

Total Synthesis of (+)-Aberrarone

Yang Wang, Yongjian Su, and Yanxing Jia*



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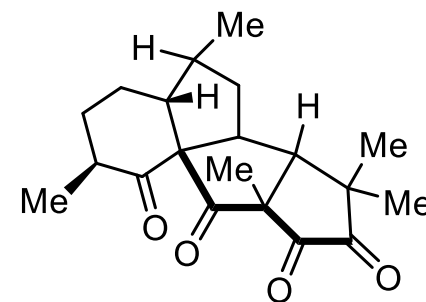
Introduction:

- A linear triquinanes isolated from the West Indian gorgonian octocoral *Pseudopterogorgia elisabethae* in 2009
- In vitro activity against malaria parasite
- Featuring a unique 6/5/5/5 tetracyclic ring system with four ketones, seven stereocenters, and three quaternary carbon centers
- A concise 12-step total synthesis via the radical cascade strategy.

Jiangpeng Liu

Liu Research Group

6/21/2023

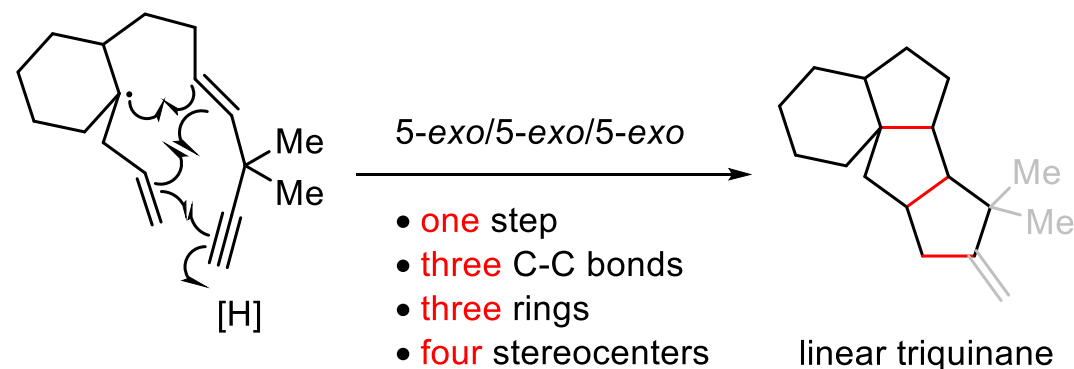


(+)-Aberrarone

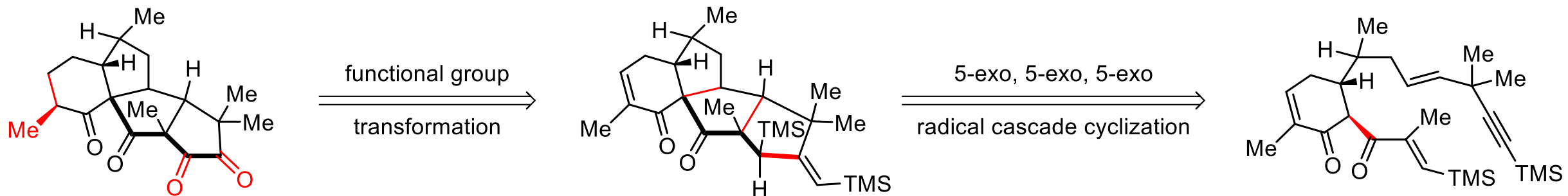
Carreira (2022)
15 steps

This work
12 steps (protecting-group-free)

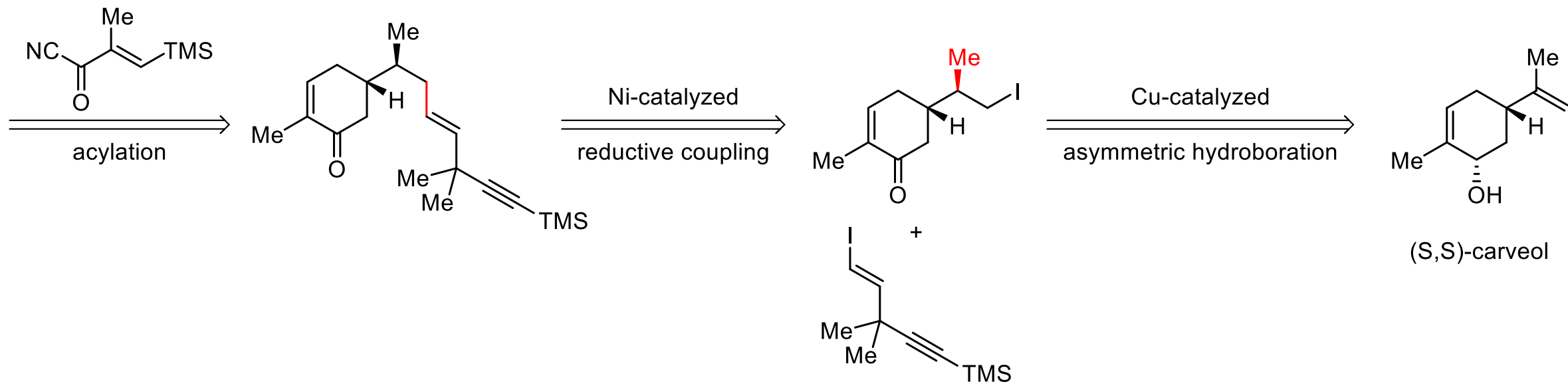
radical cascade strategy:



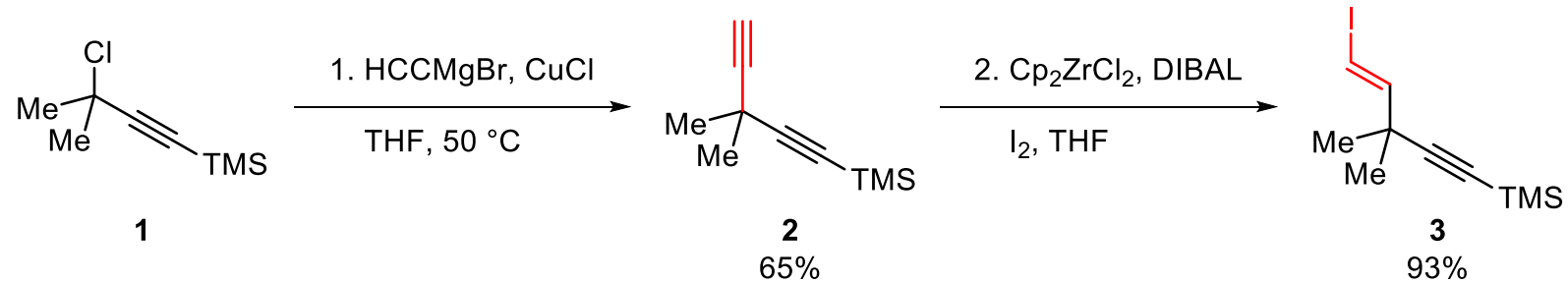
Retro-synthetic route



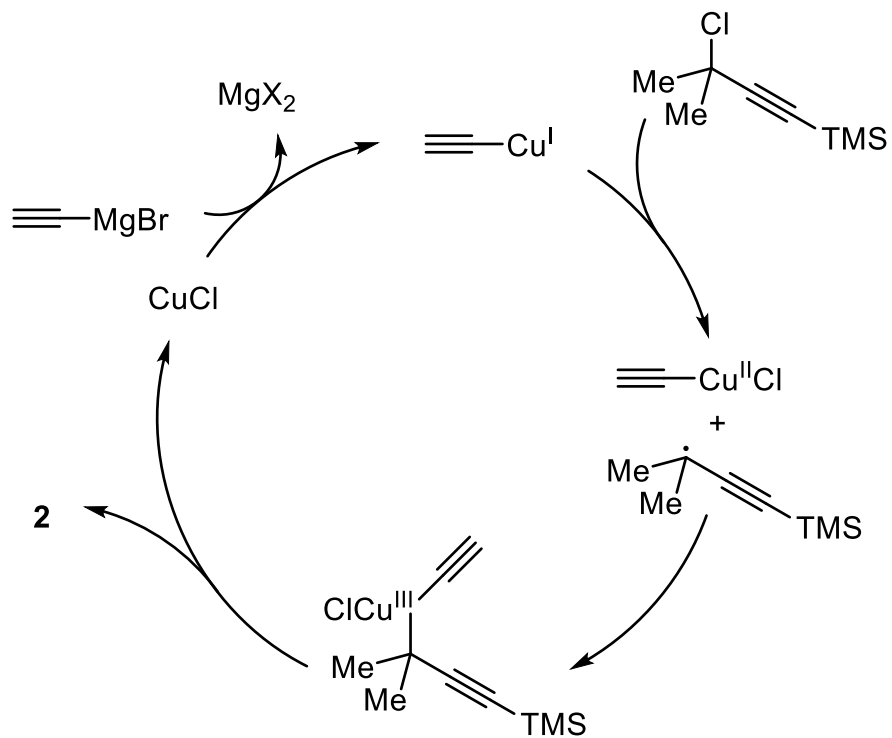
(+)-Aberrarone



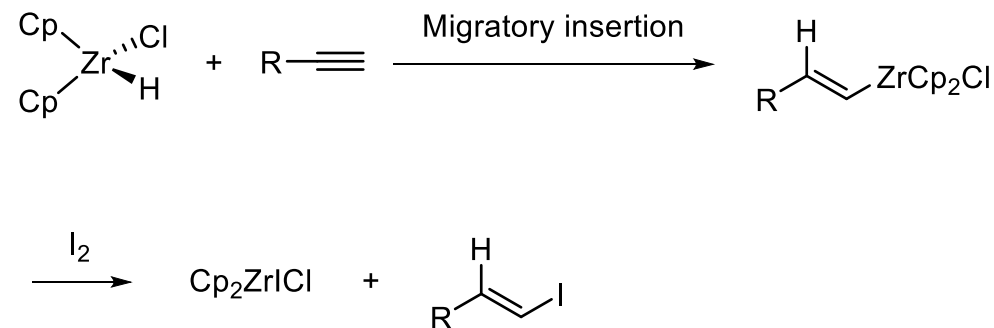
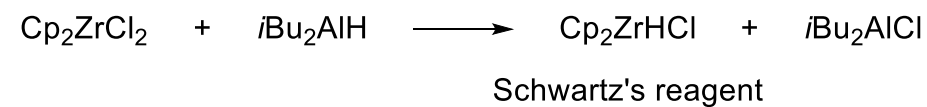
(S,S)-carveol

