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Direct Synthesis of Z-Alkenyl Halides through Catalytic Cross-Metathesis
Nature 2016, 531, 459–465.

Molybdenum Complex Catalyzed Z-Selective Cross-Metathesis

Category

Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

Key words

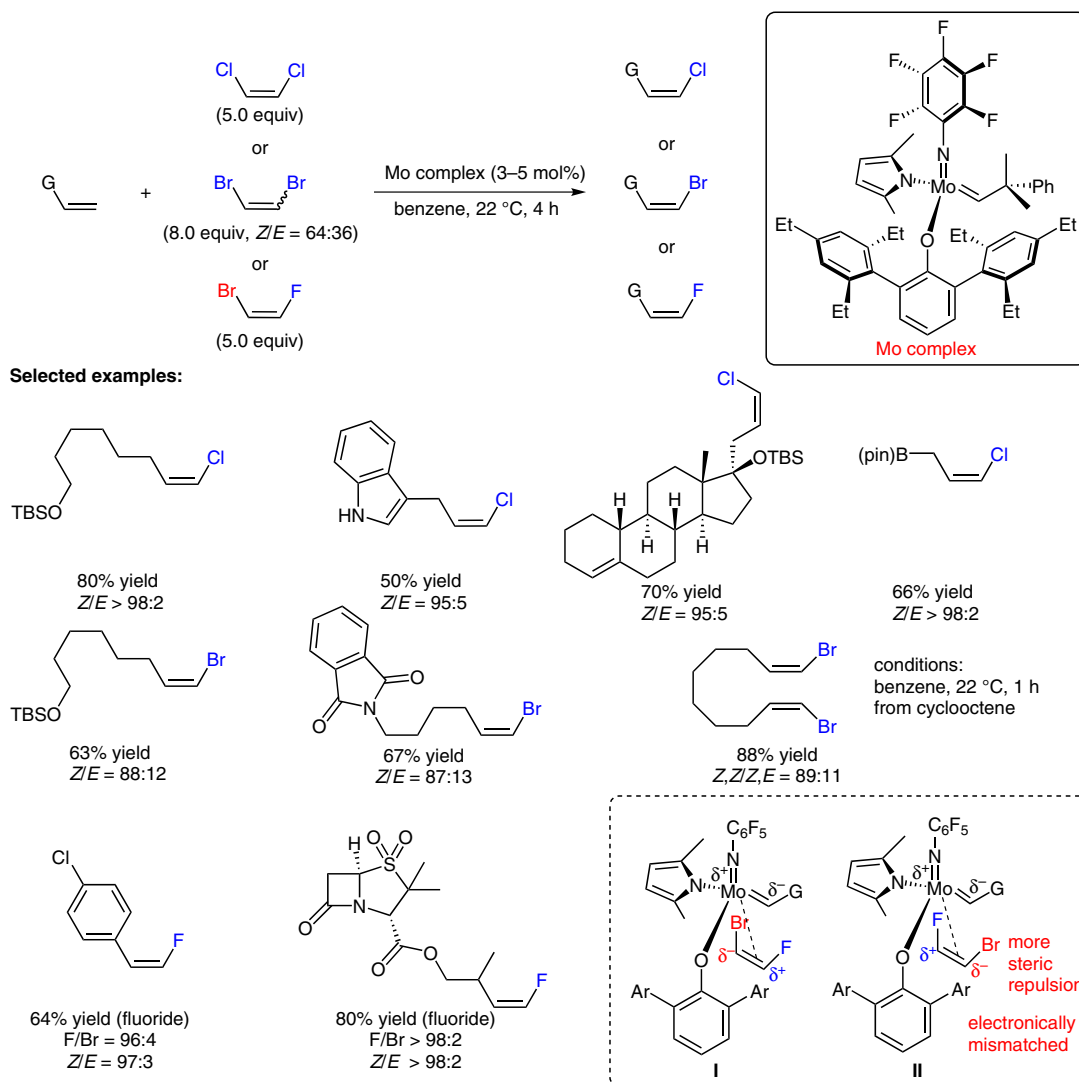
molybdenum catalysis

cross-metathesis

stereoselectivity

haloalkenes

Synfact
of the month



Significance: Cross-metathesis with alkenyl halides is a highly challenging problem. The authors have developed a molybdenum alkylidene species that reacts with alkenyl halides to afford various bromo-, chloro-, or fluoroalkenes with high Z-selectivities. The synthesis of biologically active compounds is also demonstrated.

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Comment: Commercially available (Z)-1-bromo-2-fluoroethene can be used as a fluoride source, instead of vinyl fluoride or (Z)-1,2-difluoroethene, which are difficult to handle. The authors suggest that, for steric and electronic reasons, the reaction with (Z)-1-bromo-2-fluoroethene proceeds through intermediate I.