

Gold-catalysed amine synthesis by reductive hydroamination of alkynes with nitroarenes

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Streszczenie

Amines are the most pivotal class of organic motifs in pharmaceutical compounds. Here we provide a blueprint for a general synthesis of amines by catalyst differentiation enabled by triple Au–H/Au⁺/Au–H relay catalysis. The parent catalyst is differentiated into a set of catalytically active species to enable triple cascade catalysis, where each catalytic species is specifically tuned for one catalytic cycle. This strategy enables the synthesis of biorelevant amine motifs by reductive hydroamination of alkynes with nitroarenes. Using this triple cascade approach, we have achieved exceptional functional group tolerance, enabling the use of bulk chemical feedstocks as coupling partners for the amination of both simple and complex alkynes (>100 examples), including those derived from pharmaceuticals, peptides and natural products (>30 examples). The isolation and full crystallographic characterization of gold hydride and hydride-bridged gold complexes has garnered insights into the catalyst differentiation process of fundamental organometallic gold hydride complexes.

Słowa kluczowe

Catalytic mechanisms, Synthetic chemistry methodology

Adres publiczny

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