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# SYNFACTS Highlights in Current Synthetic Organic Chemistry



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Enantioselective Synthesis of Vicinal All-Carbon Quaternary Centers via Iridium-Catalyzed Allylic Alkylation
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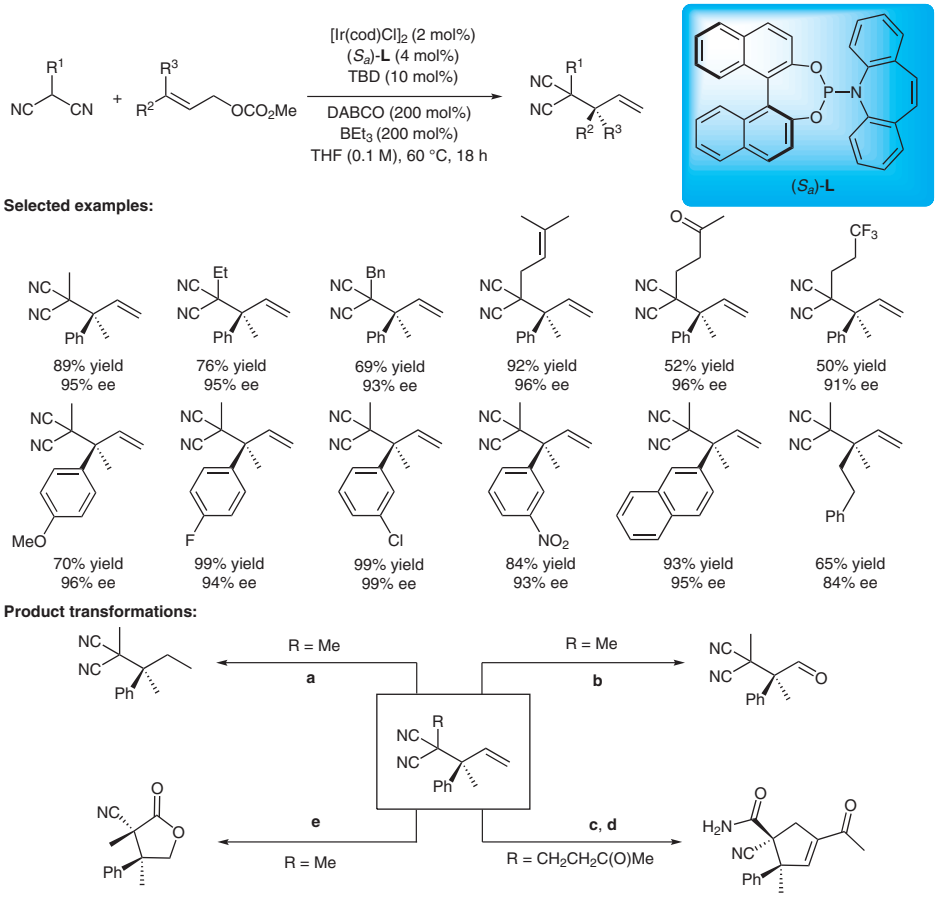
# Iridium-Catalyzed Enantioselective Allylic Alkylation




**Reaction conditions: a**) $RhCl(PPh_3)_3$, $H_2$ (balloon), benzene, 23 °C, 18 h, 92% yield; **b**) $O_3$, pyridine, $CH_2Cl_2$, –78 °C, 4 min, 93% yield; **c**) i. $O_3$, pyridine, $CH_2Cl_2$, –78 °C, 4 min, ii. *p*-TsOH, benzene, reflux,18 h, 47% yield; **d**) NaOH, EtOH–$H_2O$ (1:1), 60 °C, 18 h, 38% yield, dr = 1:11; **e**) i. $O_3$, MeOH, –78 °C, 0.5 h, ii. $NaBH_4$, 0 °C, 3 h, 65 % yield, dr = 1:2.5

**Significance:** Enantioselective construction of all-carbon quaternary stereocenters is a formidable challenge in organic chemistry. Stoltz and co-workers report the first enantioselective iridium-catalyzed 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.

**Comment:** The present iridium-catalyzed allylic alkylation reaction proceeds with excellent yields and enantioselectivities with various malononitrile-derived 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.

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**Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions**

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**quaternary stereocenters**
**allylic alkylation**