

Enantioselective Total Synthesis of (+)-Aberrarone

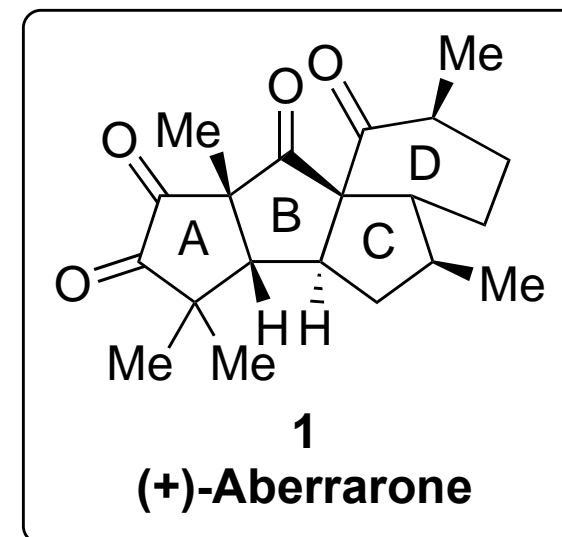
E. M. Carreira *et al.* *J. Am. Chem. Soc.*, **2022**, *144*, 15475.

(+)-Aberrarone was firstly isolated in 2009 from the Caribbean sea whip *Pseudopterogorgia elisabethae*, which exhibits anti-inflammatory effects and are present in various skin care products.

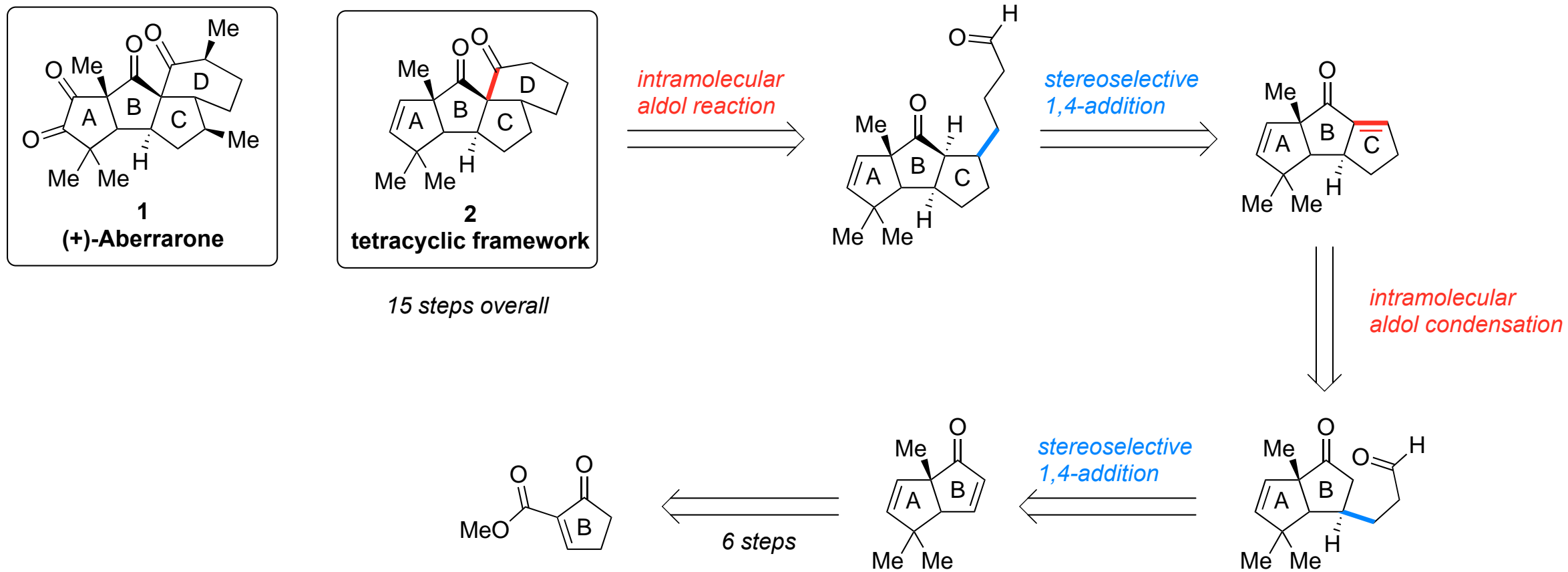
(+)-Aberrarone bears 5-5-5-6-fused tetracyclic framework, seven stereogenic centers including three quaternary carbons, and four ketones.

To date, there is only a single study toward the synthesis of a racemic analogue of Aberrarone. Also, the synthetic route was separate, iterative construction of the rings.

This is the first total synthesis of **(+)-Aberrarone**. A, B, D rings are constructed by a key cascade cyclization reaction in a single step.

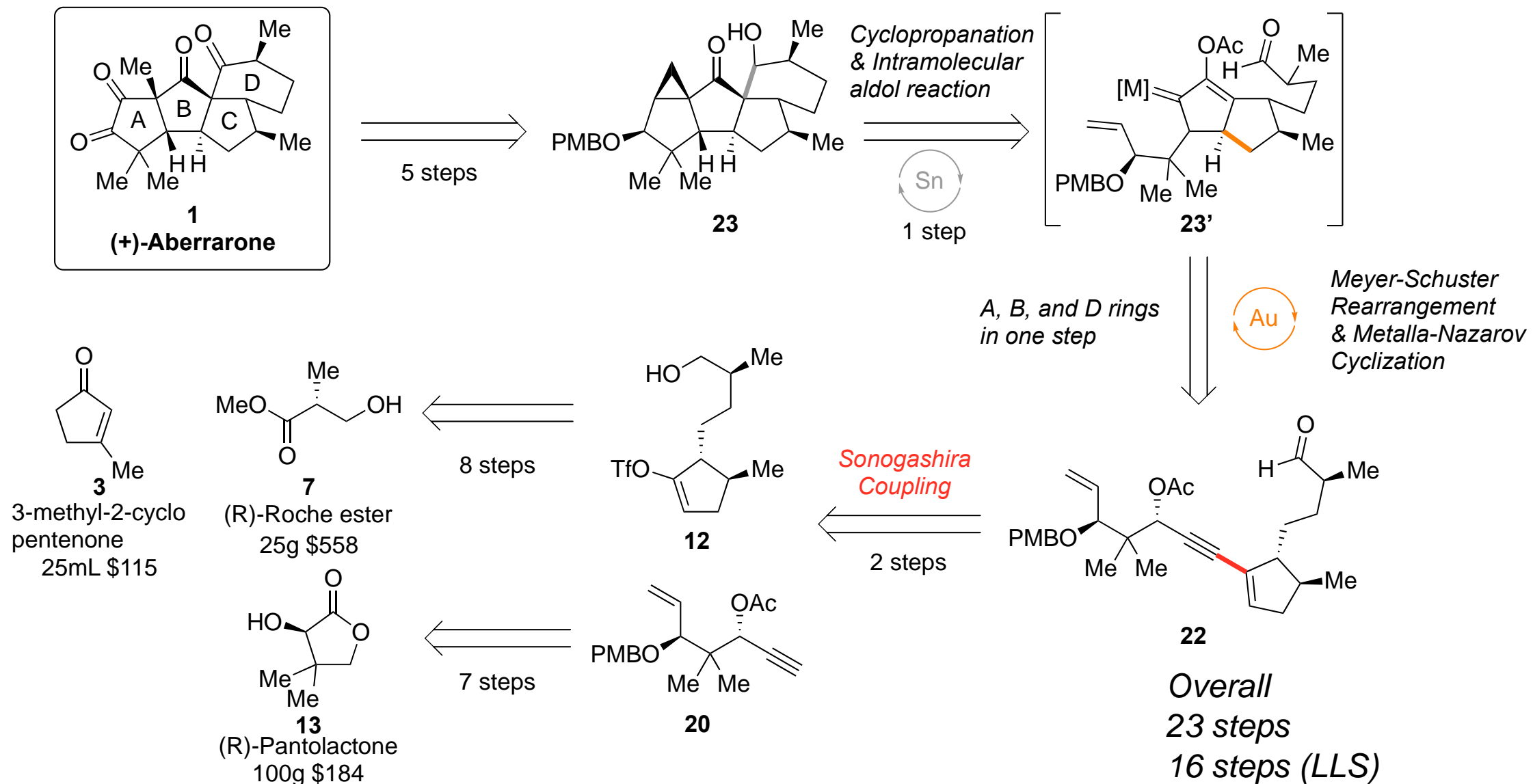


Previous Study



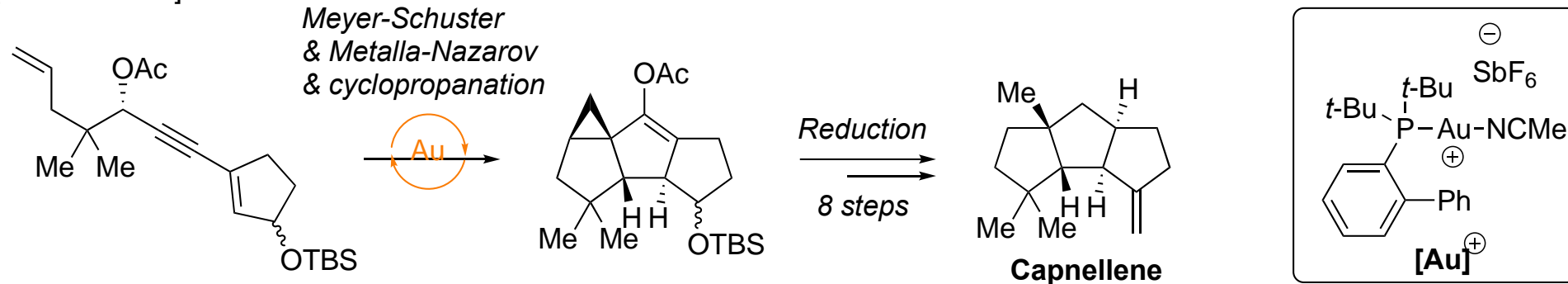
H. Ito *et al.* *Tetrahedron*, **2015**, *71*, 5918.

