Ligand-Enabled Pd(0)-Catalyzed Enantioselective C−H Functionalization of Ketene Aminal Phosphates

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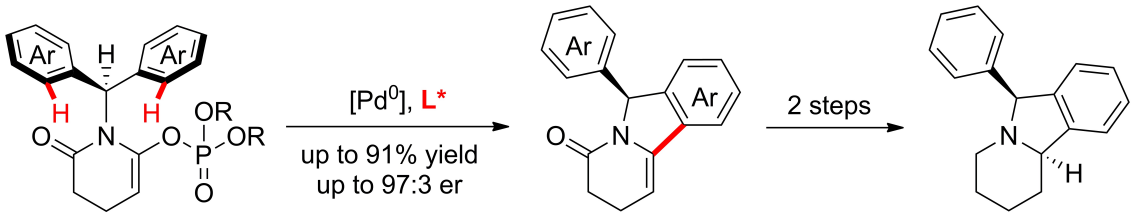
Catalytic C–H functionalizations have emerged as a central theme within organic chemistry.[1] In particular, the stereocontrolled functionalization of C–H bonds is a promising field, as it allows for the rapid generation of structural complexity from simple precursors.[2] Enantioselective Pd(0)-catalyzed C–H arylations and alkenylations have been one of the main focuses in our research group.[3] Whilst aryl and alkenyl triflates have been successfully employed as electrophiles, attempts at using the more elaborate ketene aminal triflates have proven futile due to their instability. In contrast, the corresponding ketene aminal phosphates are readily accessible from cheap and less toxic reagents, exhibit enhanced stability and therefore qualify as potentially suitable starting materials.

Herein, we present Pd(0)-catalyzed enantioselective C–H functionalizations of ketene aminal phosphates toward chiral *N*-heterocycles. A new class of electron-rich phosphine ligands designed for this transformation enabled the synthesis of the desired products in good yields and enantioselectivities. Overall the present reaction allows access to the indolizidine scaffold via a new disconnection.



[1] *C – H Activation*; J.-Q. Yu, Z. Shi, Eds.; Springer-Verlag Berlin Heidelberg, **2010**.
[2] C. G. Newton, S.-G. Wang, C. C. Oliveira, N. Cramer, *Chem. Rev.*, **2017**, DOI 10.1021/acs.chemrev.6b00692.
[3] T. Saget, N. Cramer, *Pure Appl. Chem.*, **2014**, 86, 265-272.