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NEW AXIALLY CHIRAL BIPYRIDINES AND THEIR APPLICATION IN ASYMMETRIC CATALYSIS

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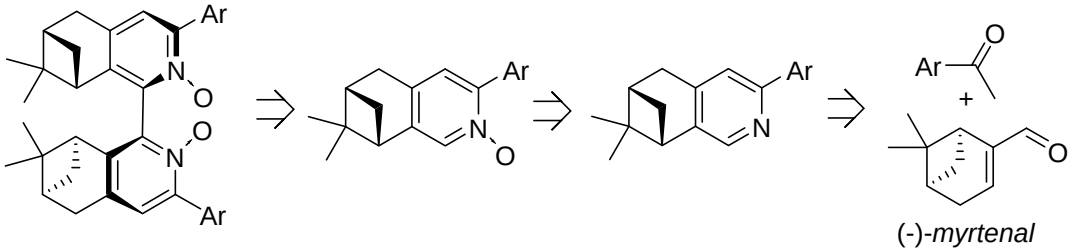
Abstract. Complexes of chiral bipyridines with transition metals have a very rich chemistry including catalytic asymmetric transformations [1]. Additionally, related bypiridine *N*-oxides have made a considerable impact in enantioselective nucleophilic catalysis [2]. Despite these successes, synthesis and application of axially chiral bipyridine derivatives has not reached the level of maturity, which in part is due to the lack of good coupling methods for joining the pyridine units together in a stereoselective fashion.



Herein, we present an expedient mild procedure for coupling of two chiral pyridine-*N*-oxide units, where the central chirality of the terpene fragment efficiently controls formation of the chiral axis [3]. The synthesised bipyridine-*N*-oxides can be reduced to the respective chiral bipyridines with a complete retention of the axial chirality. Several applications of both bis-*N*-oxides and bipyridines in asymmetric transformations will be presented.

Also, we present a novel general strategy for a scalable enantioselective total synthesis of diterpenes isolated from marine soft coral *Pseudopterogorgia elisabethae* exhibit a wide range of useful biological properties [4]. In our synthesis the key stereochemistry defining steps are asymmetric crotylation, anionic oxy-Cope rearrangement and cationic cyclisation [5, 6]. Preliminary biological evaluation of these compounds will be presented.

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