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).

SYNFACTS Contributors: Hisashi Yamamoto, Masahiro Sai
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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/ $\text{S}_{\text{N}}2$ reactions promoted by binuclear copper complexes.

Category

Metal-Catalyzed
Asymmetric
Synthesis and
Stereoselective
Reactions

Key words

[4+1] annulation
sulfur ylides
copper catalysis
indolines

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