

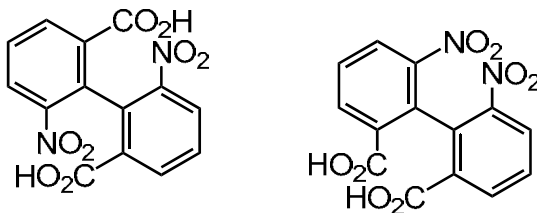
Atropisomers: Biaryl coupling and Approaches to Chiral Birayls

Ian Romaine Oct 29,2009

- What are Atropisomers
- Nomenclature of Atropisomers
- Ullman Couplings
- One electron coupling
- Oxidative Copper couplings
- Other Approaches to Chiral biaryls

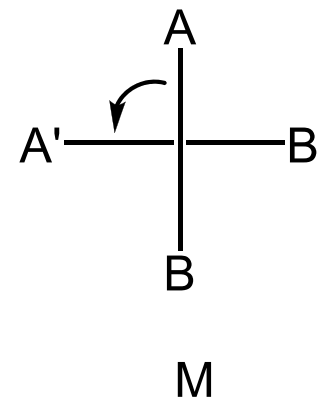
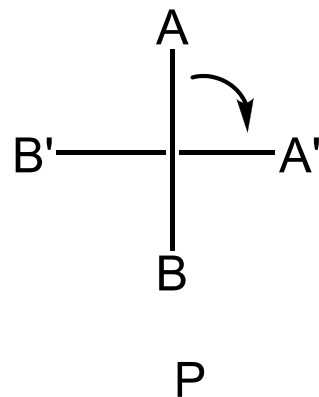
What are Atropisomers

- Atropisomers result from hindered rotation about single bonds . Axial Chirality
- First Isolated Atropisomers in 1922

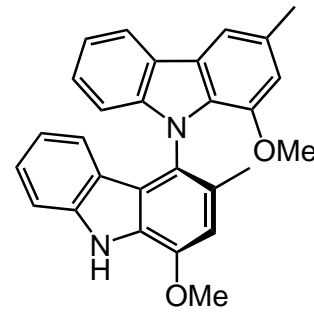
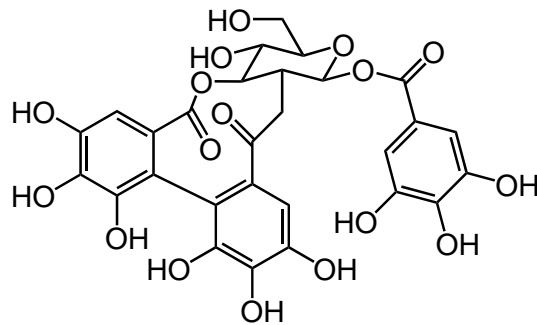
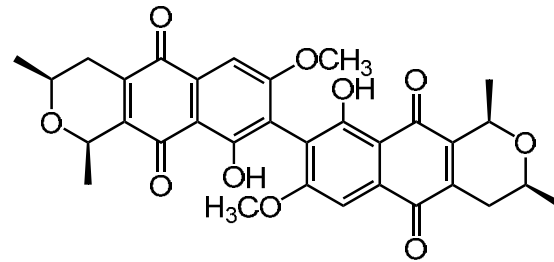
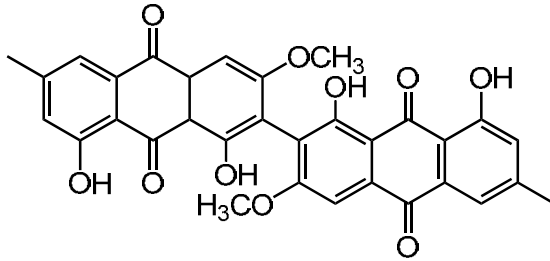
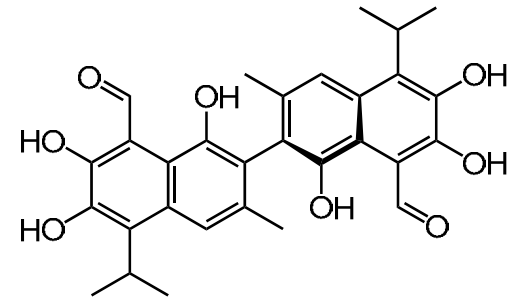
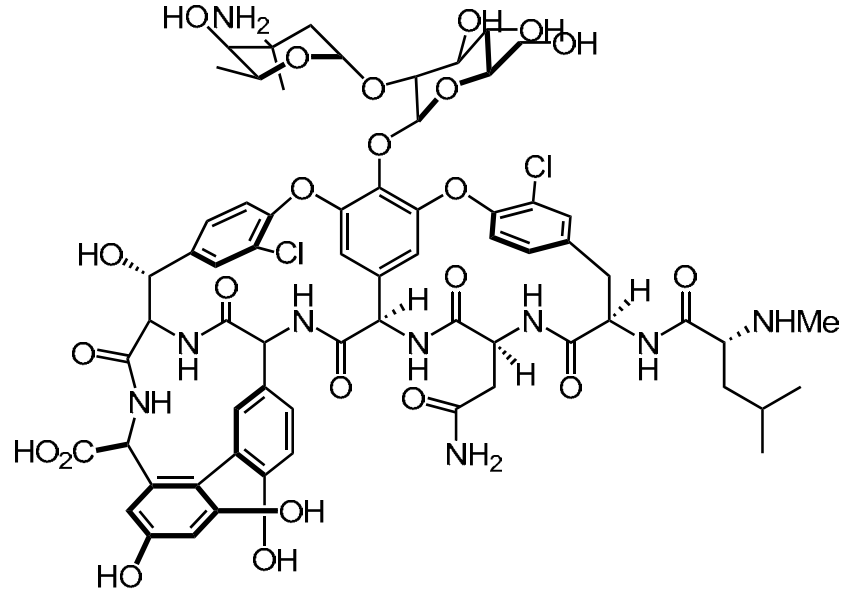


