Diastereoselective [4+4] Cycloadditions

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Regio- and Diastereoselective Iron-Catalyzed [4+4]-Cycloaddition of 1,3-Dienes


Significance: Chirik and co-workers report a regio- and diastereoselective iron-catalyzed [4+4]-cycloaddition of 1,3-dienes, leading to various substituted cyclooctadienes in excellent yields.

Comment: Remarkably, with the choice of the iron catalyst, the cyclodimerization can be controlled in a diastereoselective fashion. Extensive mechanistic studies were performed and catalytically relevant iron complexes were isolated and characterized.

Selected examples:

89% yield
A:B = 93:7

100% yield
A:B = 1:99

81% yield
A:B = 89:11

65% yield
A:B = 2:98

Selected examples:

80% yield
C:D = 94:6

100% yield
C:D = 95:5

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