Ruthenium-Catalyzed Cycloaddition of Benzocyclobutenones with Diols

Selected examples:

- 88% yield, dr > 20:1
- 82% yield, dr > 20:1
- 89% yield, dr > 20:1
- 95% yield, dr > 20:1
- 64% yield, dr > 20:1
- 82% yield, dr > 20:1
- 86% yield, dr > 20:1
- 61% yield, dr > 20:1

Proposed mechanism:

Significance: The authors have reported intermolecular cycloadditions through formal insertion of saturated C–H bonds into C–C σ-bonds. A ruthenium(0)/dppp complex catalyzed the diastereoselective coupling reactions of benzocyclobutenones to adjacent saturated carbon centers in diols.

Comment: The cycloaddition via ruthenacycles from the benzocyclobutenones and dehydrogenation of the alcohols provides a convergent method for the construction of type II polyketide substructures.