- Atropisomers are detectable by NMR if half lives exceed 10^{-2} sec
- Atropisomers are isolatable if the half life is above 1000 sec

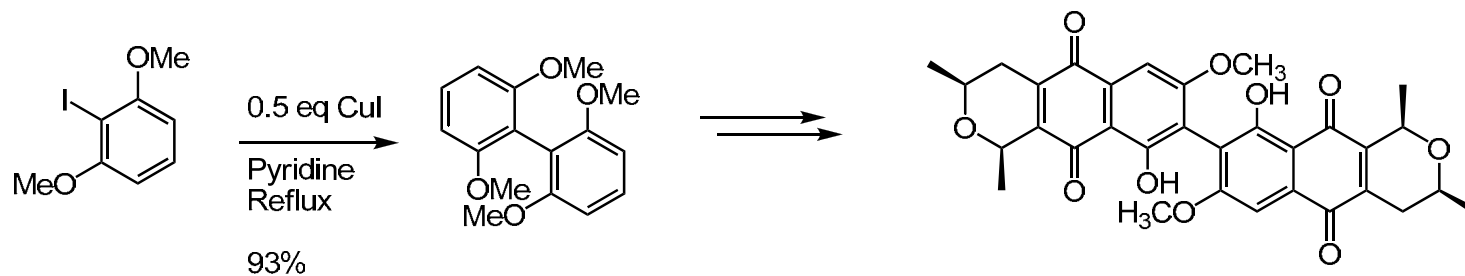
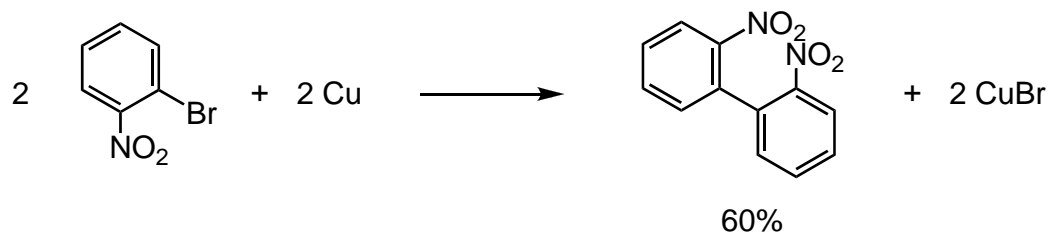
Nomenclature of Atropisomers



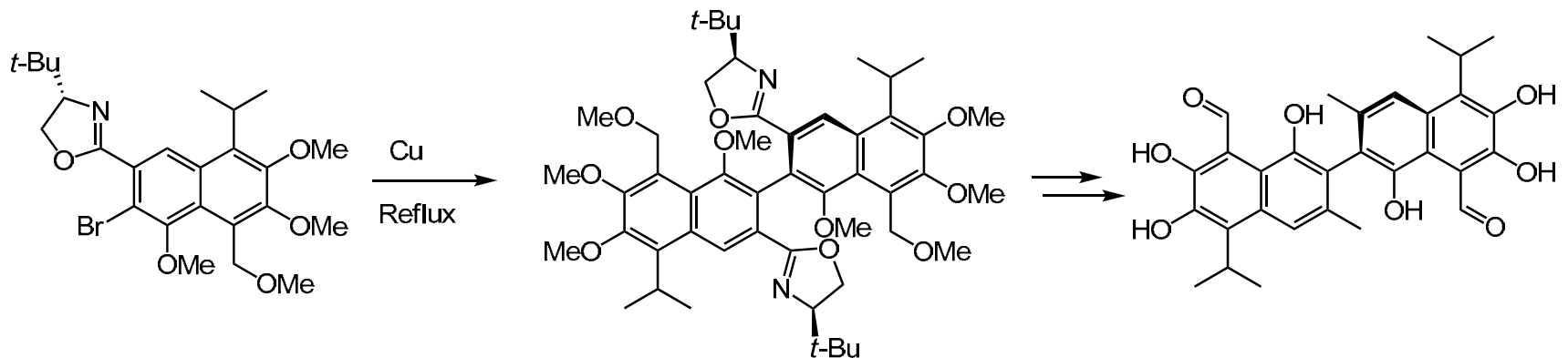
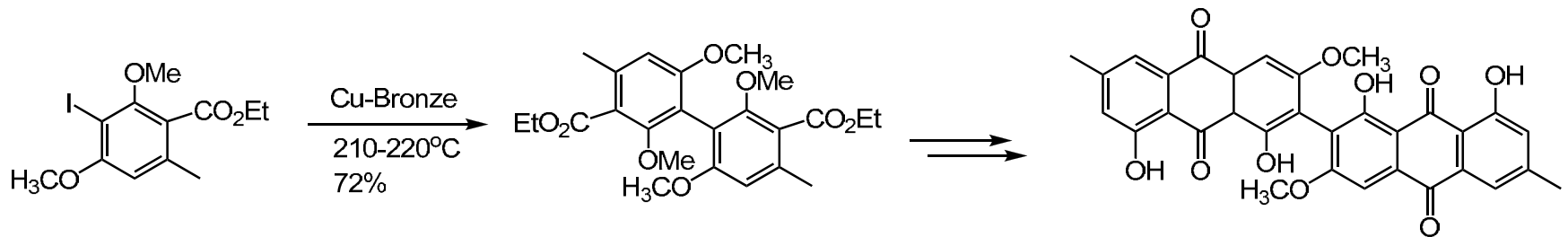
Atropisomers in Natural Products