Retrosynthetic Analysis



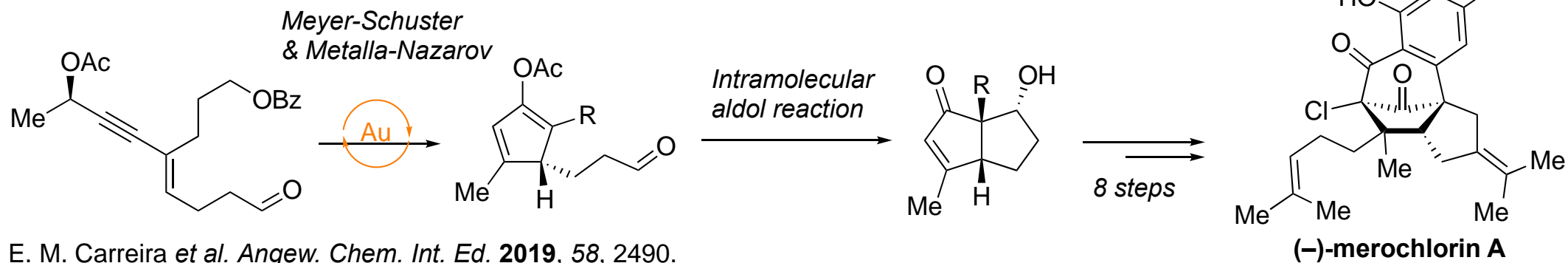
Key Step: Inspired work

[Pioneer Work]



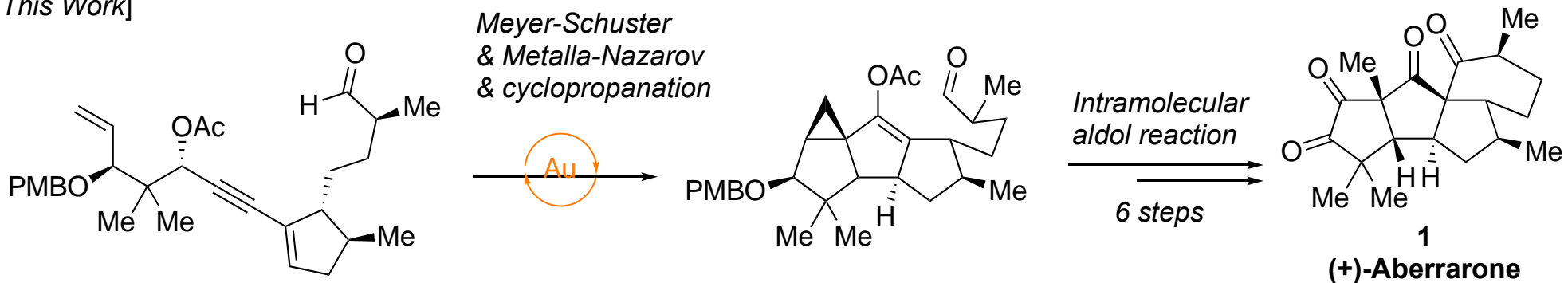
M. Malacria *et al.* *J. Am. Chem. Soc.* **2009**, 131, 2993.

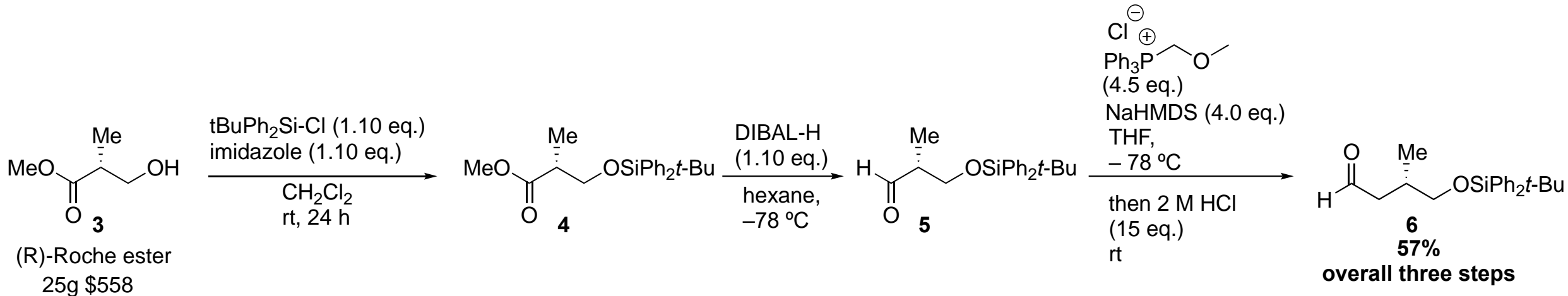
[Prior Work]



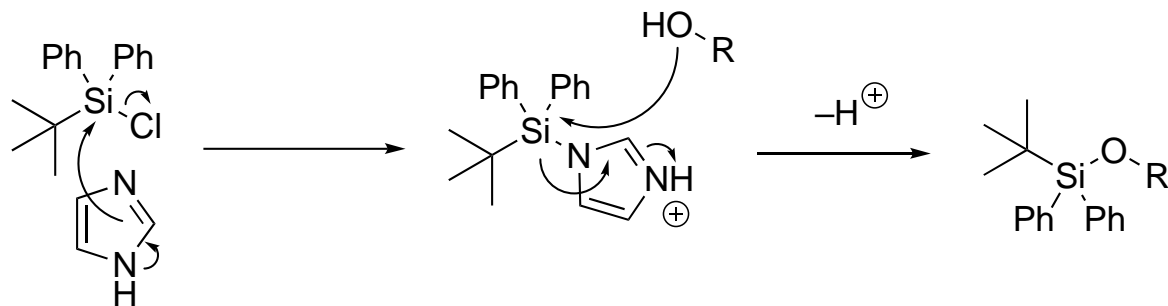
E. M. Carreira *et al.* *Angew. Chem. Int. Ed.* **2019**, 58, 2490.

[This Work]

