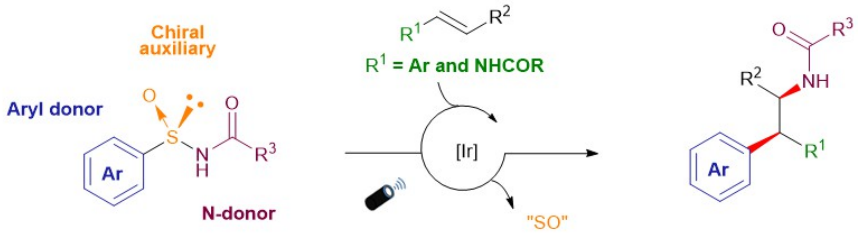
Chiral arylsulfinylamides: *all-in-one* reagents for visible light-mediated asymmetric alkene aminoarylations

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Two- or one-electron mediated difunctionalizations of internal alkenes represent straightforward approaches to assemble molecular complexity by the simultaneous formation of two contiguous Csp^3-stereocenters. While racemic versions have been extensively explored, asymmetric variants, especially those involving open-shell C-centered radical species, are very limited both in number and more importantly, scope.[1,2,3] Recently, our group exploited the ability of chiral N-sulfinyl moieties to impart absolute stereocontrol in the radical mediated transformation to assemble all-C quaternary centers.[4]

Here, we present an asymmetric intermolecular alkene aminoarylation using arylsulfinylamides as multifunctional *all-in-one* reagents featuring a traceless chiral auxiliary.[5] The reaction tolerates a wide variety of N-atom donors and is compatible with both 1,2-disubstituted styrenes, vinyl ethers and vinyl amides thus providing access to valuable *b,b*-diarylethylamines, aryl-*a,b*-ethyleneaminoalcohols, and aryl-*a,b*-ethylenediamines. Excellent levels of both relative and absolute stereocontrol are achieved in the two newly forged stereogenic centers governed by the configuration of the chiral sulfoxide tether. Characterization of the reaction mechanism revealed an interesting dichotomy in the initiation of the photoredox catalytic cycle wherein either electron-rich alkenes or sulfinylamides are preferentially activated at the expense of the Ir photocatalyst.



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[5] Cédric Hervieu, Mariia S. Kirillova, Yawen Hu, Sergio Cuesta-Galisteo, Estíbaliz Merino*, Cristina Nevado*. ChemRxiv. Cambridge: Cambridge Open Engage (2022) This content is a preprint and has not been peer-reviewed.