Ullman Coupling



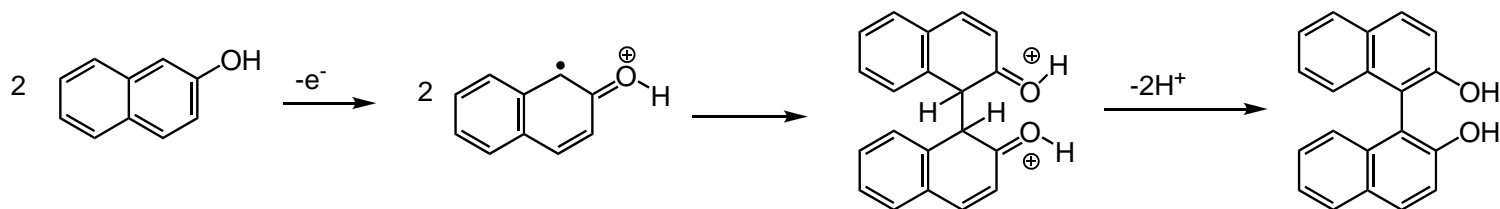
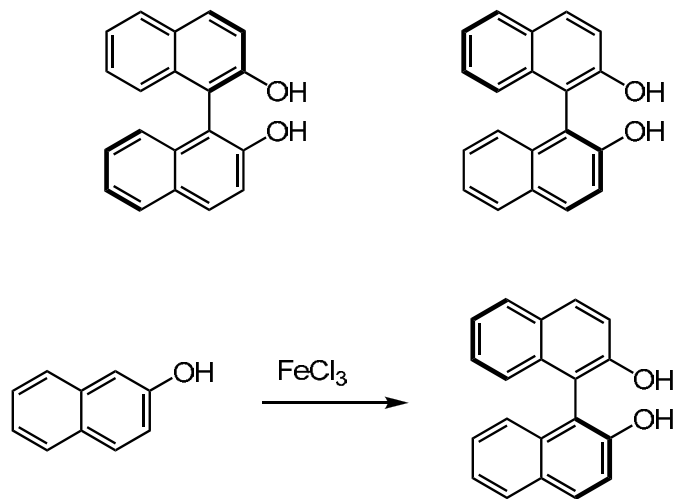
Ullman Coupling