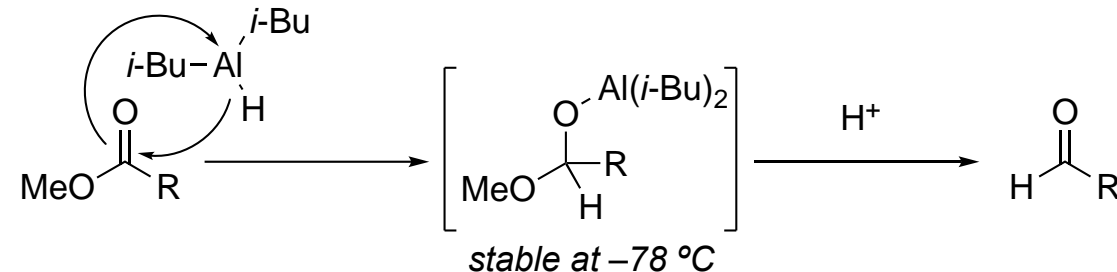




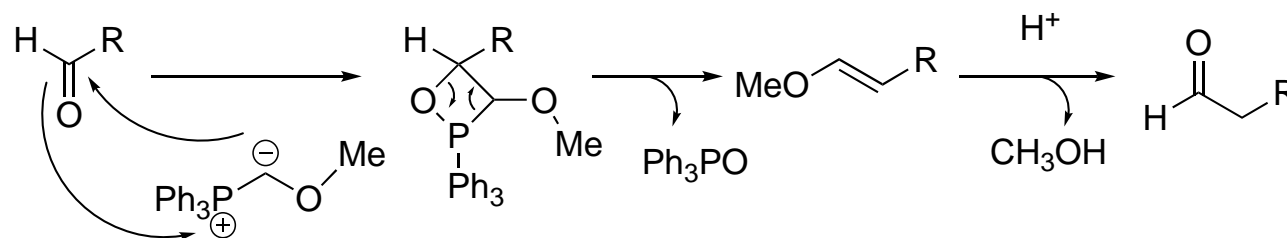
Silyl protection of alcohol

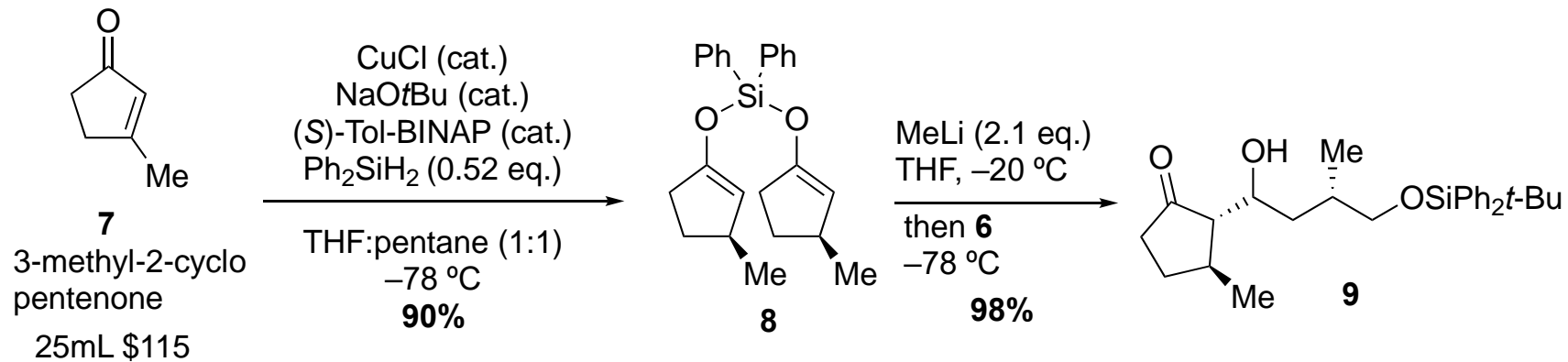


DIBAL reduction of ester to aldehyde

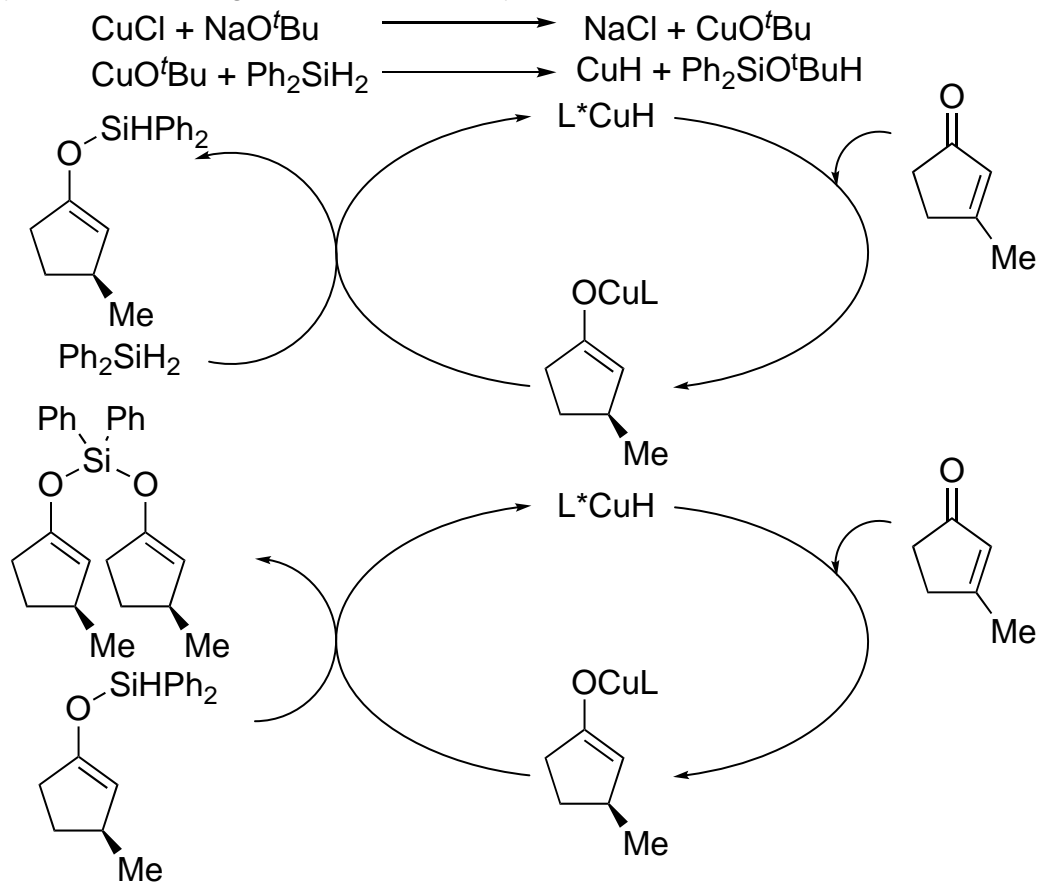


Carbon homologation by wittig reaction

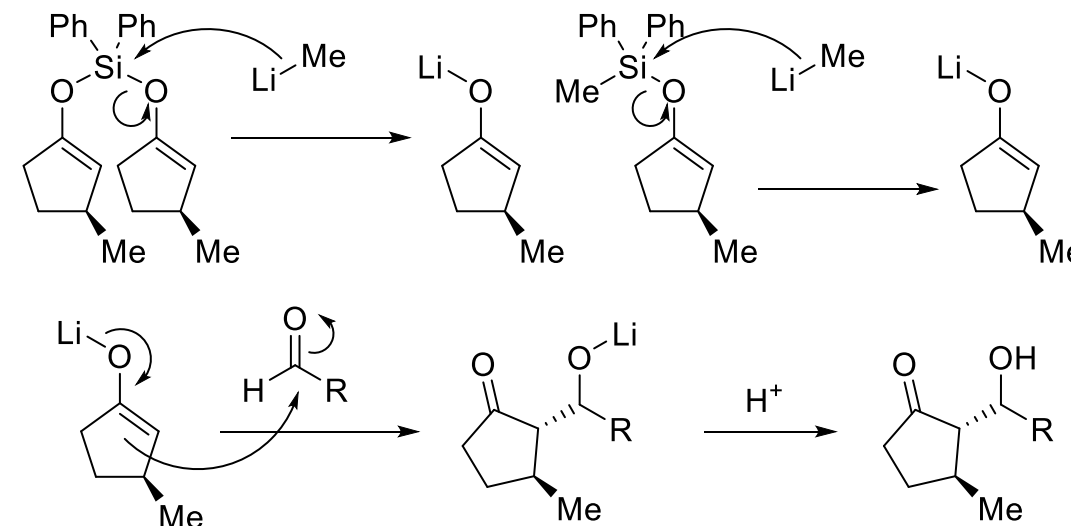




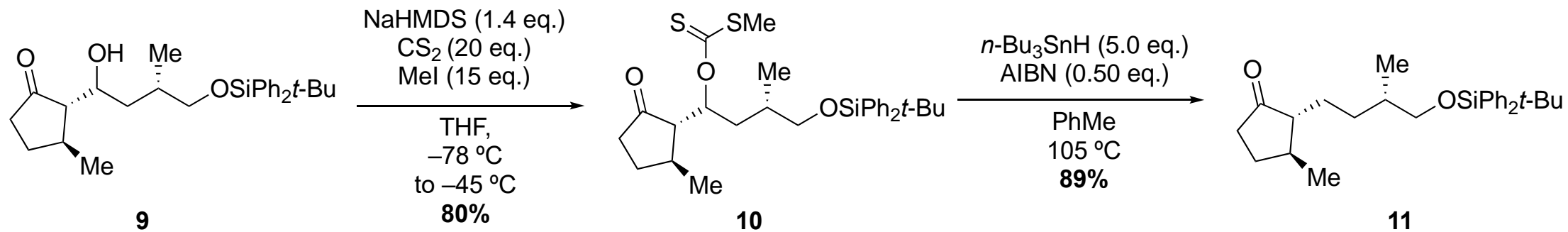
Asymmetric conjugate reduction of cyclopentanone



