Diastereoselective [4+4] Cycloadditions

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:

- **A**: 89% yield, \(A:B = 93:7\)
- **B**: 100% yield, \(A:B = 1:99\)
- **C**: 81% yield, \(A:B = 89:11\)
- **D**: 65% yield, \(A:B = 2:98\)

Activator: Mg(C(4)H6) \(\cdot\) 2THF, MeMgCl or Mg

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