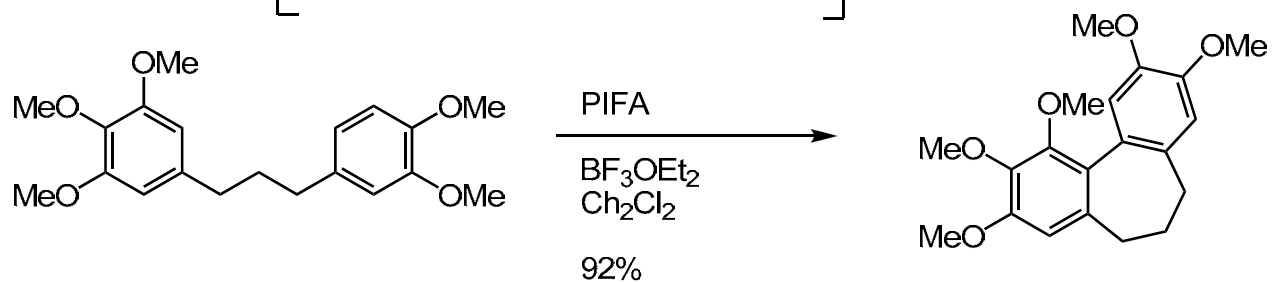
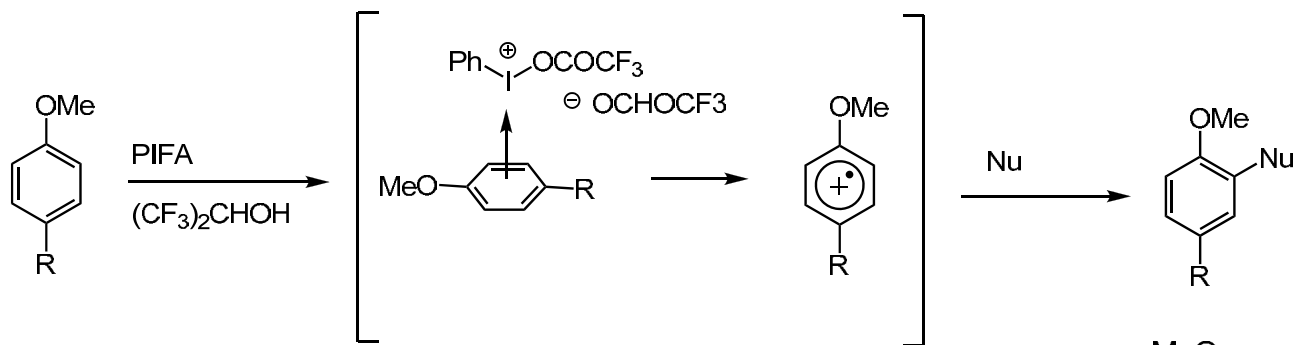
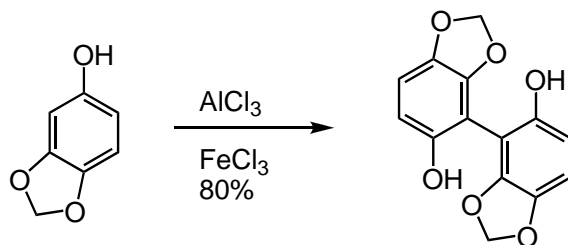


Hauser, F. M.; Gauvan, P. J. *Org. Lett.* **1999**, 4, 671-672.

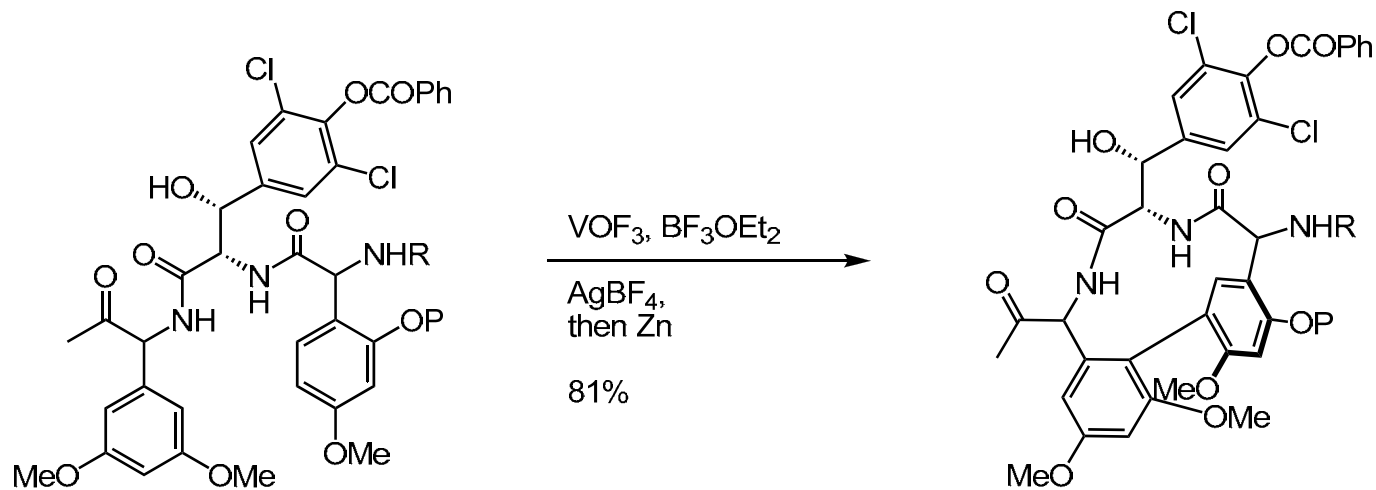
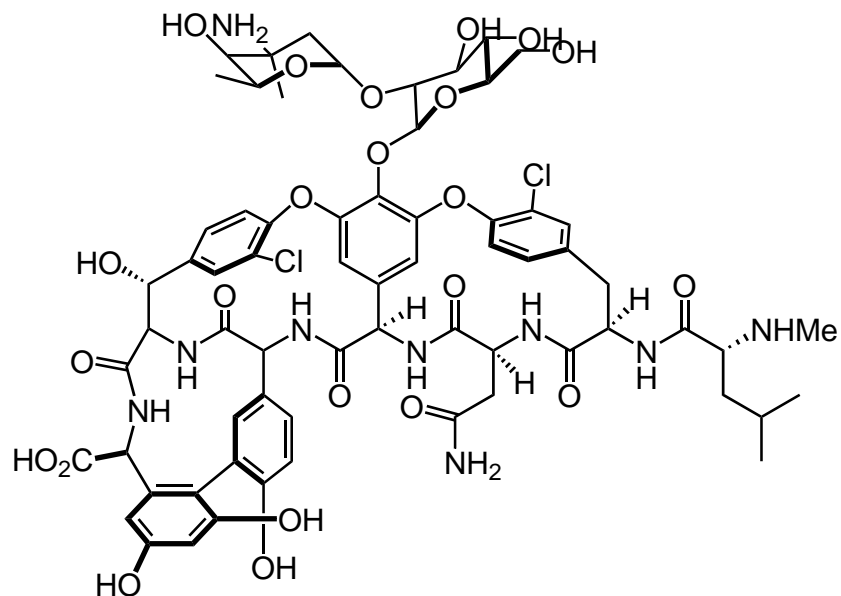
Meyers, A. I.; Willemsen, J. J. *Chem. Comm.* **1997**, 1573-1574.