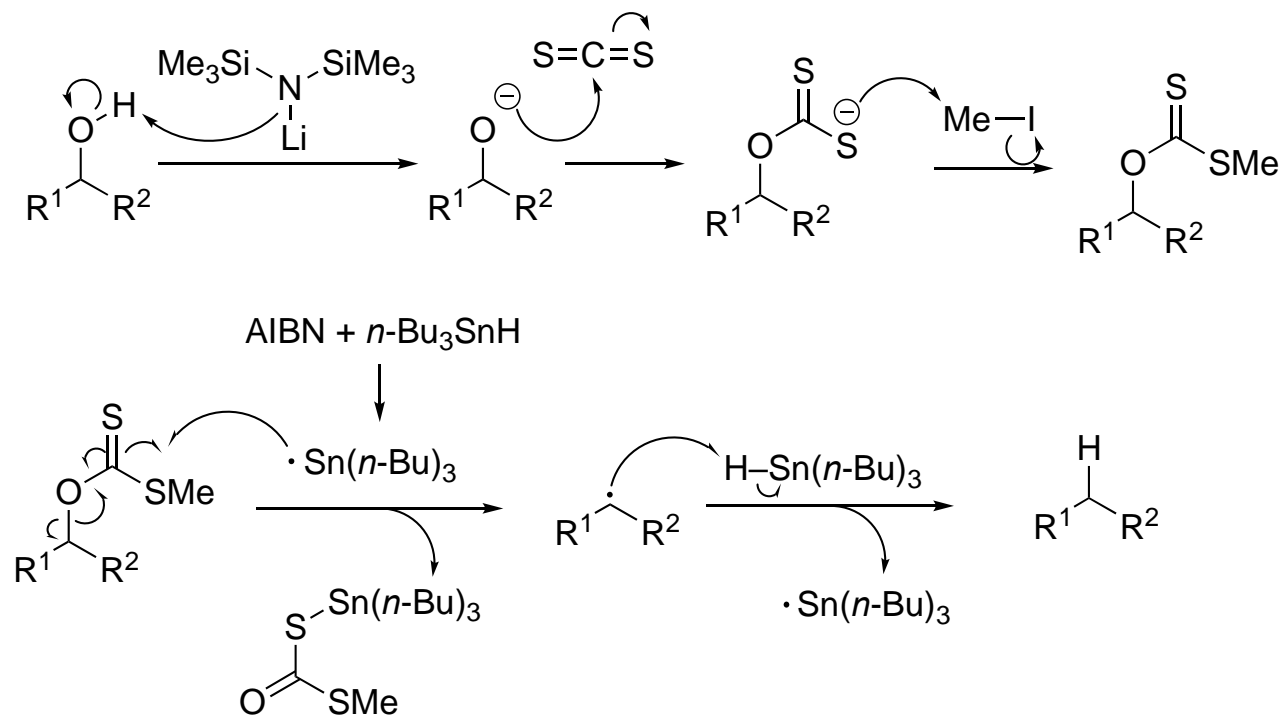
Aldol reaction

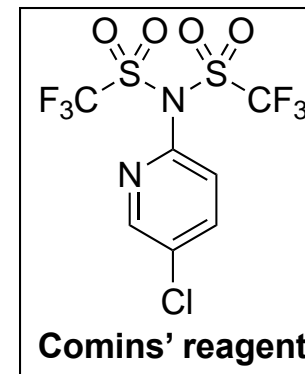
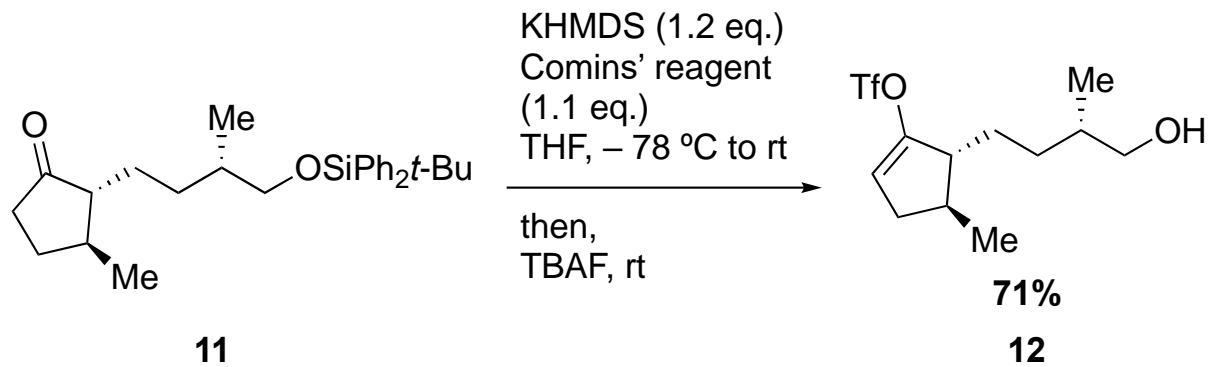


