Category

Organo- and Biocatalysis

Key words

photocatalysis

pyridine synthesis

hypervalent iodine reagents

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Radical 6-*Endo* Addition Enables Pyridine Synthesis under Metal-Free Conditions

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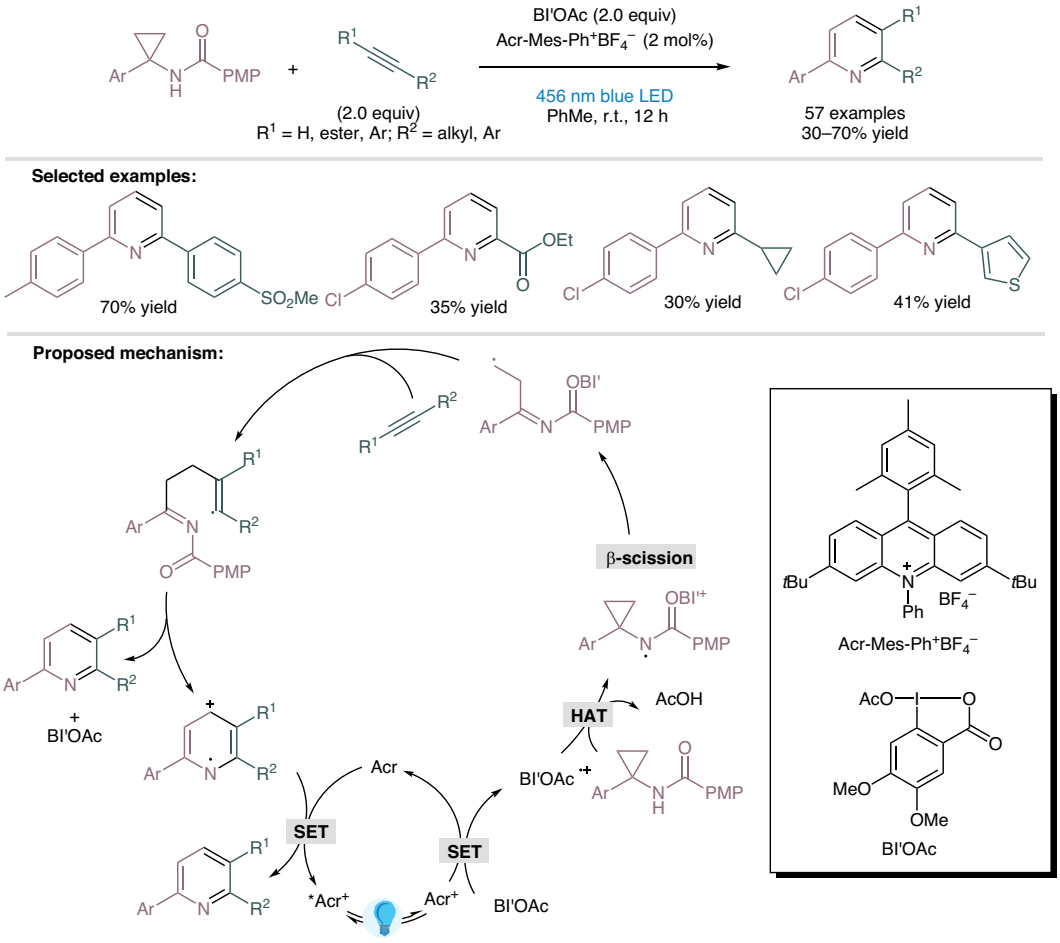
Pyridine Synthesis via Unprecedented 6-*endo*-Cyclization of Cyclopropylamides with Alkynes



Significance: Xue, Chen and co-workers have developed a method to synthesize pyridines from cyclopropylamides and alkynes via formal insertion of alkynes into the cyclopropyl moiety of the amide by employing an acridinium-based photocatalyst and a hypervalent iodine reagent. A broad scope of products was achieved in moderate to good yields featuring high functional group tolerance. Additionally, the synthetic potential was demonstrated by late-stage functionalization of complex bioactive molecules and natural products.

Comment: Late-stage synthesis of pyridines from complex molecules poses the challenge of functional group compatibility and chemoselectivity while employing traditional two-electron processes. This work is the first example of a 6-*endo* radical cyclization to synthesize substituted pyridines. The key solutions for overcoming the inherent preference for the 5-*exo* cyclization are the use of the hypervalent iodine reagent, which upon coordination increases electron density at the imine carbon, and of substituted cyclopropyl amides as substrates.

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