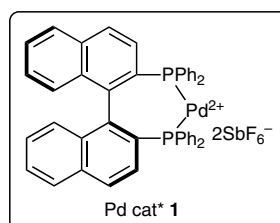
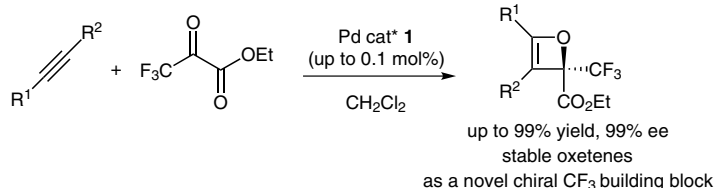


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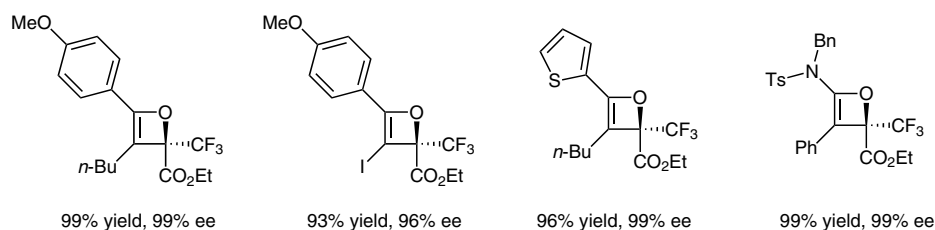
Catalytic Asymmetric Synthesis of Stable Oxetenes via Lewis Acid Promoted [2+2] Cycloaddition

*J. Am. Chem. Soc.* **2011**, *133*, 20092–20095.

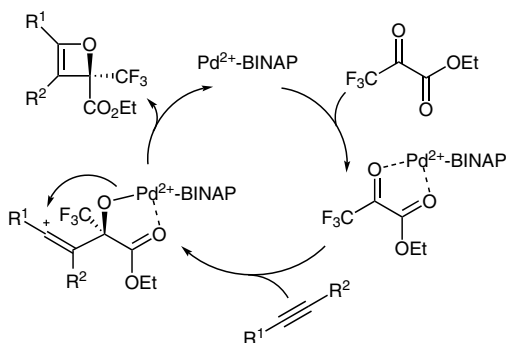
# Asymmetric Synthesis of Stable Oxetenes via [2+2] Cycloaddition



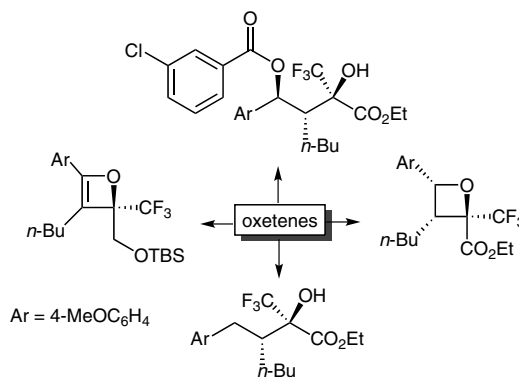
## Selected examples:



## Proposed reaction mechanism:



## Transformation of oxetenes:



**Significance:** The synthesis of stable oxetenes remains a challenging task due to the increased ring strain imposed by a double bond in the ring. Herein, the authors present the first highly enantioselective synthesis of stable oxetene derivatives via an atom-economical [2+2] cycloaddition of various alkynes with trifluoropyruvate using the chiral dicationic palladium complex **1** as an efficient Lewis acid catalyst.

**Comment:** This method efficiently constructs stable oxetene derivatives bearing a CF<sub>3</sub> group. The reactions proceed in excellent enantioselectivity and yields at up to 0.5 mmol scales with very low catalyst loading (0.1 mol%). The products can serve as novel chiral CF<sub>3</sub> building blocks for pharmaceuticals and agrochemicals, and can be further converted into a variety of chiral CF<sub>3</sub>-containing compounds with excellent stereoselectivity.

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Category

Metal-Catalyzed  
Asymmetric  
Synthesis and  
Stereoselective  
Reactions

Key words

oxetenes  
[2+2] cycloaddition  
BINAP

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*of the month*