S. L. Buchwald et al. *J. Am. Chem. Soc.* **2000**, *122*, 6797.
Org. Lett. **2004**, *6*, 4809.

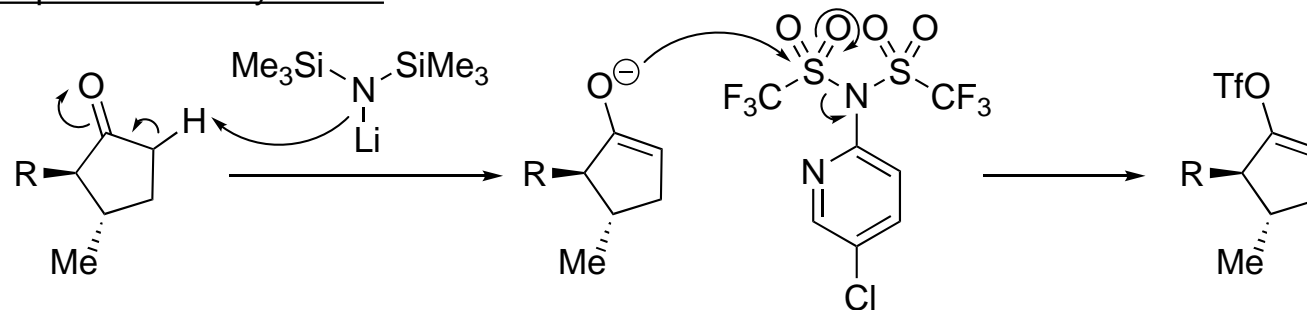


Barton-McCombie Deoxygenation

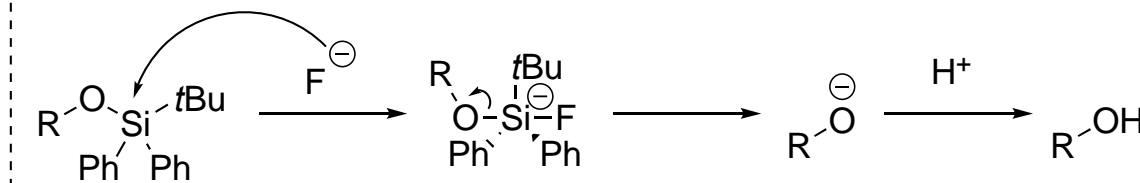


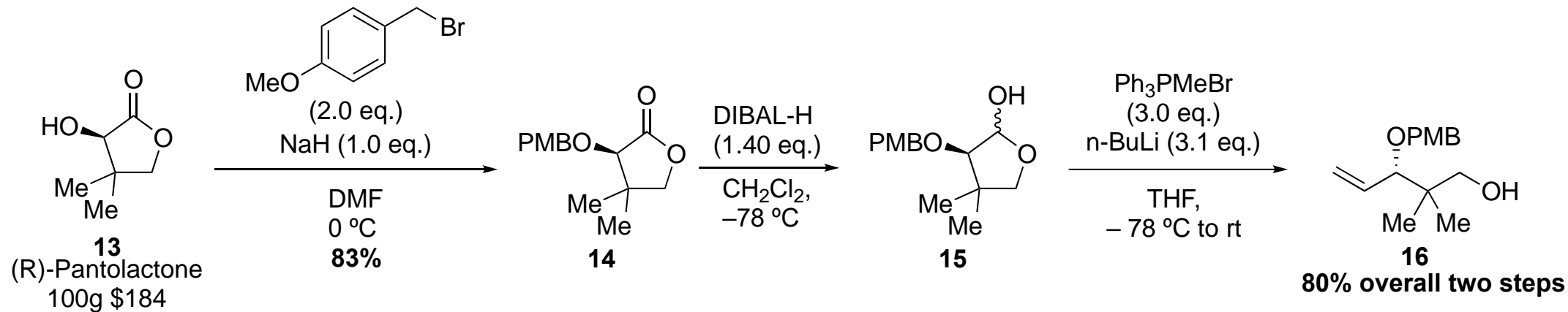


Preparation of vinyl triflate

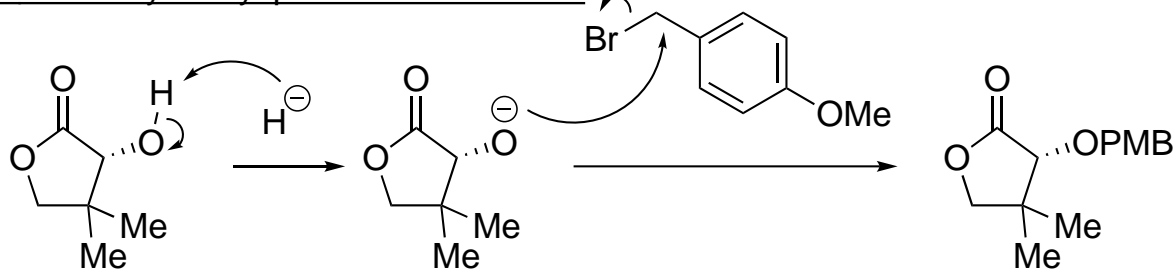


Deprotection of silyl protecting groups

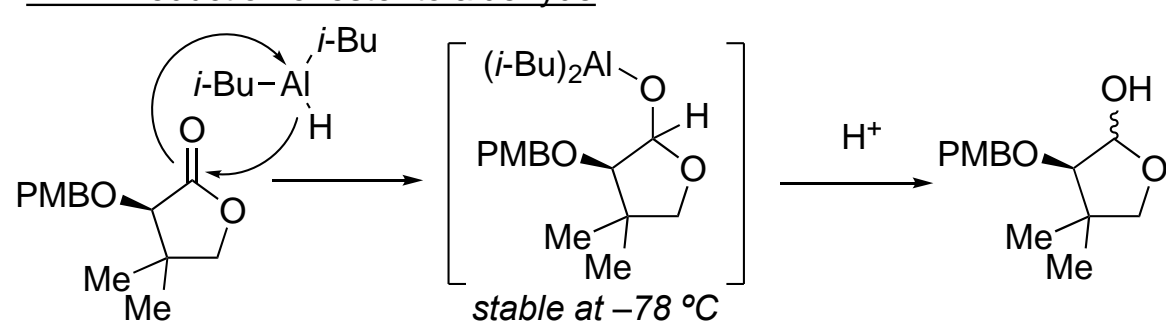




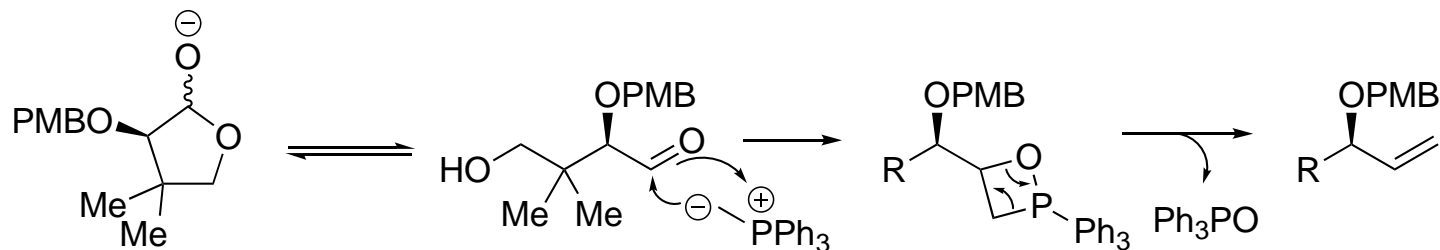
Para-methoxybenzyl protection of alcohol

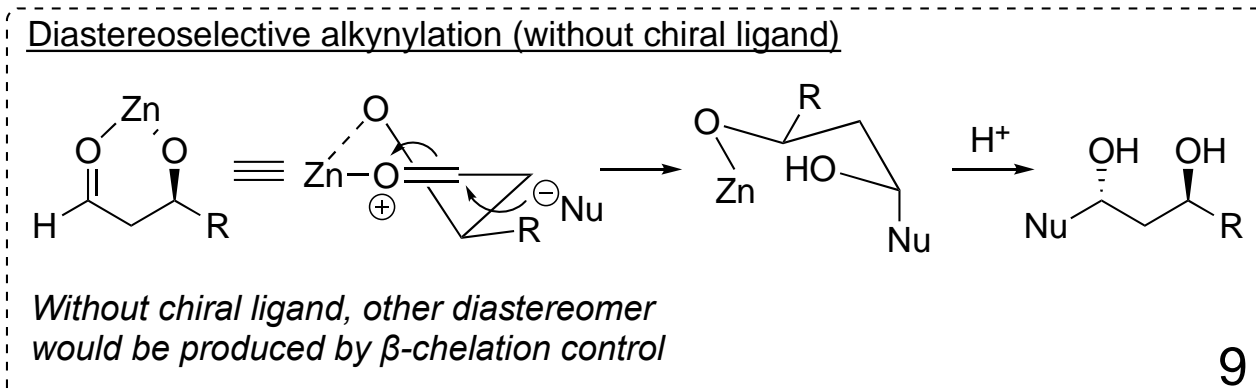
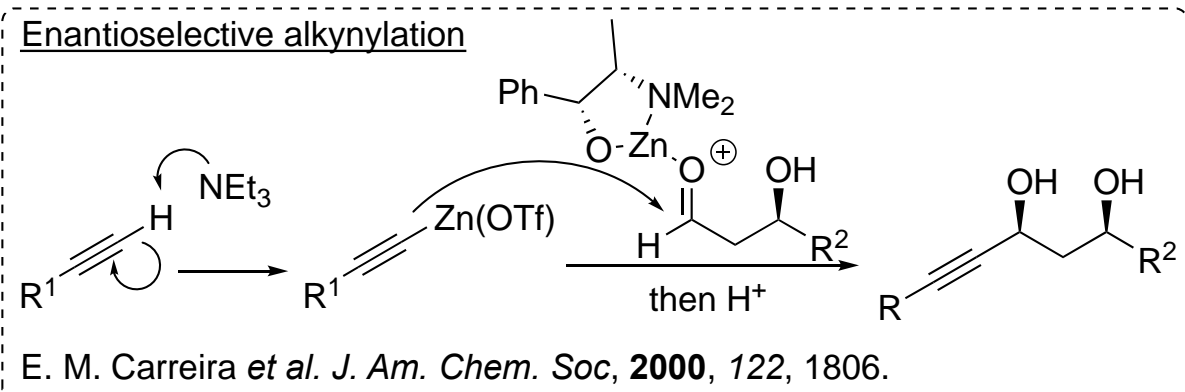
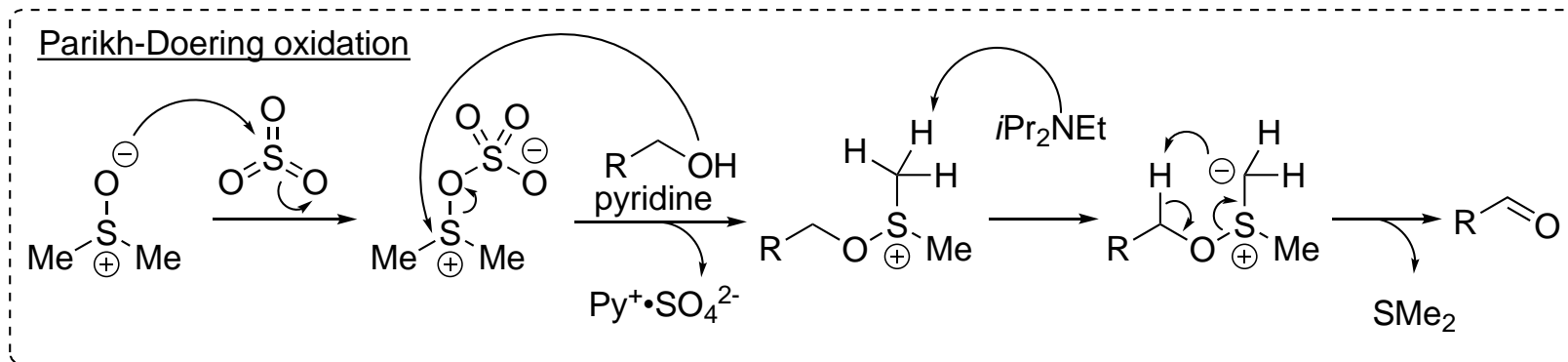
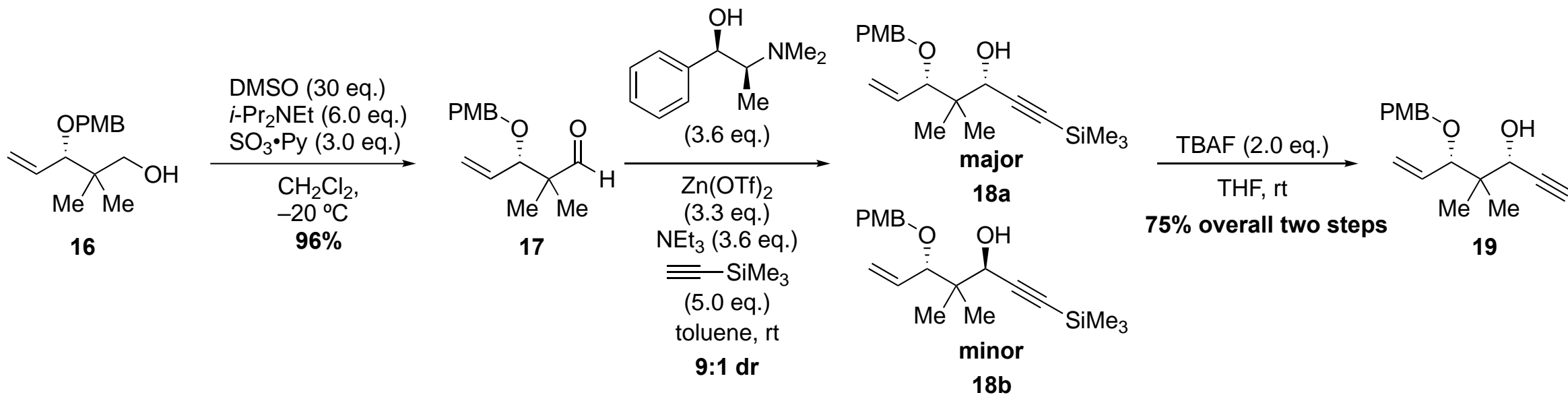


