L-Shaped Heterobidentate Imidazo[1,5-*a*]pyridin-3-ylidene (N,C)-Ligands for Oxidant-Free Au^{I}/Au^{III} Catalysis

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Kolekcja

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Streszczenie

In the last decade, major advances have been made in homogeneous gold catalysis. However, Au^{I}/Au^{III} catalytic cycle remains much less explored due to the reluctance of Au^{I} to undergo oxidative addition and the stability of the Au^{III} intermediate. Herein, we report activation of aryl halides at gold(I) enabled by NHC (NHC=N-heterocyclic carbene) ligands through the development of a new class of L-shaped heterobidentate ImPy (ImPy=imidazo[1,5-a]pyridin-3-ylidene) N,C ligands that feature hemilabile character of the amino group in combination with strong σ-donation of the carbene center in a rigid conformation, imposed by the ligand architecture. Detailed characterization and control studies reveal key ligand features for Au^{I}/Au^{III} redox cycle, wherein the hemilabile nitrogen is placed at the coordinating position of a rigid framework. Given the tremendous significance of homogeneous gold catalysis, we anticipate that this ligand platform will find widespread application.

Słowa kluczowe

Aryl Halides, Bidentate Ligand Design, Gold Catalysis, N-Heterocyclic Carbene, Oxidant-Free

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