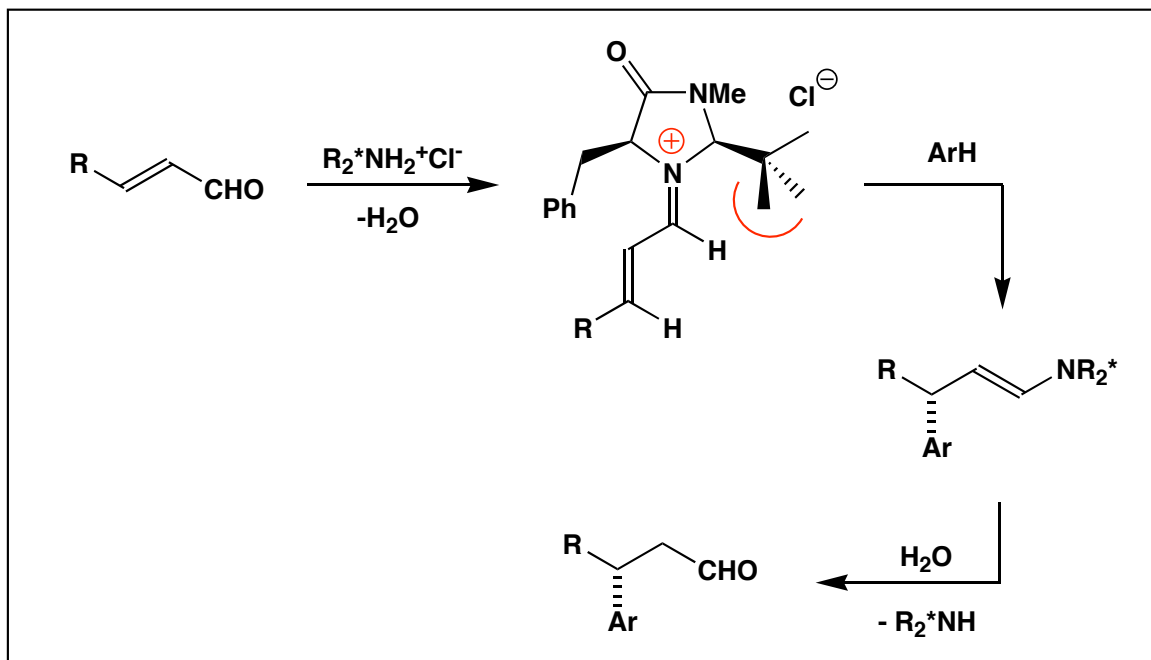
B. Feringa et al.

*Angew. Chem. Int. Ed.* **2005**, 44, 2752 and *J. Am. Chem. Soc.* **2004**, 126, 12784



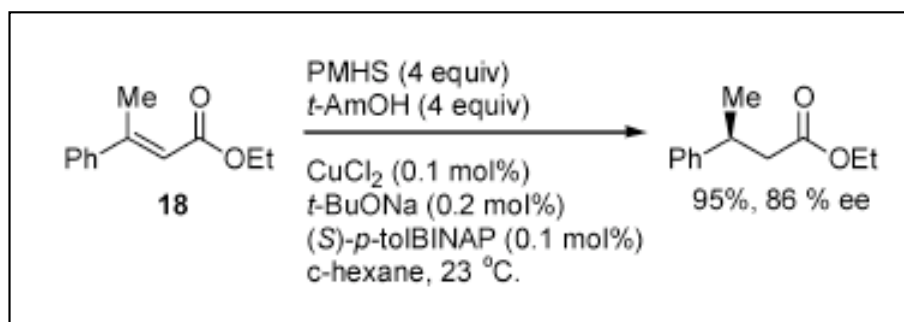
## Organocatalytic Conjugate Addition of Activated Aromatic Compounds

Reviews: See Berkessel and Gröger

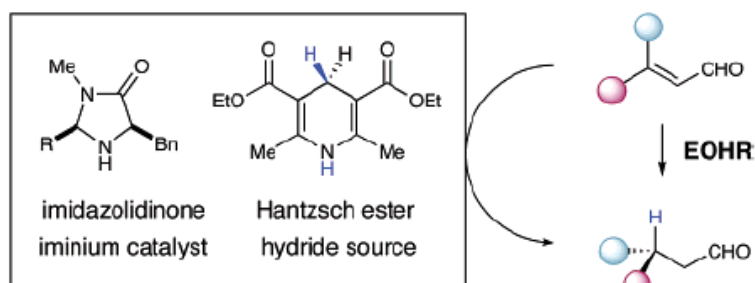


## Catalytic Asymmetric Conjugate Reduction

Buchwald Cu-Catalyzed Conjugate Reduction: *J. Am. Chem. Soc.* **2003**, *125*, 11,253 and refs cited



**Enantioselective Organocatalytic Hydride Reduction (EOHR)**



**EOHR: Origins of Enantiocontrol with Catalyst 2**