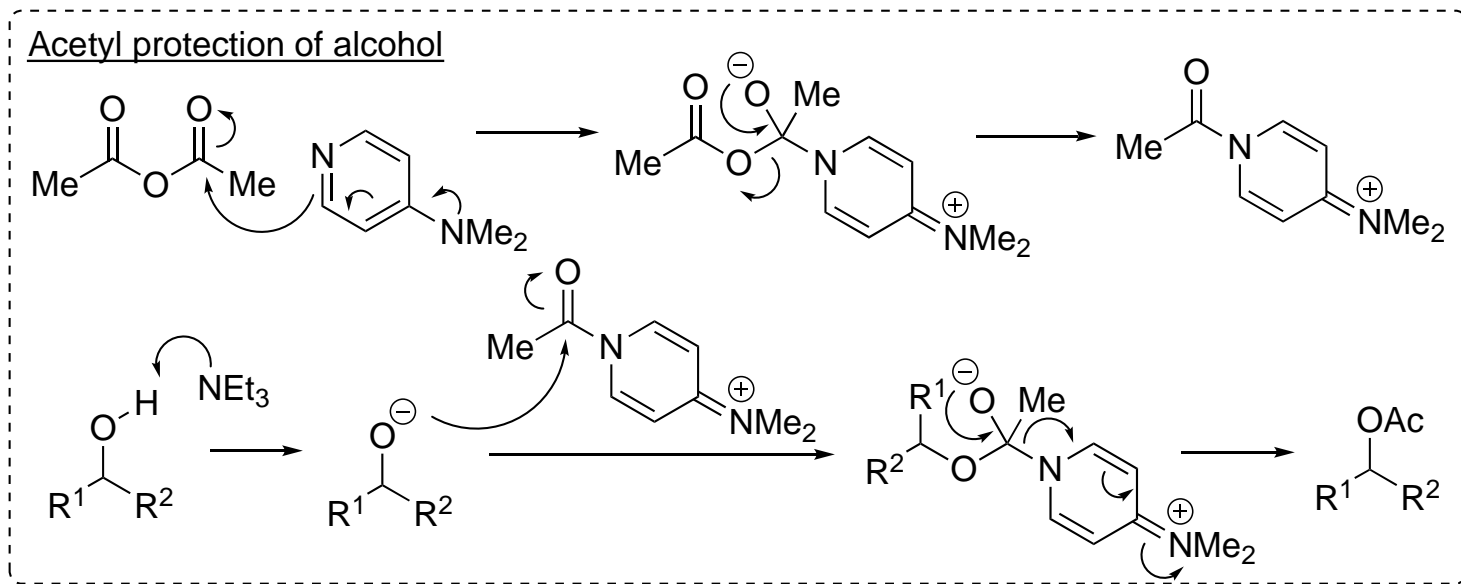
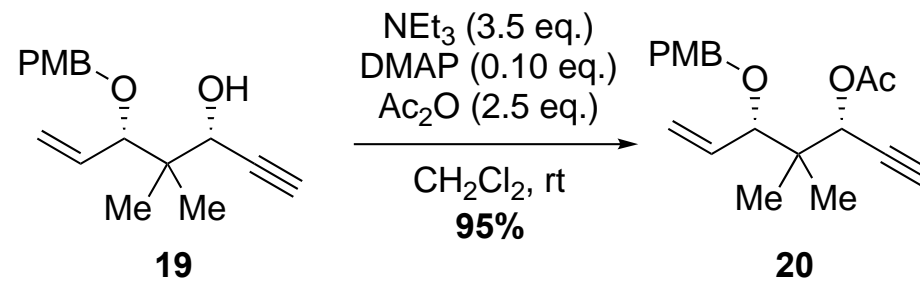
DIBAL reduction of ester to aldehyde

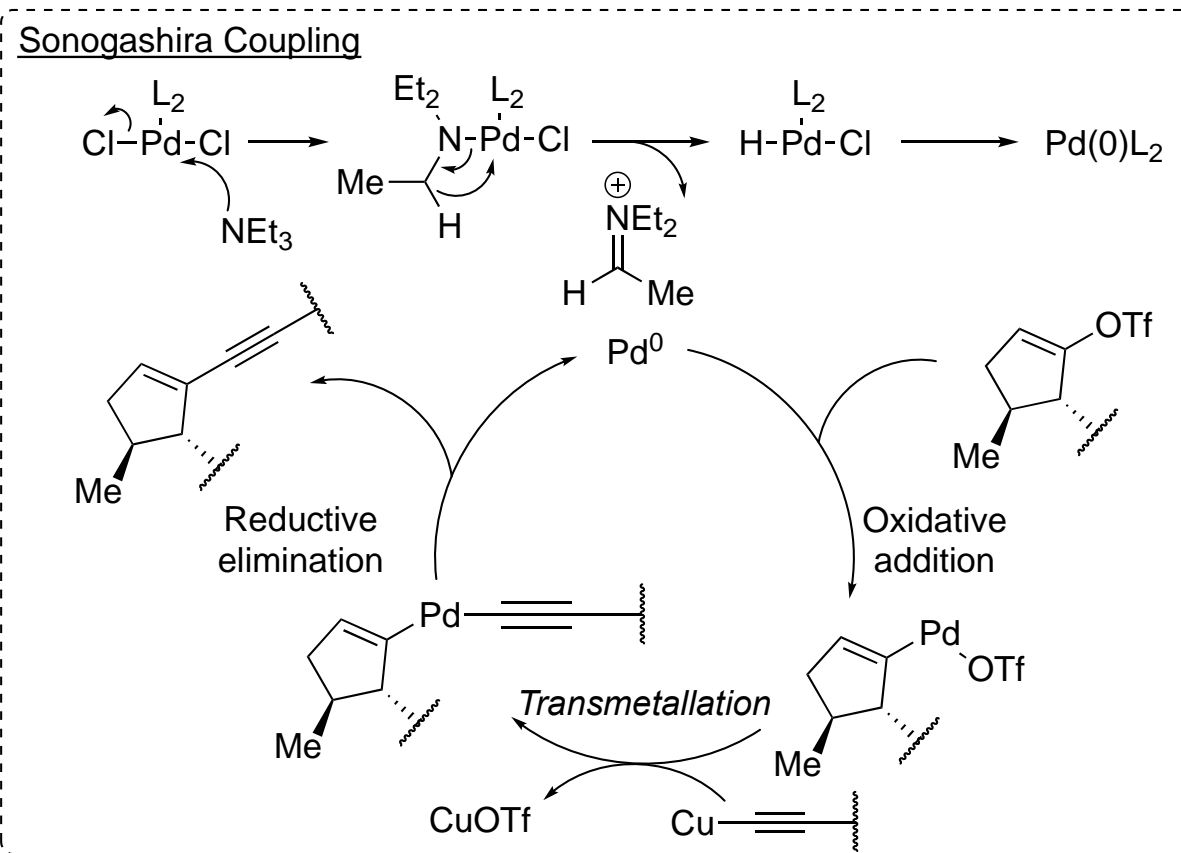
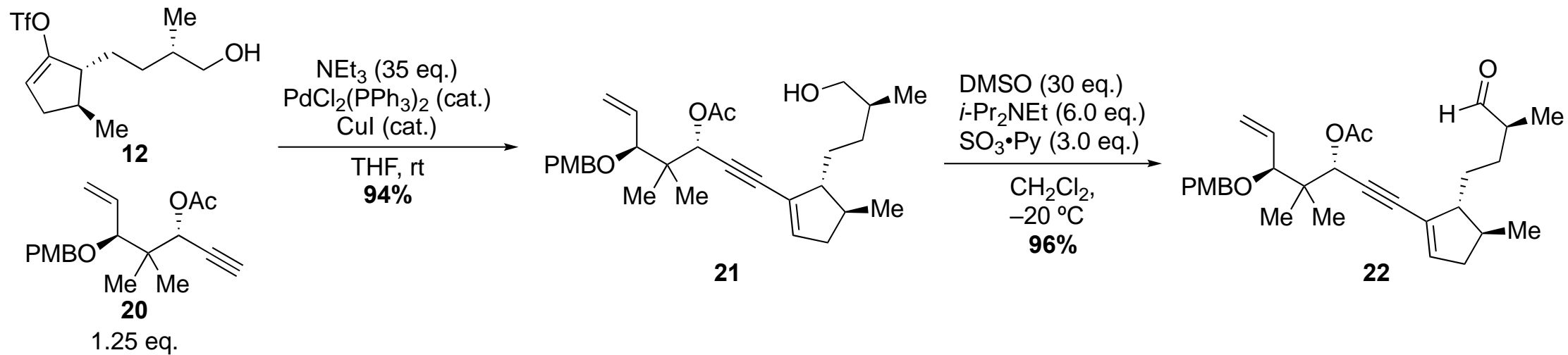


