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New Methods For Stereocontrolled Cycloaddition/Dearomatization Reactions Under Catalytic Conditions

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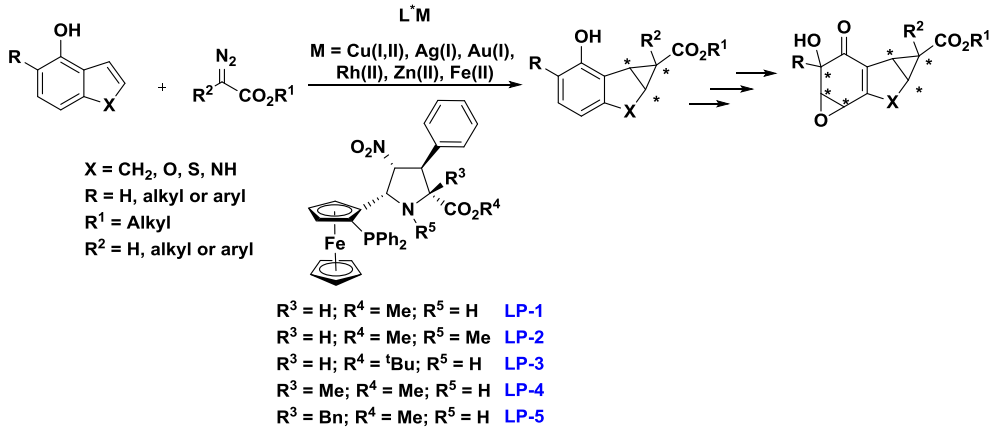
Our group has previously developed ferrocenyl-proline ligands that incorporate planar and central chirality. This feature makes them suitable for a particularly efficient simultaneously chiral induction. In fact, they have shown excellent diastereo- and enantioselectivity in [3+2] cycloaddition reactions between azomethine ylides and electron deficient alkenes.[1] Büchner[2] discovered in 1885 a route for the functionalization of benzene employing diazo compounds to provide a carbene moiety. Since then, the use of diazo compounds has been the most developed method for the metal mediated carbene transfer to C-C double bonds.[3] This reaction provides a very useful method for the convergent formation of cyclopropanes. These [2+1] cycloadducts constitute attractive target molecules in natural products and bioorganic chemistry.[4] In the present work stereoselective [2+1] reactions between fused hetero polyaromatic rings and different diazo compounds are described, in which ligands LP-1 to LP-5 constitute the source of chirality (**Scheme 1**).



Scheme 1. Asymmetric cyclopropanation reaction catalyzed by ferrocenyl-proline-metal complexes followed by oxidative dearomatization.

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