One Electron Coupling

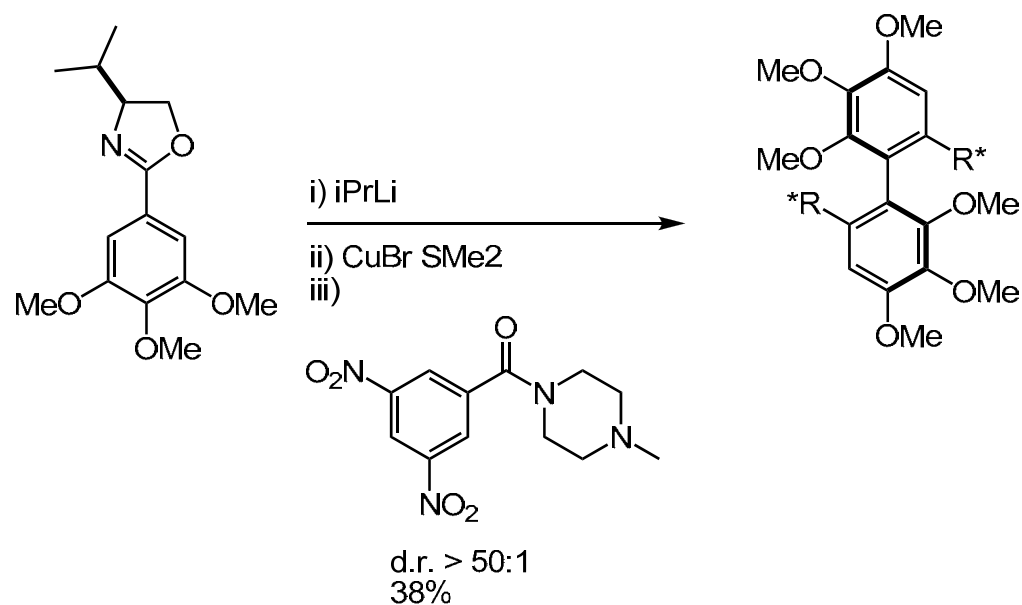
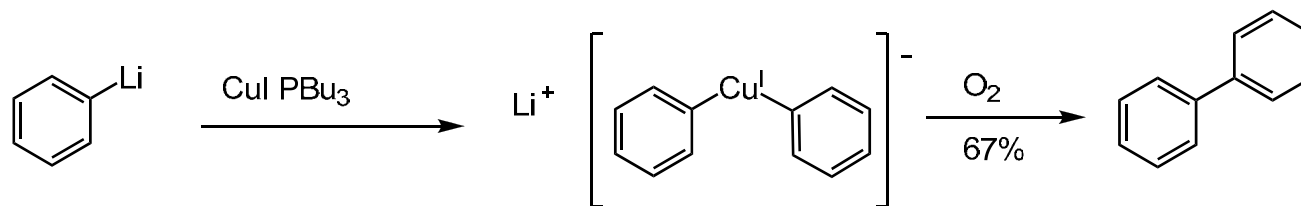


