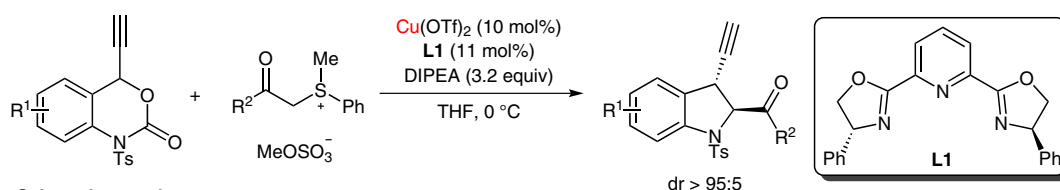
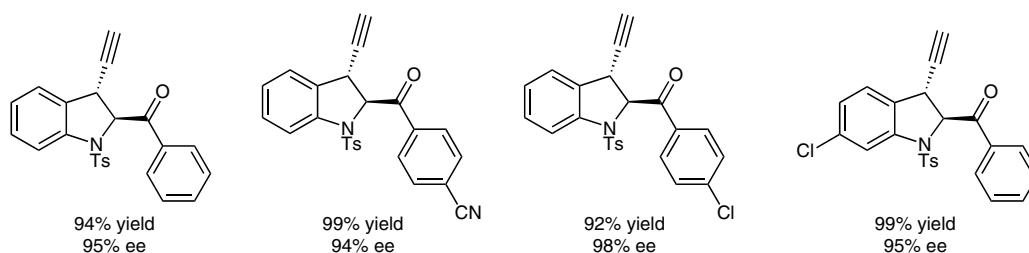


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 Catalytic Asymmetric [4 + 1] Annulation of Sulfur Ylides with Copper–Allenylidene Intermediates
J. Am. Chem. Soc. **2016**, *138*, 8360–8363.

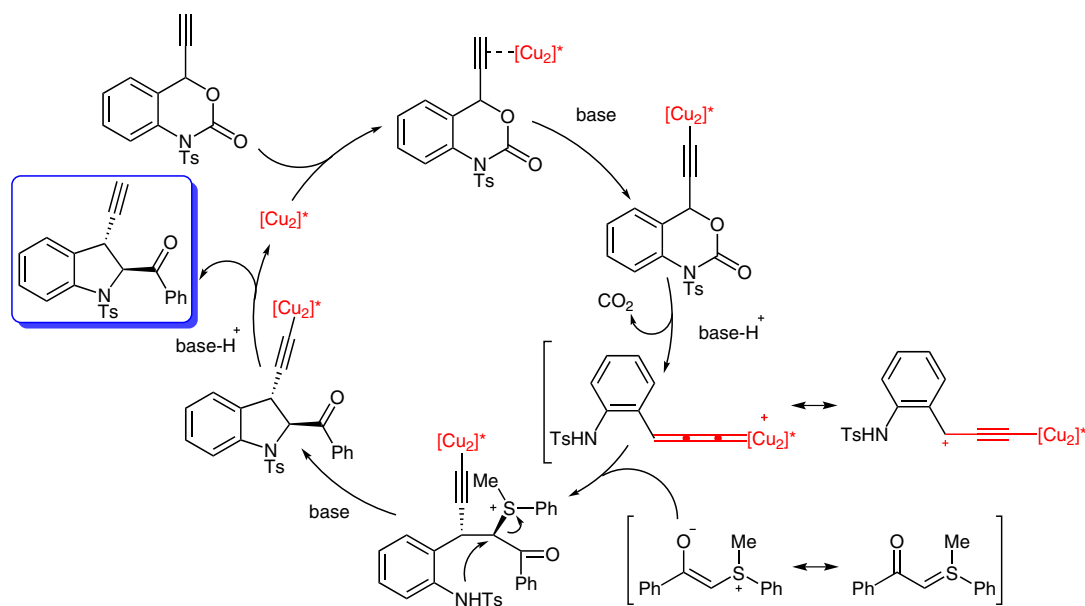
Copper-Catalyzed Asymmetric [4+1] Annulation of Sulfur Ylides



Selected examples:



Plausible mechanism:



Significance: The authors report a copper-catalyzed asymmetric [4+1] cycloaddition by trapping copper–allenylidene dipolar intermediates with sulfur ylides. A variety of chiral indolines were obtained with high stereoselectivities ($\leq 98\%$ ee and dr > 95:5).

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Comment: This reaction affords an opportunity for the ready synthesis of chiral indoline products and related cycloadducts with high stereoselectivities. Mechanistic studies suggest that this reaction is a sequential process that involves decarboxylative propargylation/ S_N2 reactions promoted by binuclear copper complexes.