Development of Biocompatible Chiral Lewis Acid Catalysts

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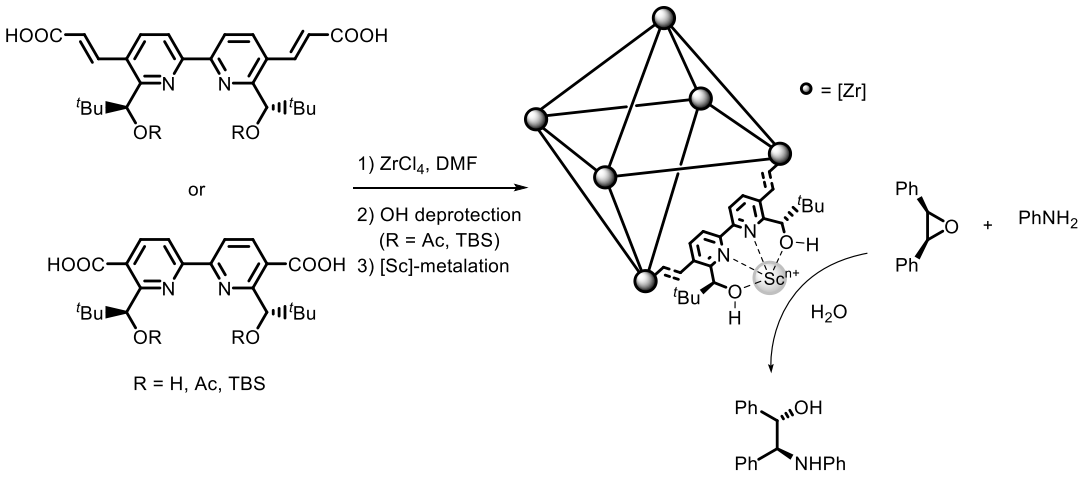
Keywords: Lewis Acid Catalyst; Metal-Organic Framework; Asymmetric Synthesis; Reaction in Water; Biocompatible Reaction

Biocompatible reactions using Lewis acid catalysts are one of the most challenging tasks due to difficulty in controlling non-toxicity and selectivity without providing side reactions in biological environments. Metal-organic frameworks (MOFs) constructed by organic linkers and metal nodes are versatile heterogeneous platforms widely applied in various research fields such as gas storage, chemical sensing, drug delivery, and catalysis. With their high surface area, tunable pore sizes, and stability, MOFs have been appraised as nanodevices in order to protect transition metal ions and suppress undesired interactions with biomolecules.[1] To bridge a gap between Lewis acid catalysts and bioorthogonal chemistry, we report herein the development of immobilized chiral Lewis acid catalysts by engineering chiral 2,2'-bipyridine ligands toward UiO-type MOFs,[2] then post-synthetic complexation with a scandium ion. Applications in asymmetric reactions, for example, ring opening reactions of *meso*-epoxides[3] and further biomimetic catalysis in water using the novel heterogeneous catalysts will be reported.



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