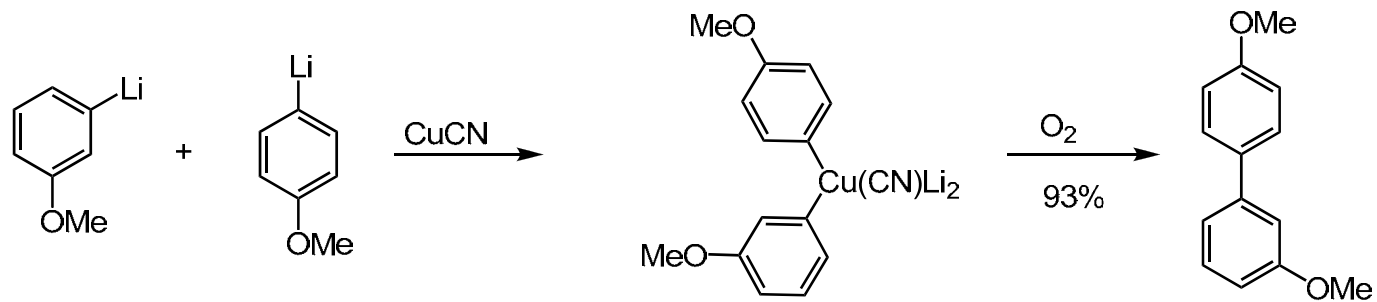


Vancomycin

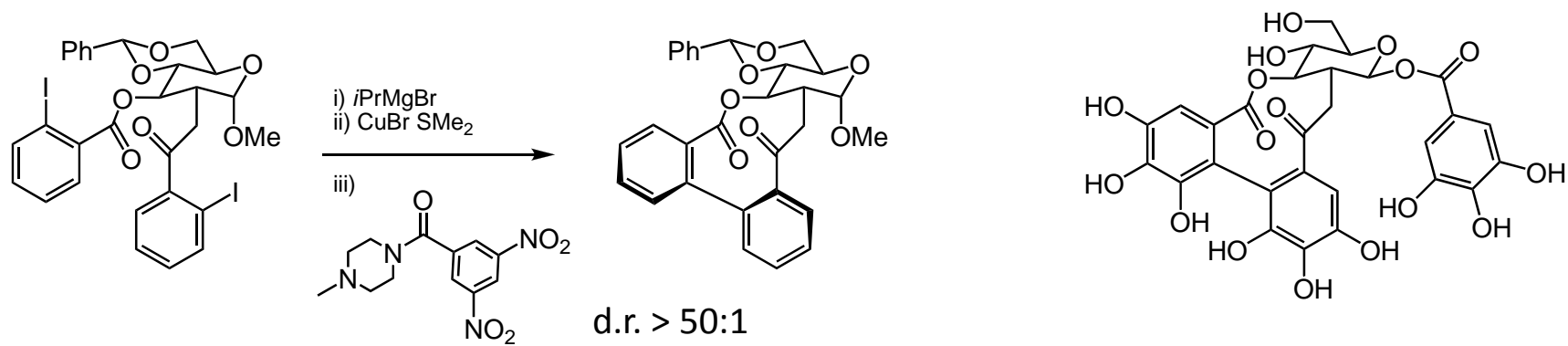


Oxidation of Organocuprates



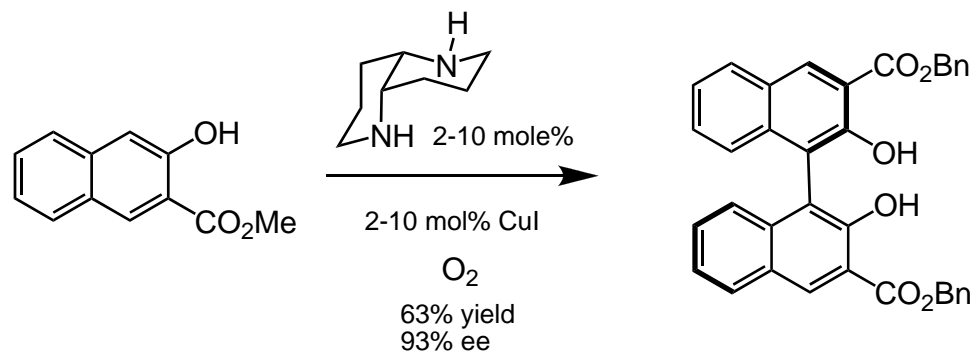
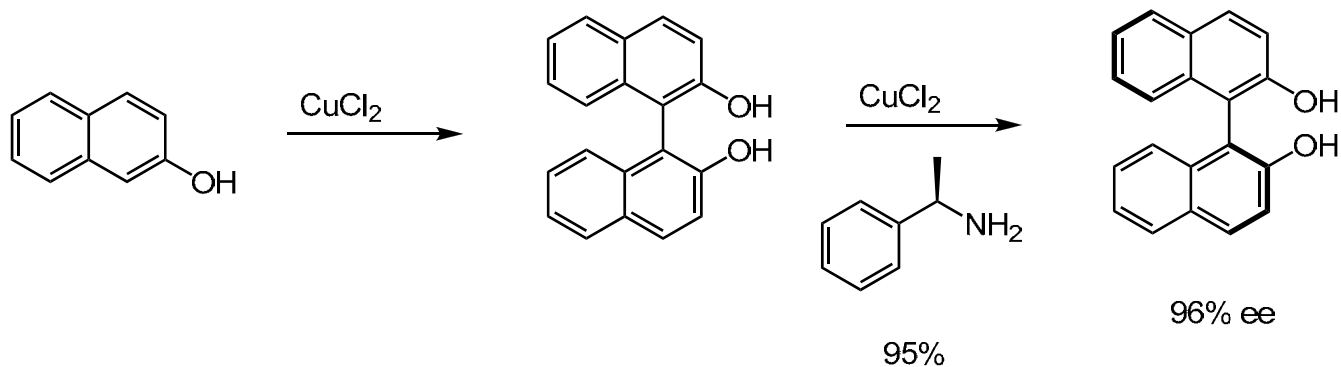