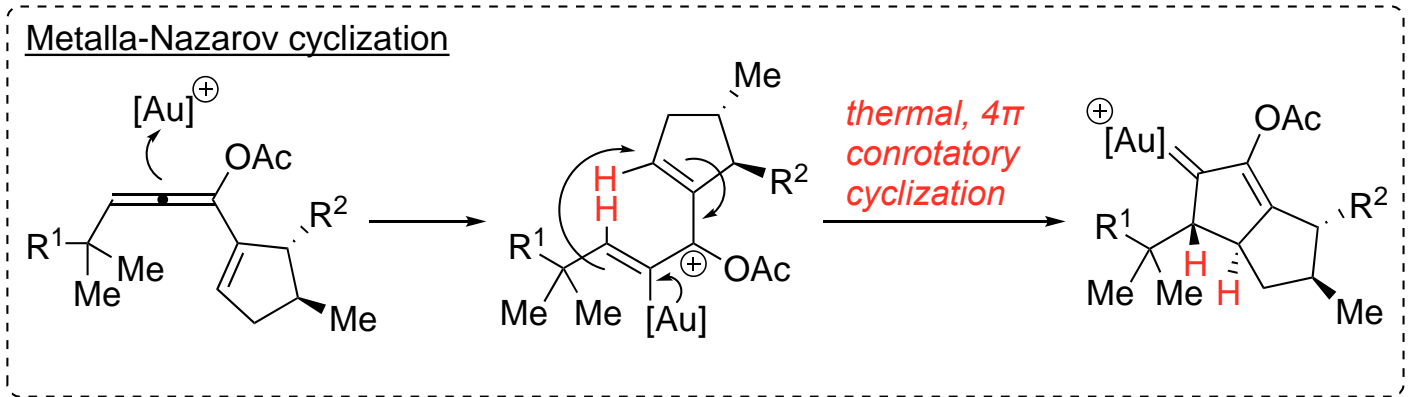
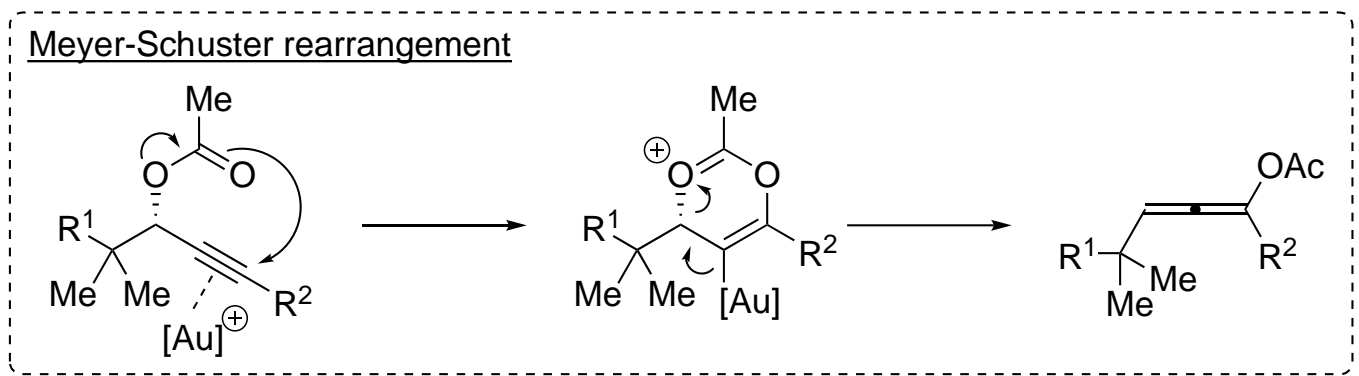
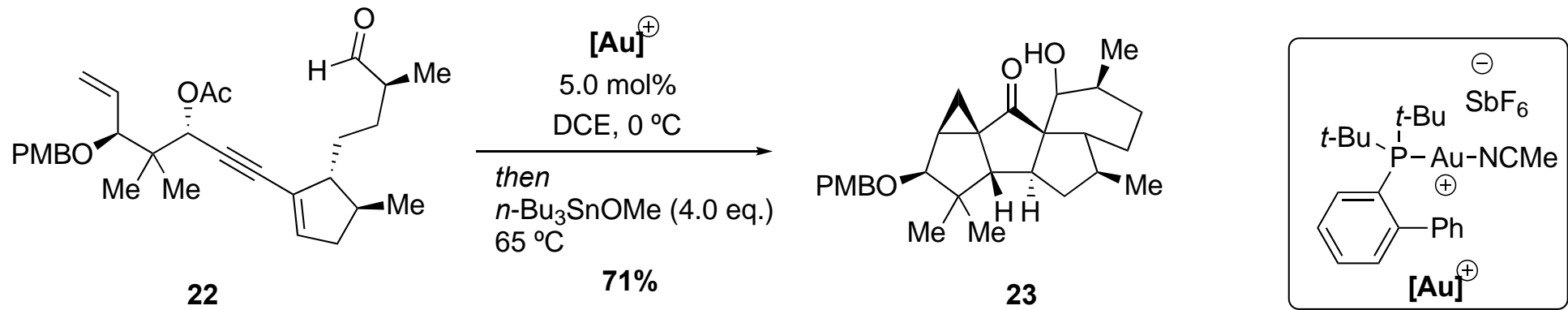
Wittig reaction

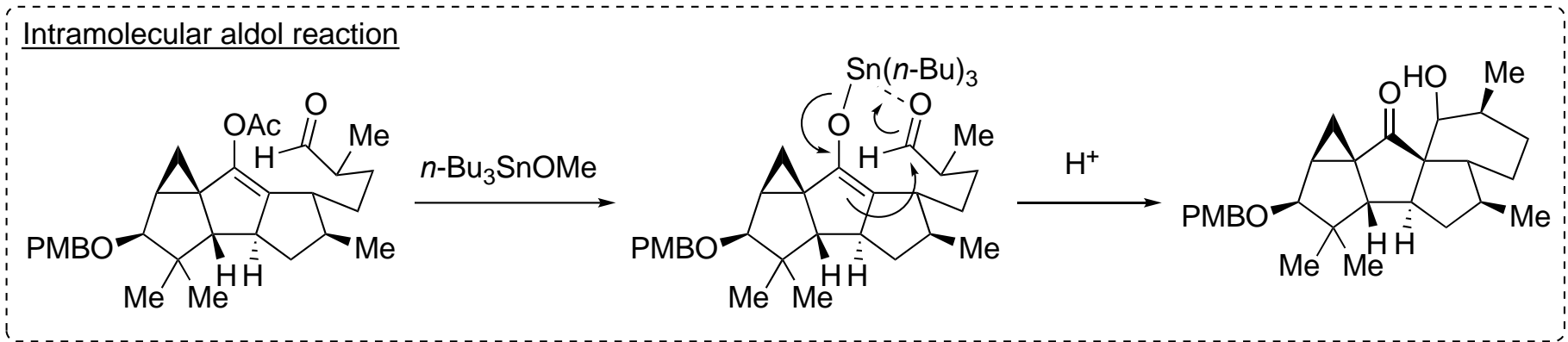
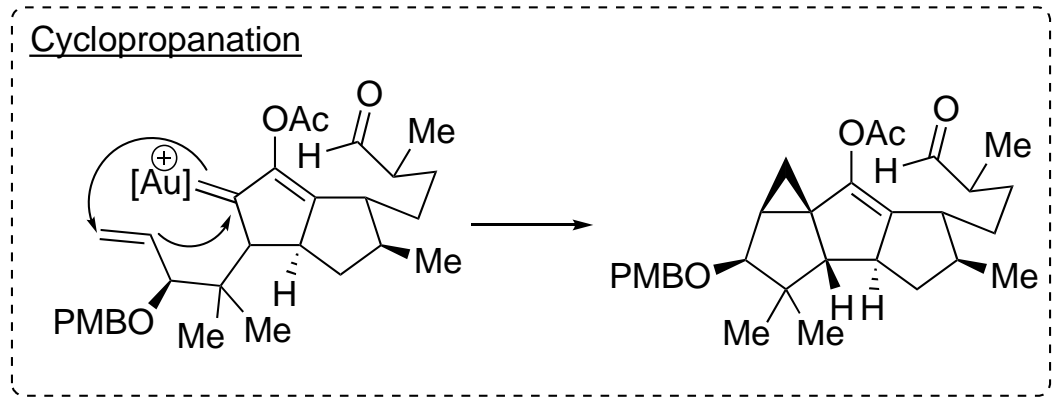
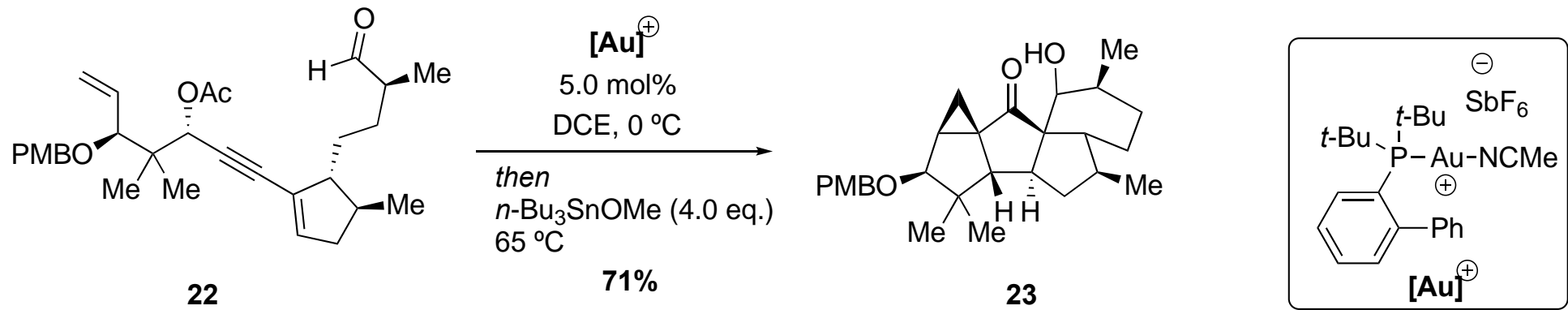


