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

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 (≥98% ee and dr > 95:5).

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.