98.4% ee

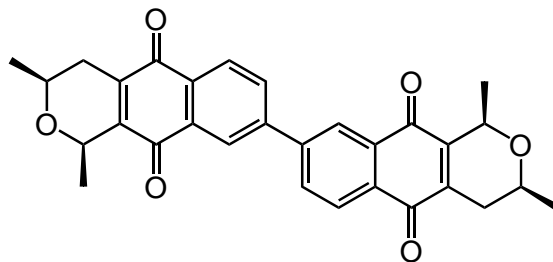
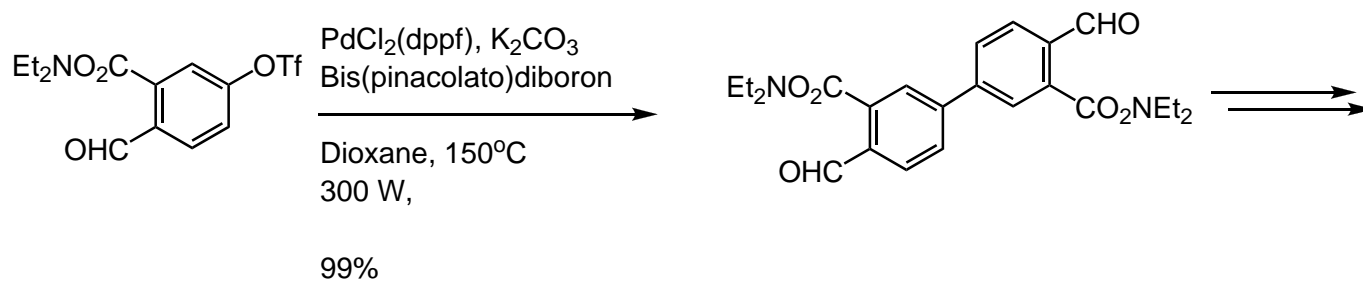
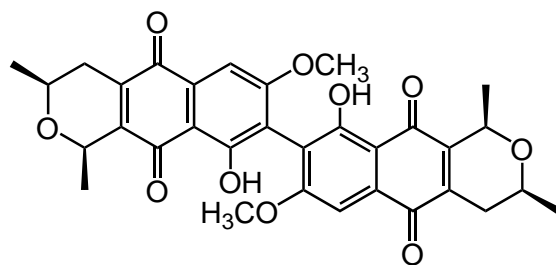


