

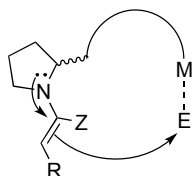
Merging Enamine Catalysis with Hard Metal Lewis Acid Catalysis for Asymmetric Organic Transformations

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The combination of organocatalysis with metal catalysis is an emerging field, aiming to achieve organic transformations that cannot be achieved through organocatalysis or metal catalysis alone. My research group has been engaged in developing new asymmetric reactions through combining enamine catalysis with hard metal Lewis acid catalysis. The biggest challenge in combining enamine catalysis with hard metal Lewis acid catalysis is the acid-base quenching reaction leading to catalyst inactivation. In this talk, I will present two strategies developed in our laboratory to synergistically incorporate enamine catalysis with hard metal Lewis acid catalysis. The first strategy is to use competition coordination to solve the critical acid-base quenching problem; the second strategy is to use the inversion of soft/hard approach to solve the acid-base quenching problem. Using these two strategies, we have developed a number of new asymmetric reactions including inverse-electron-demand asymmetric oxo-Diels-Alder reaction of ketones and multicomponent aza-Diels-Alder reaction of ketones.

Bifunctional enamine/metal Lewis acid catalysis



Synergistic enamine/metal Lewis acid catalysis

