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## SYNFACTS Highlights in Current Synthetic Organic Chemistry

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J. C. HETHCOX, S. E. SHOCKLEY, B. M. STOLTZ\* (CALIFORNIA INSTITUTE OF TECHNOLOGY, PASADENA, USA) Enantioselective Synthesis of Vicinal All-Carbon Quaternary Centers via Iridium-Catalyzed Allylic Alkylation Angew. Chem. Int. Ed. **2018**, *57*, 8664–8667.

## Iridium-Catalyzed Enantioselective Allylic Alkylation



 $\begin{array}{l} \textbf{Reaction conditions: a)} \ \text{RhCl}(\text{PPh}_3)_3, \ \text{H}_2 \ (\text{balloon}), \ \text{benzene, } 23 \ ^\circ\text{C}, \ 18 \ \text{h}, 92\% \ \text{yield; b)} \ \text{O}_3, \ \text{pyridine, } \ \text{CH}_2\text{Cl}_2, \ -78 \ ^\circ\text{C}, \ 4 \ \text{min, ii.} \ p\text{-}\text{TsOH, } \ \text{benzene, reflux, } 18 \ \text{h}, \ 47\% \ \text{yield; d)} \ \text{NaOH, EtOH-H}_2\text{O} \ (1:1), \ 60 \ ^\circ\text{C}, \ 18 \ \text{h}, \ 38\% \ \text{yield, } \ \text{d} = 1:11; \ \text{e}) \ \text{i.} \ \text{O}_3, \ \text{MOH, } \ -78 \ ^\circ\text{C}, \ 5 \ \text{h}, \ \text{ii.} \ \text{NaBH}_4, \ 0 \ ^\circ\text{C}, \ 3 \ \text{h}, \ 65 \ \% \ \text{yield, } \ \text{d} = 1:2.5 \ \text{model} \ \text{MoH, } \ \text{model} \ \text{MoH, } \ \text{model} \ \text{CH}_2 \ \text{Cl}_2, \ \text{Ch}_3, \ \text{MoH, } \ \text{model} \ \text{MoH, } \ \text{model} \ \text{model} \ \text{model} \ \text{model} \ \text{model} \ \text{MoH, } \ \text{model} \ \text{MoH, } \ \text{model} \ \text{model} \ \text{MoH, } \ \text{model} \ \text{model} \ \text{model} \ \text{model} \ \text{MoH, } \ \text{model} \$ 

**Significance:** Enantioselective construction of allcarbon quaternary stereocenters is a formidable challenge in organic chemistry. Stoltz and coworkers report the first enantioselective iridiumcatalyzed allylic alkylation to give acyclic products bearing vicinal all-carbon quaternary centers. Moreover, the allylic alkylation products can be transformed into various valuable and densely functionalized building blocks in a chemo- and diastereoselective way.

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Category

Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

## Key words

iridium catalysis

enantioselectivy

quaternary stereocenters

allylic alkylation

**Comment:** The present iridium-catalyzed allylic alkylation reaction proceeds with excellent yields and enantioselectivities with various malononitrilederived nucleophiles and allylic electrophiles. The catalyst prepared from  $[Ir(cod)Cl]_2$ ,  $(S_a)$ -L, and 1,5,7-triazabicyclo[4.4.0]dec-5-ene (TBD) in the presence of DABCO and triethylborane furnished the allylic alkylation products.