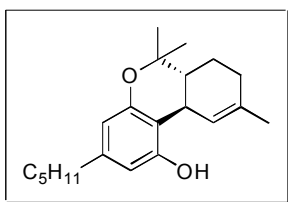


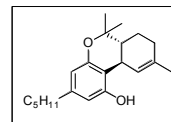
Total Synthesis of (-)- Δ^9 -trans-Tetrahydrocannabinol via Mo-Catalyzed Asymmetric Allylic Alkylation Reaction

Trost B.M.; Dogra K. *Org. Lett.* ASAP

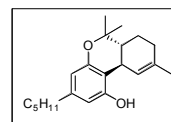


Overview

- Introduction
- Previous Syntheses
- Retrosynthetic Scheme
- Synthetic Scheme and Key Reactions
- Conclusion



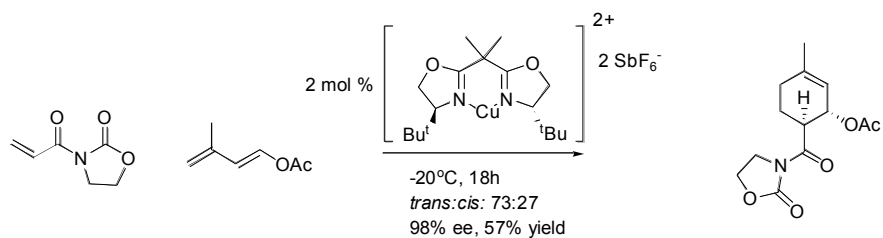
- (-)- Δ^9 -trans-Tetrahydrocannabinol (Δ^9 -THC) was first isolated in 1964 from female *Cannabis sativa* L.
- Is the primary psychomimetic component of marijuana
- Has been shown to possess analgesic properties and is used by chemotherapy patients
- Δ^9 -THC and its analogs have been shown to bind selectively to cannabinoid receptors CB1 and CB2



