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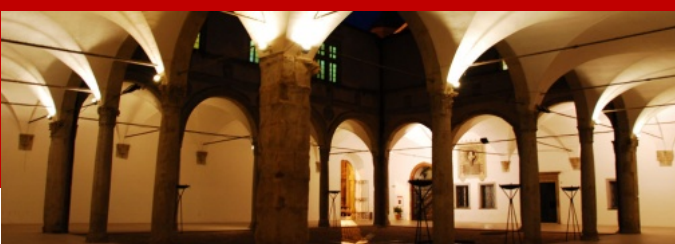
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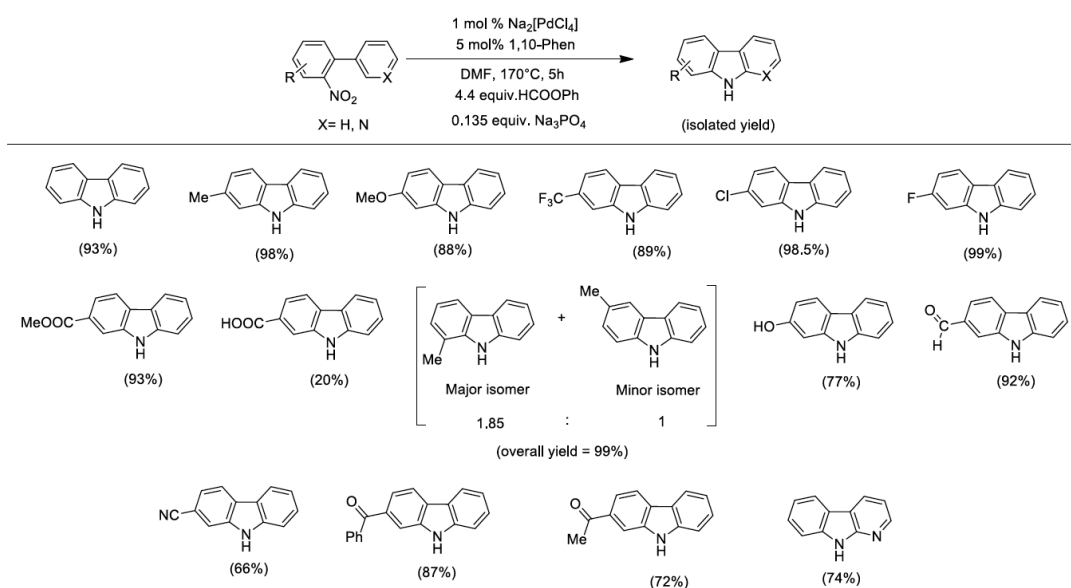


Pd/Phen Catalyzed Synthesis of Carbazoles by Reductive cyclization of 2-Nitrobiaryls: Use of Formate Esters as CO Surrogates

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Palladium complexes with phenanthroline ligands are so far the most effective catalysts for the reductive cyclization of nitroarenes by carbon monoxide to yield a variety of N-heterocyclic compounds.^[1] Despite the high efficiency of many of these reactions, they have not become of widespread use. This is mainly attributed to the need for pressurized CO (requiring specific safety measures). In the aim of turning this kind of reaction into a “general tool” for the synthetic chemist, we developed a procedure based on the use of phenyl formate as an *in situ* source of CO. The reaction can be performed in a glass pressure tube, a cheap equipment accessible to every laboratory. Our previous work was mainly focused on the synthesis of indoles^[2] and oxazines.^[3] However, the application of the previously optimized procedure to the reductive cyclization of 2-nitrobiphenyls to produce carbazoles afforded only moderate yields even under harsher conditions and higher catalyst loadings. Here we report an improved catalytic system and its application to the synthesis of several carbazoles (Scheme 1). In addition, a mechanistic study is in progress to find out whether the metal plays a role in the cyclization step or its role is confined only to deoxygenation of 2-nitrobiphenyl.



Scheme 1. Scope of the reductive cyclization of 2-nitrobiaryls to carbazoles using HCOOPh as CO source.

References

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