ENANTIOSELECTIVE CONSTRUCTION OF TETRASUBSTITUTED CARBONCENTER VIA CHIRAL PHOSPHORIC ACID-CATALYZED FRIEDEL CRAFTS ALKYLATION

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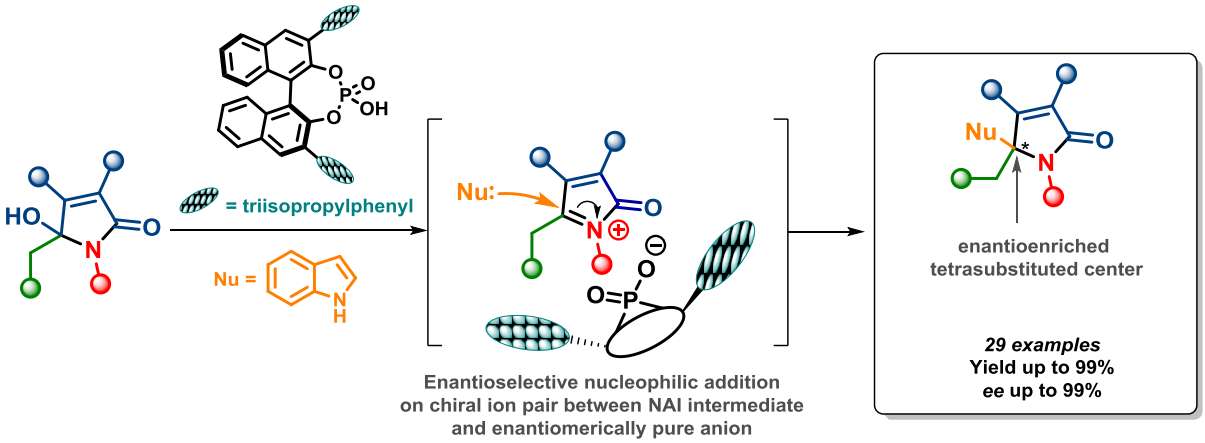
Chirality represents an indefinite challenge that has aroused chemists' interest for decades. In view of the emergence of organocatalysts compounds as powerful tools for asymmetric catalysis, the development of processes involving chiral ion pairs has proven successful. Notably, Asymmetric Counterion-Directed Catalysis (ACDC) is well-known to be an efficient strategy for enantioselective reactions involving cationic species and enantiomerically pure counteranions[1]. More specifically, recognized methodologies for the synthesis of chiral non-racemic C5-functionnalized γ-lactams involve a prochiral 5-membered cyclic N-acyliminium ions (NAI) as cationic intermediates in the presence of chiral phosphoric acid or thiourea compounds.[2] Although this intermolecular enantioselective functionalization is quite well established for the construction of trisubstituted stereocenter-containing pyrrolidinones with high enantiocontrol, the preparation of fully substituted stereogenic center is more challenging and still topic relevant.

Based on the ACDC concept, an enantioselective construction of tetrasubstituted carbon stereocenters *via* chiral phosphoric acid-catalyzed aza-Friedel-Crafts alkylation of indoles with α,β-unsaturated-hydroxylactam is presented herein. Taking advantage of the different interactions between the chiral counteranion and the NAI intermediate, enantioenriched α,β-unsaturated-2-pyrrolidinones containing a carbon tetrasubstituted center are obtained in good yield and excellent enantioselectivities.



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