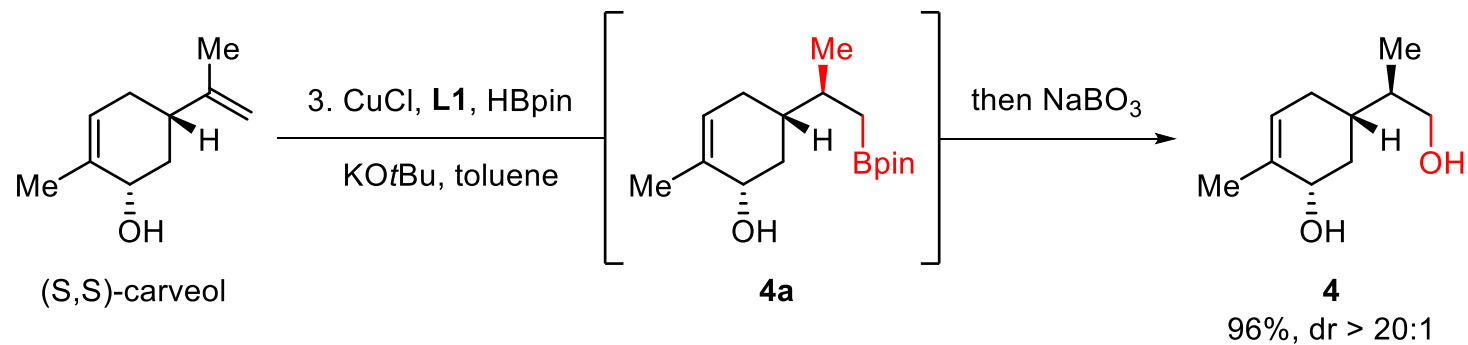


Copper-based Kumada cross coupling (proposed mechanism):

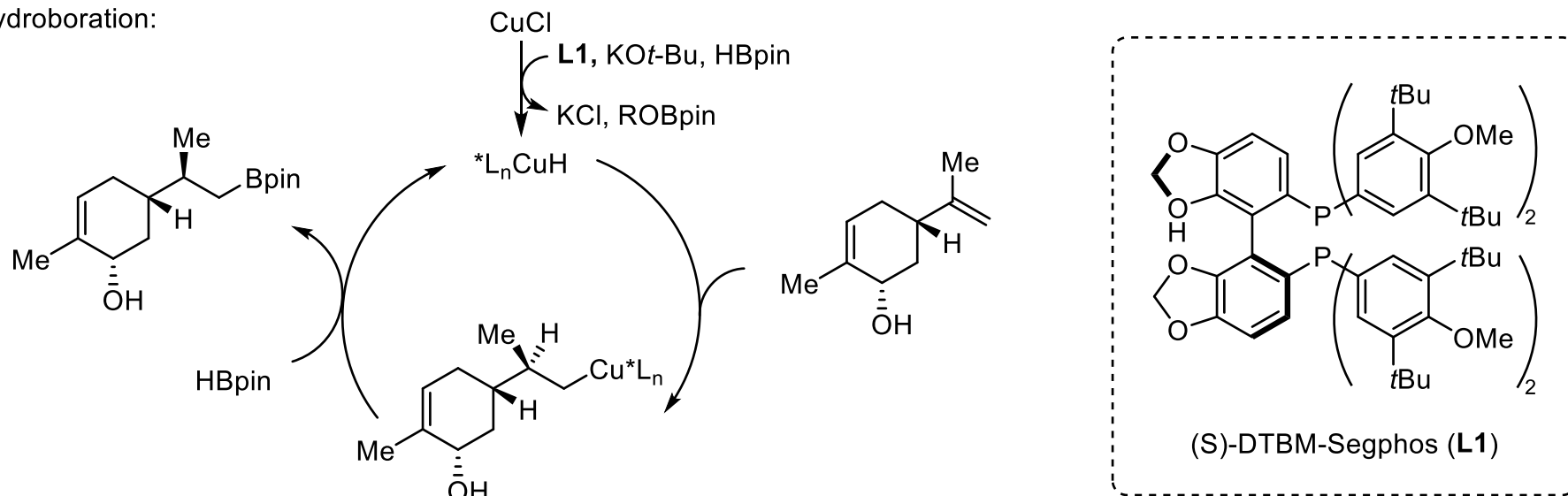


Synthesis of vinyl iodide via hydrozirconation:

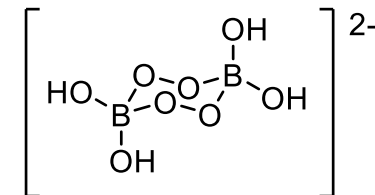
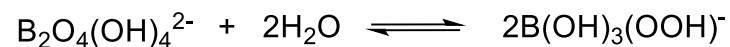
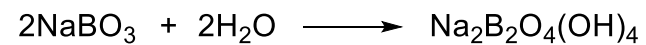
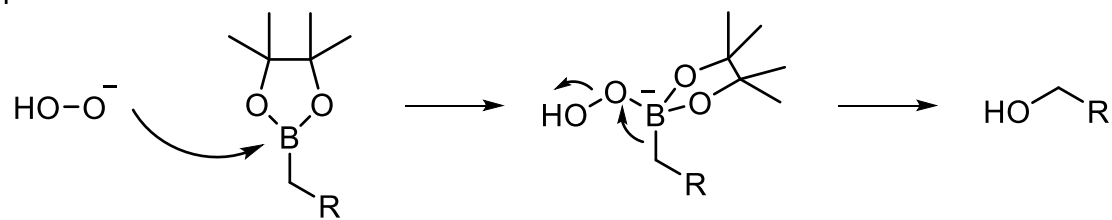


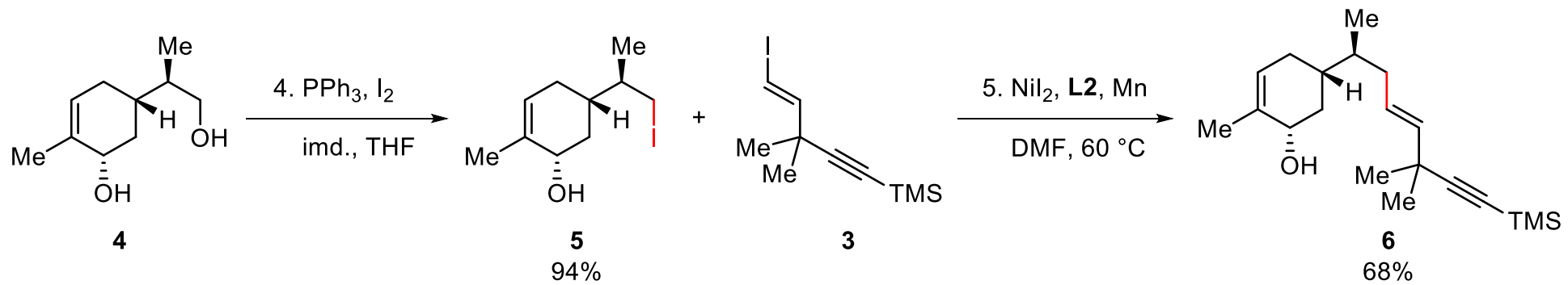


Cu-catalyzed asymmetric hydroboration:

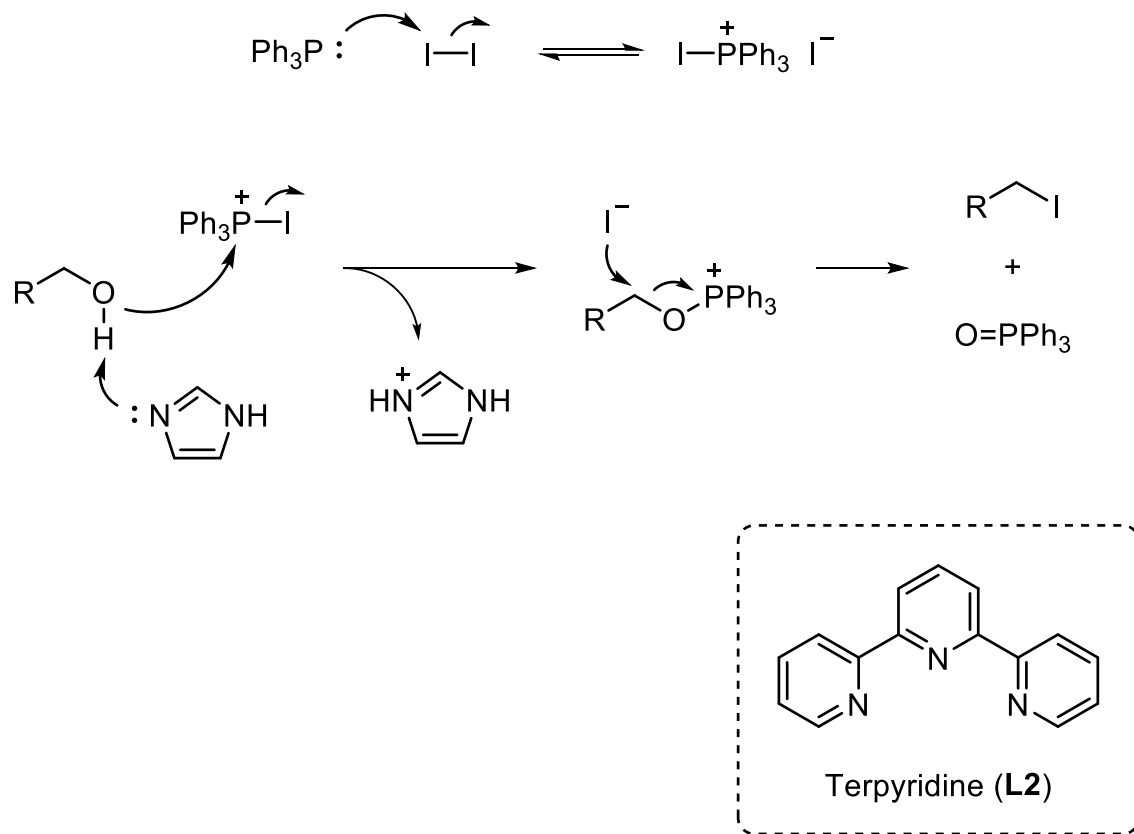


Bpin oxidation:

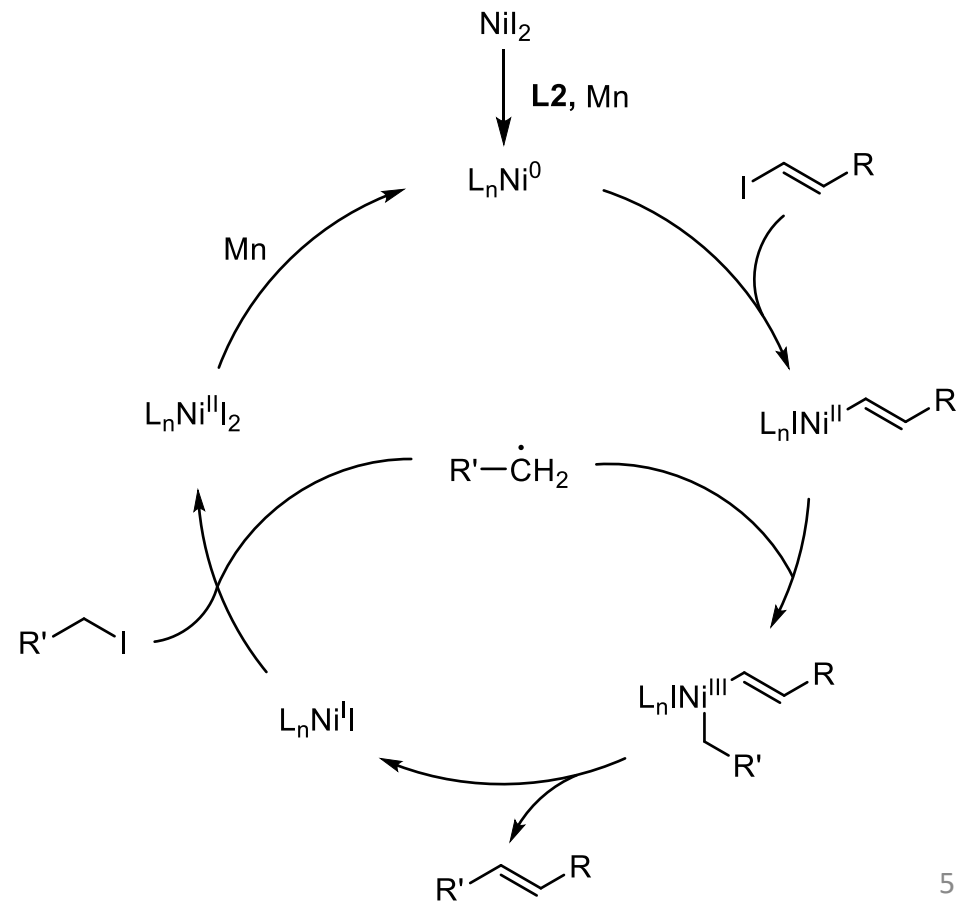


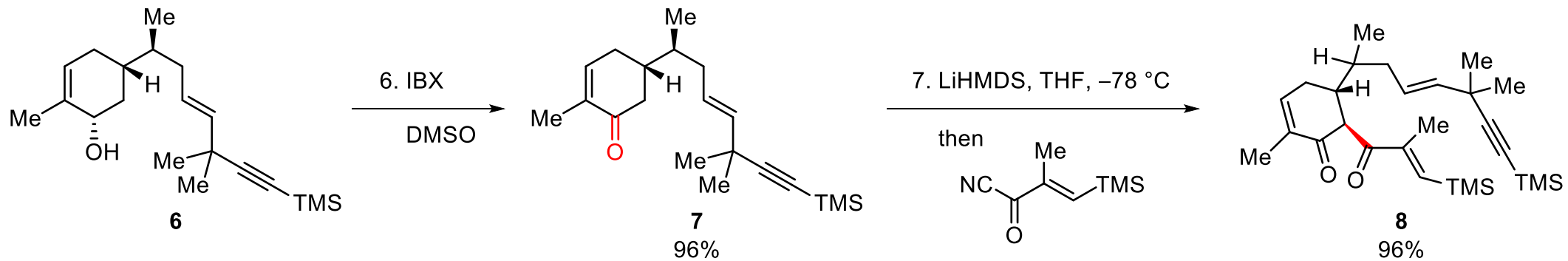


Appel reaction:

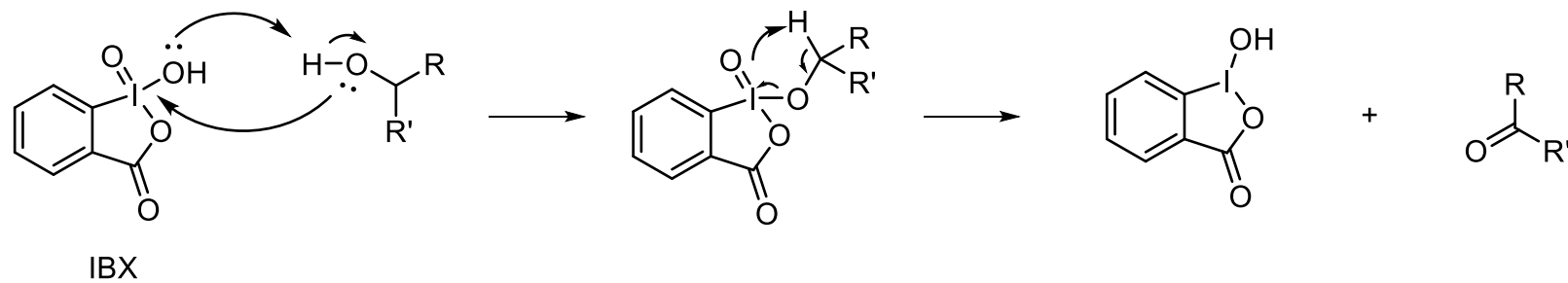


Ni-catalyzed reductive cross coupling:

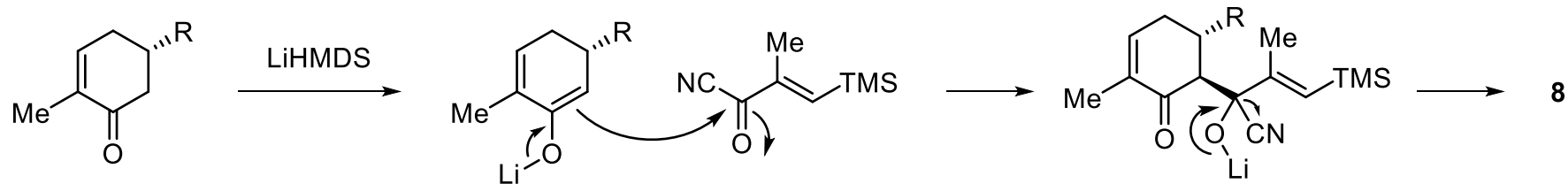


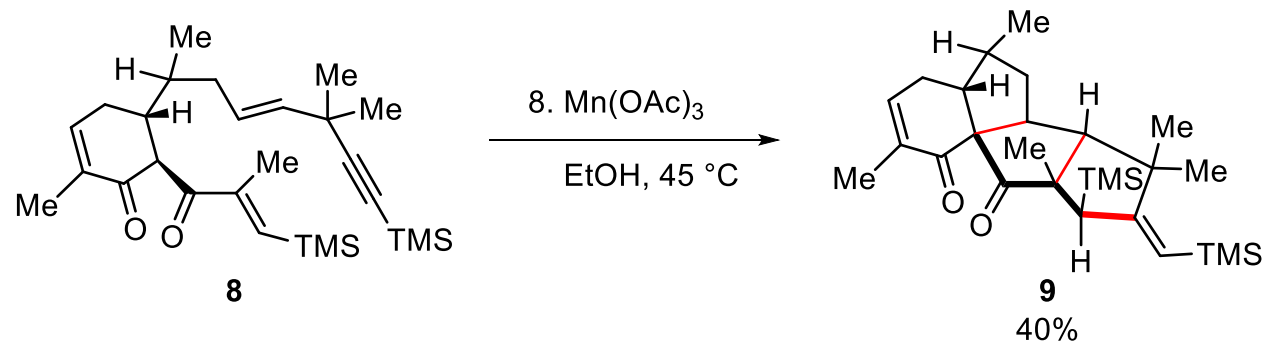


IBX oxidation of alcohol:

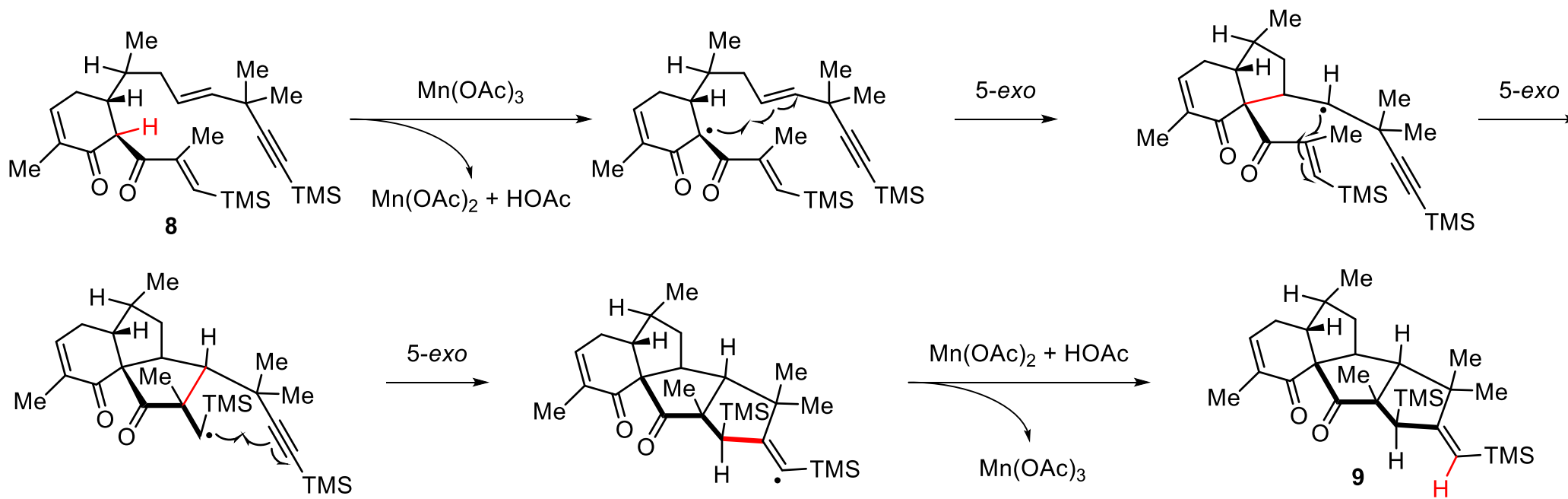


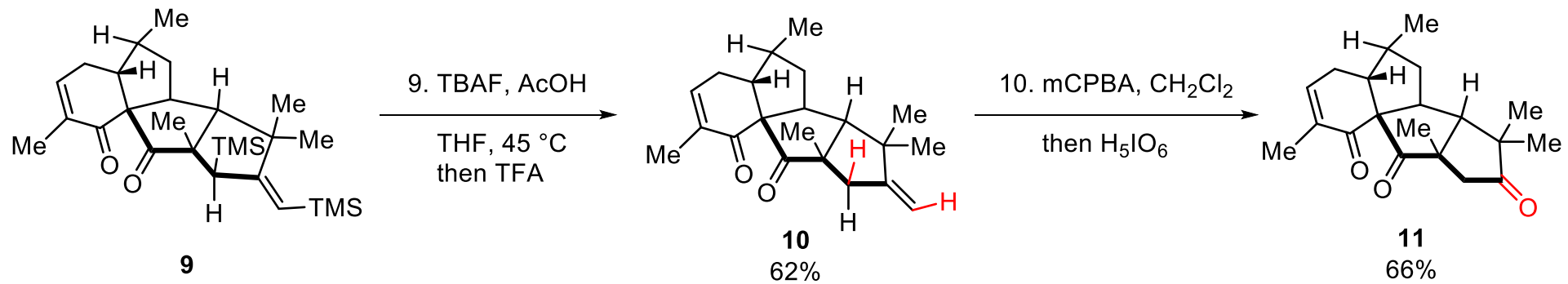
Acylation:



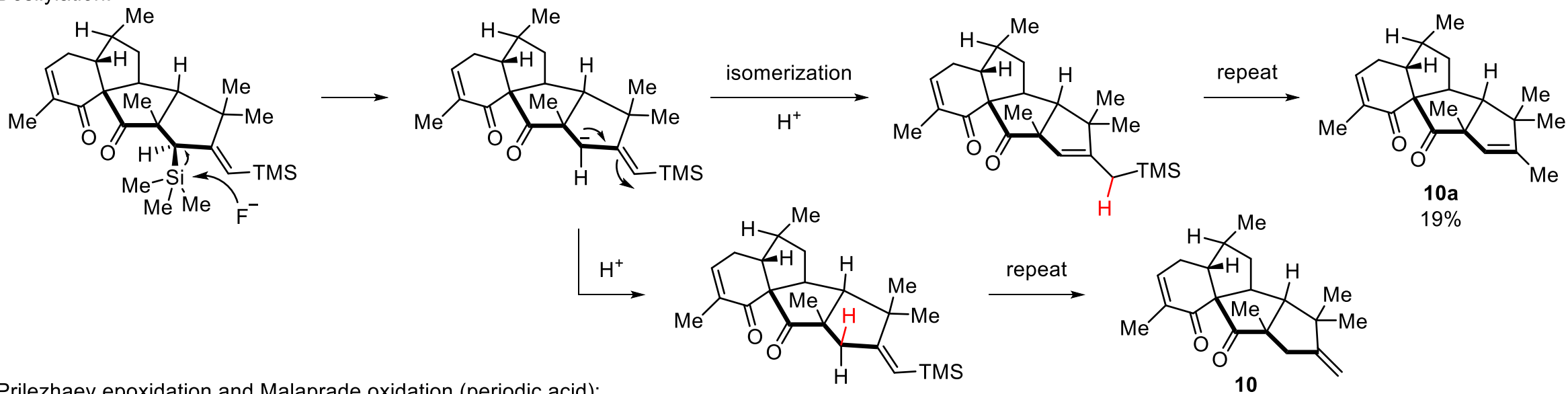


Manganese-mediated radical cascade cyclization:

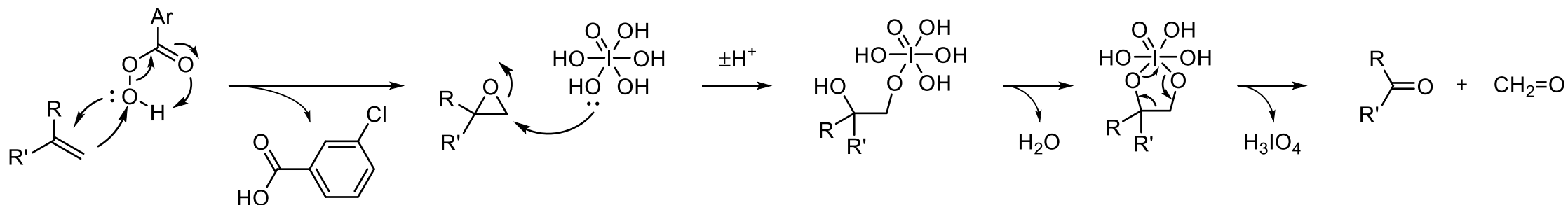


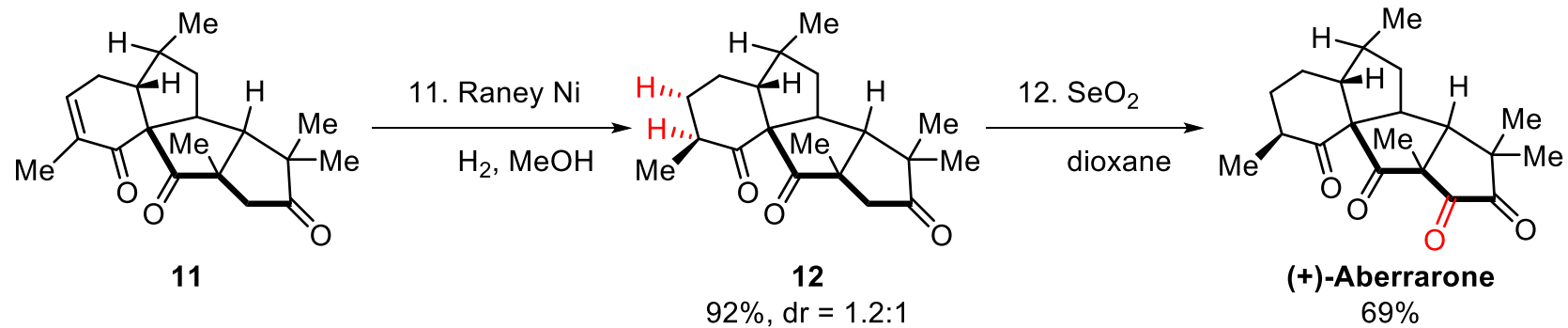


Desilylation:

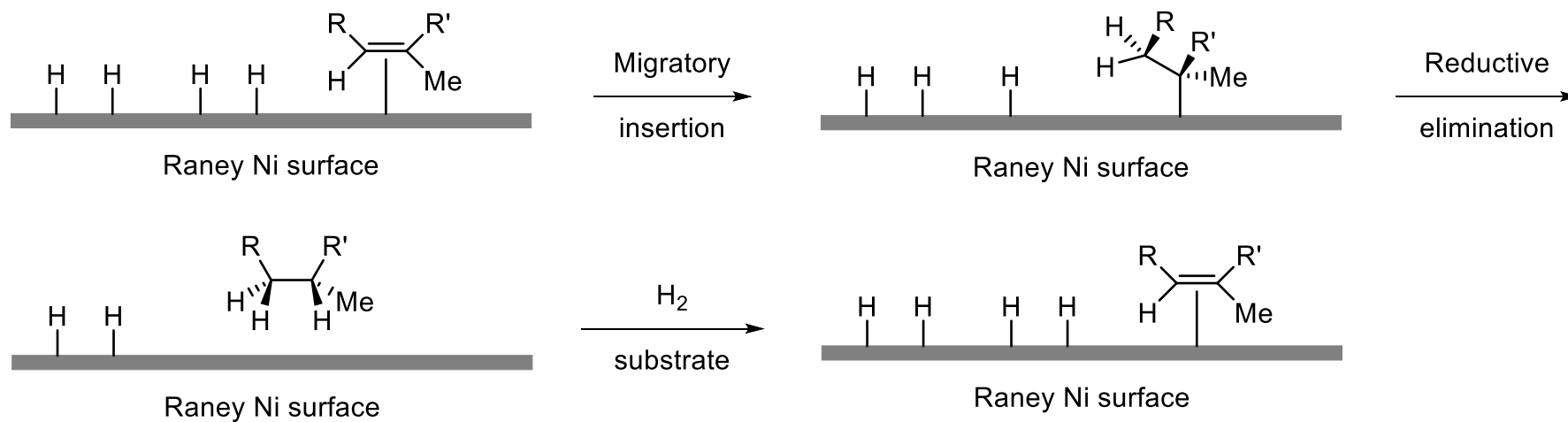


Prilezhaev epoxidation and Malaprade oxidation (periodic acid):

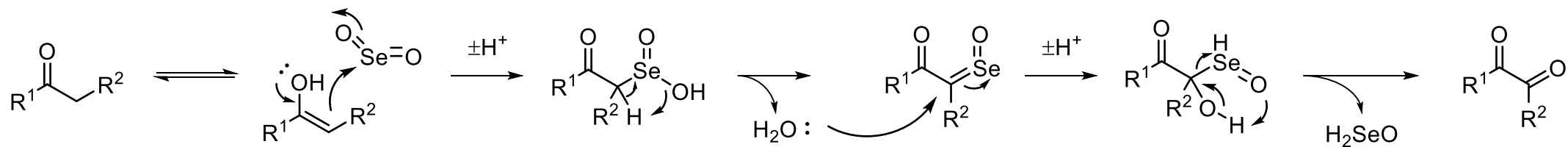




Ni-catalyzed hydrogenation:



Riley oxidation:



Thanks for your attention!