d.r. > 50:1

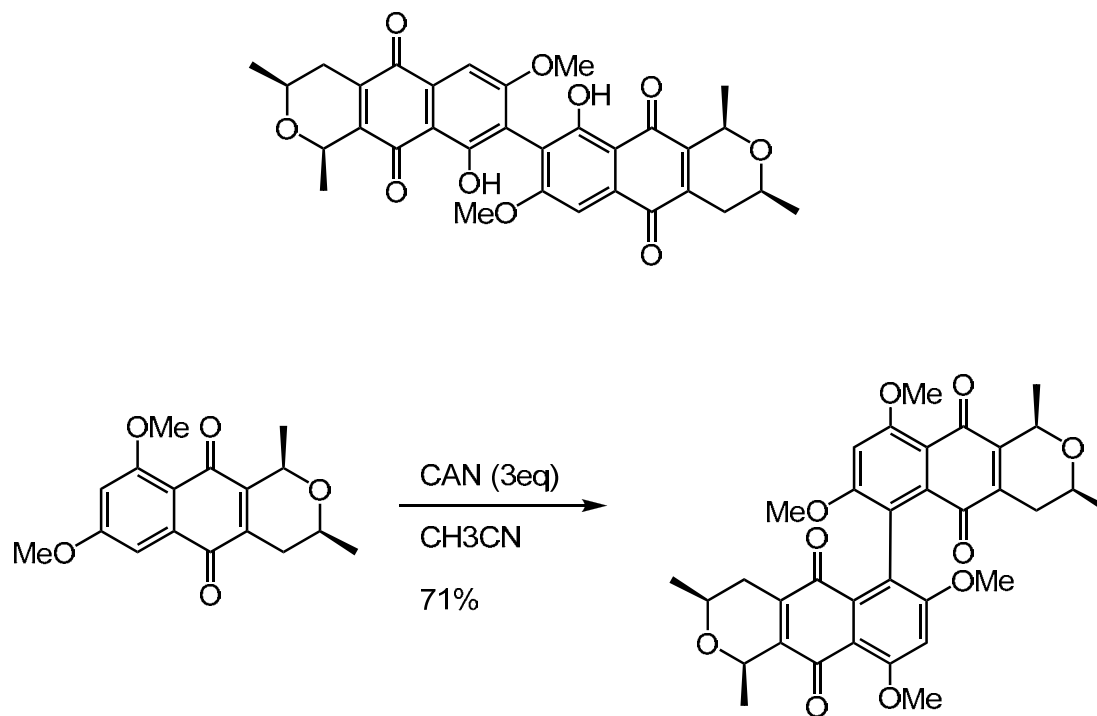
Chiral Amines



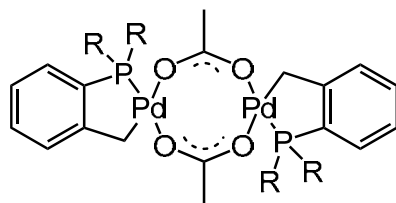
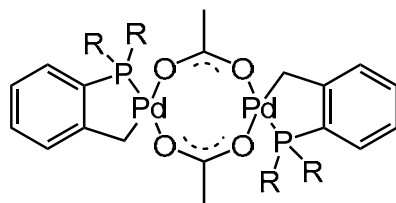
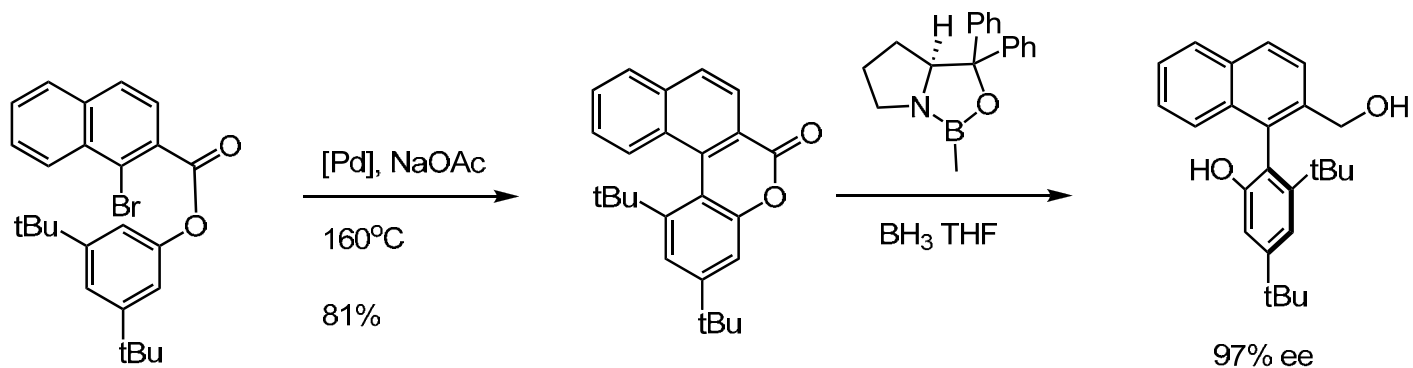
Other Coupling Conditions

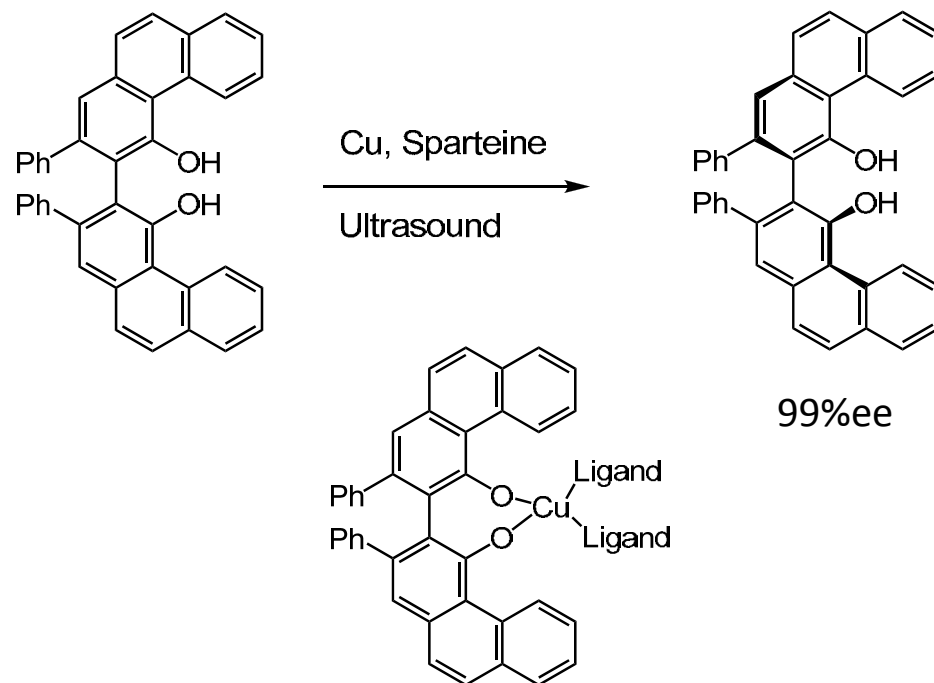


Another Attempt



Other attempts to Chiral Biaryls





- What are Atropisomers
- Nomenclature of Atropisomers
- Ullman Couplings
- One electron coupling
- Oxidative Copper couplings
- Other Approaches to Chiral biaryls