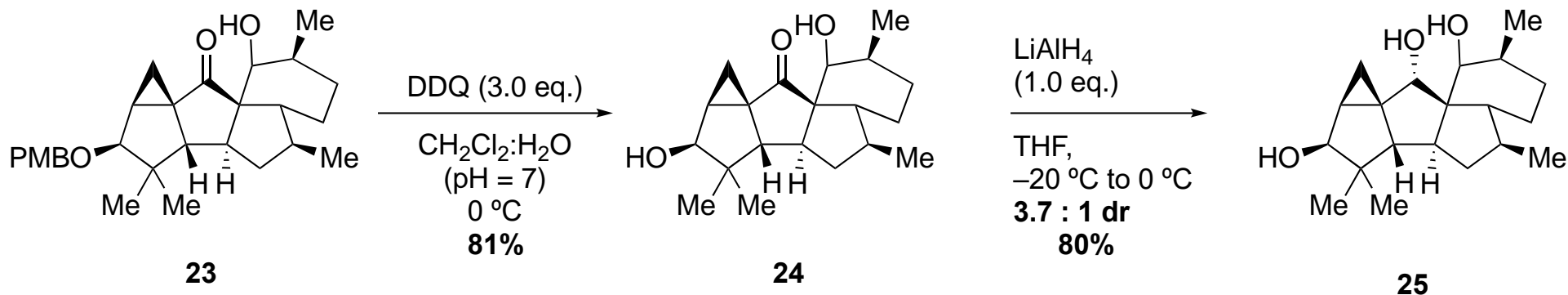




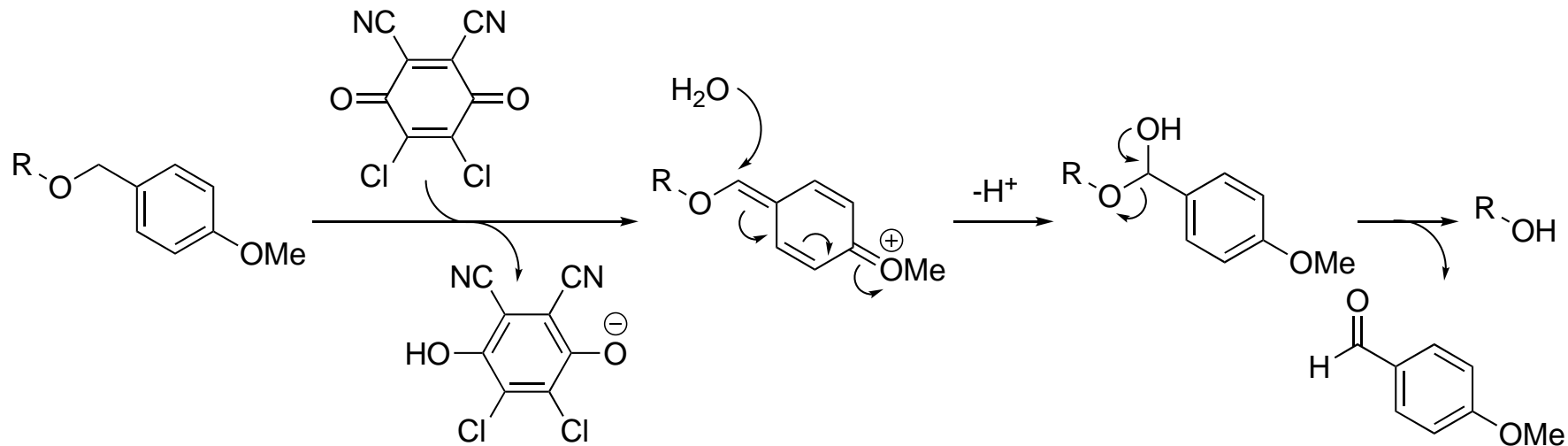




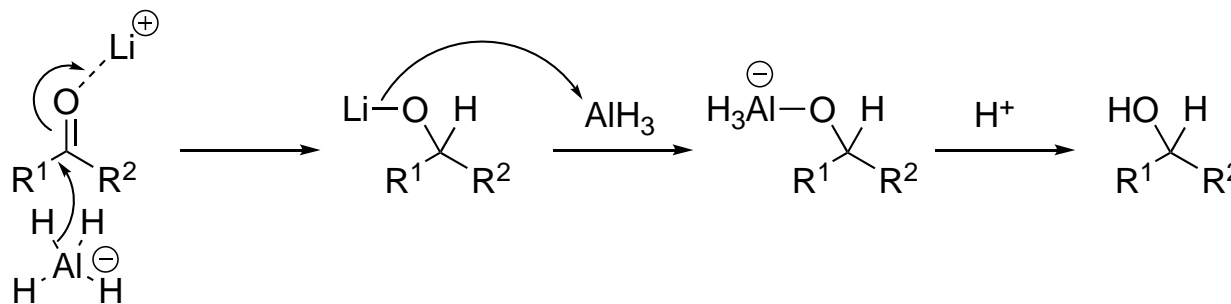


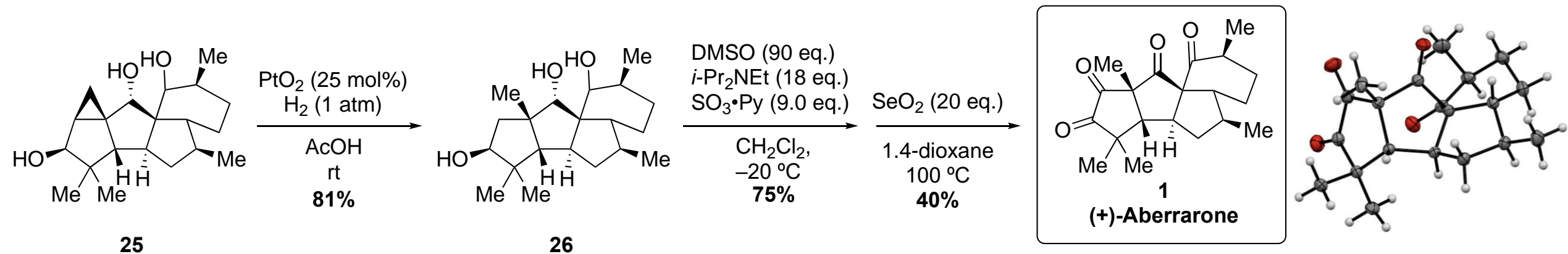


Deprotection of PMB group by DDQ

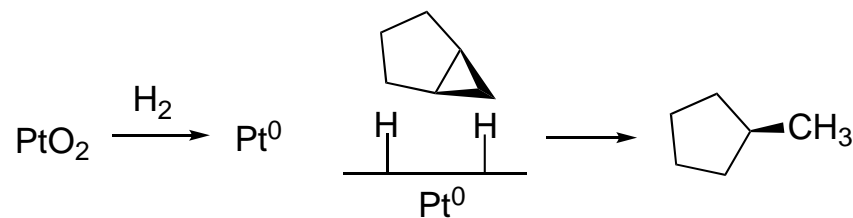


LAH reduction of ketone to alcohol





Pt-catalyzed hydrogenation of cyclopropane



A. L. Rheingold *et al.* *J. Org. Chem.*, **2002**, 67, 4501.

Riley oxidation

