HYDROXYLAMINE DERIVATIVES AS CLEAN IRON NITRENES PRECURSORS

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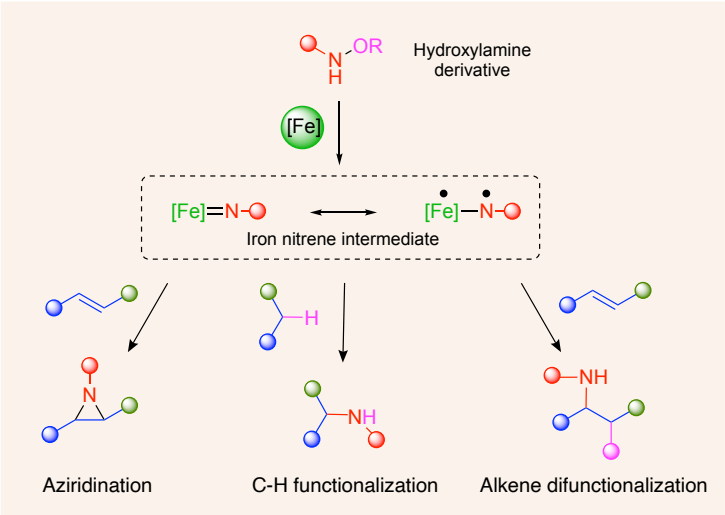
Transition metal-catalyzed nitrene transfer reactions represent a powerful strategy for the formation of nitrogen-containing molecules.[1] Among the years various catalytic systems have been developed, mostly based on rhodium, ruthenium, iridium or copper complexes and relying mainly on iminoiodinanes and azide reagents as nitrene precursors.[2] Despite their good reaction efficiency, the use of those rare and/or toxic transition-metal is problematic. Furthermore, iminoiodinanes liberate stoichiometric amounts of toxic iodobenzene and azides have significant risks of explosion. Conversely, iron associated with hydroxylamine derivatives represent an interesting solution for the development of such new sustainable protocols. The low toxicity of this metal makes it a catalyst of choice, particularly for the pharmaceutical industry. Moreover, the high concentration of iron in the earth's crust guarantees a sustainable access to a large variety of inexpensive salts. Hydroxylamine derivatives are interesting nitrene precursors. In the one hand they can be efficiently synthesized via straightforward and cost-effective preparations from hydroxylamine. In the other hand they are able to generate the metal-nitrene species without addition of external oxidants.
Our research group focuses his efforts on the development of original iron-catalyzed sustainable methods based on the use of valuable hydroxylamine derivatives.[3] we will present our results on aziridination, intra and inter alkene di-functionalization as well as C-H direct functionalization.



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