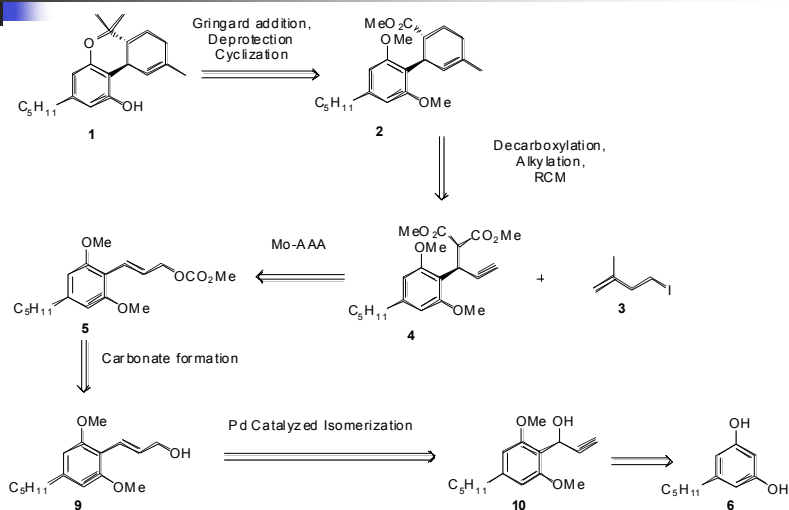
Previous Syntheses

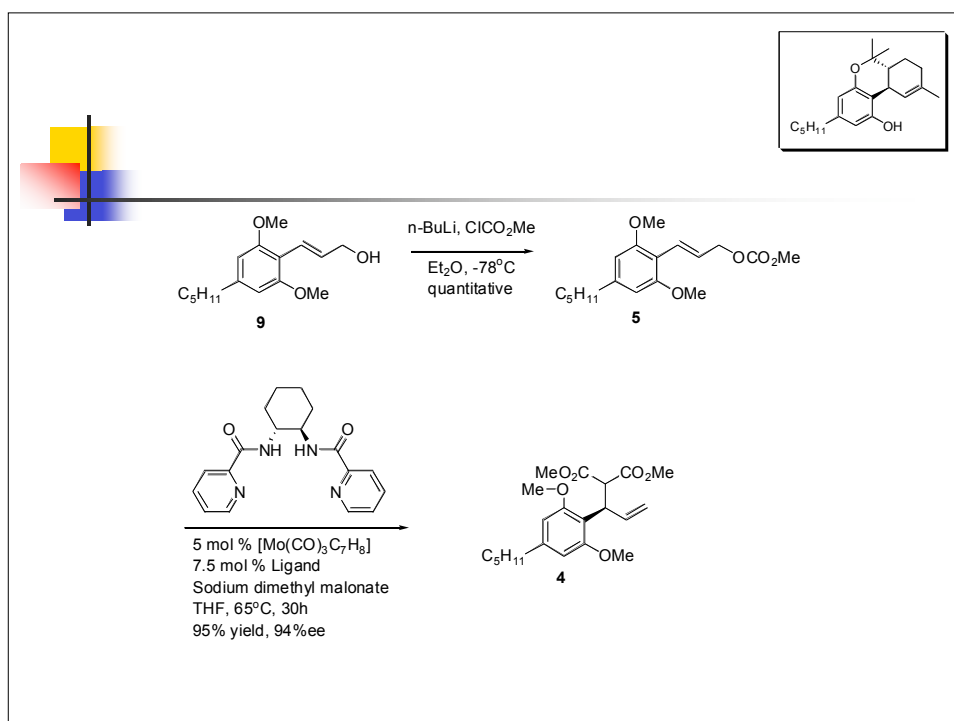
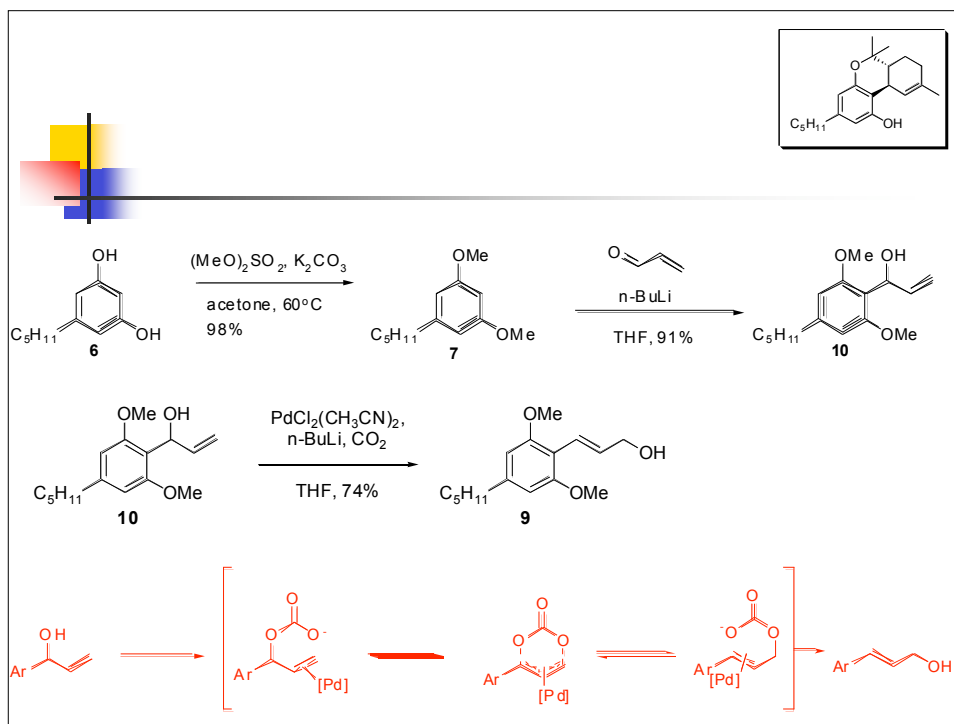
- Δ^9 -THC has been synthesized multiple times but only once from achiral starting materials (Evans et. al. *J. Am. Chem. Soc.* **1999**, 121, 7582)
- Evans' synthesis derived chirality from an asymmetric catalyzed Diels-Alder reaction
- Using these synthetic schemes, it would be difficult to produce a large number of analogs

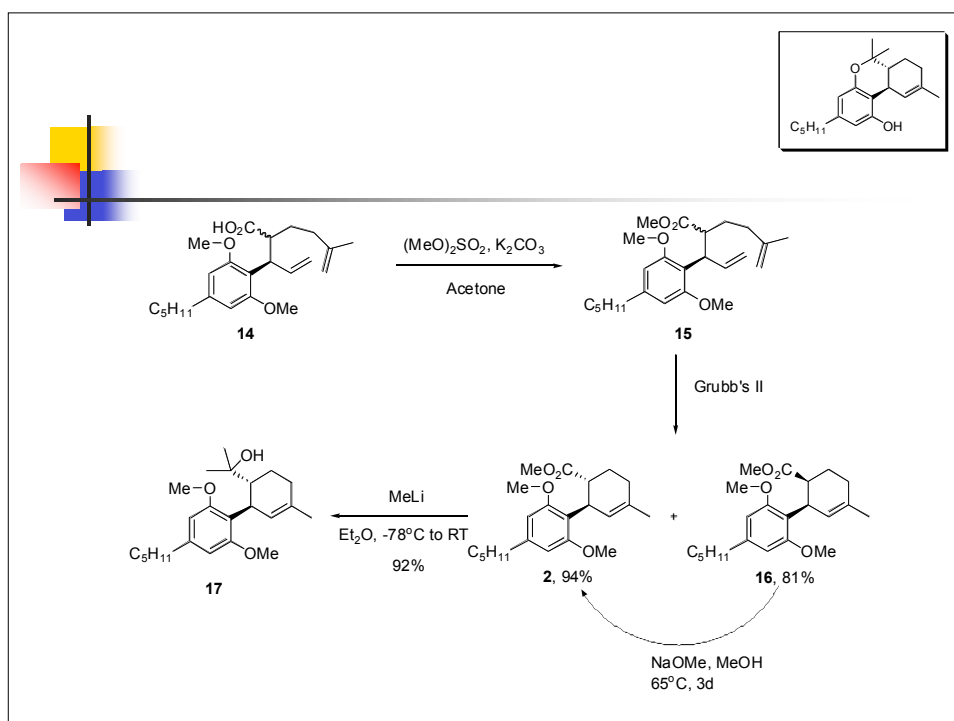
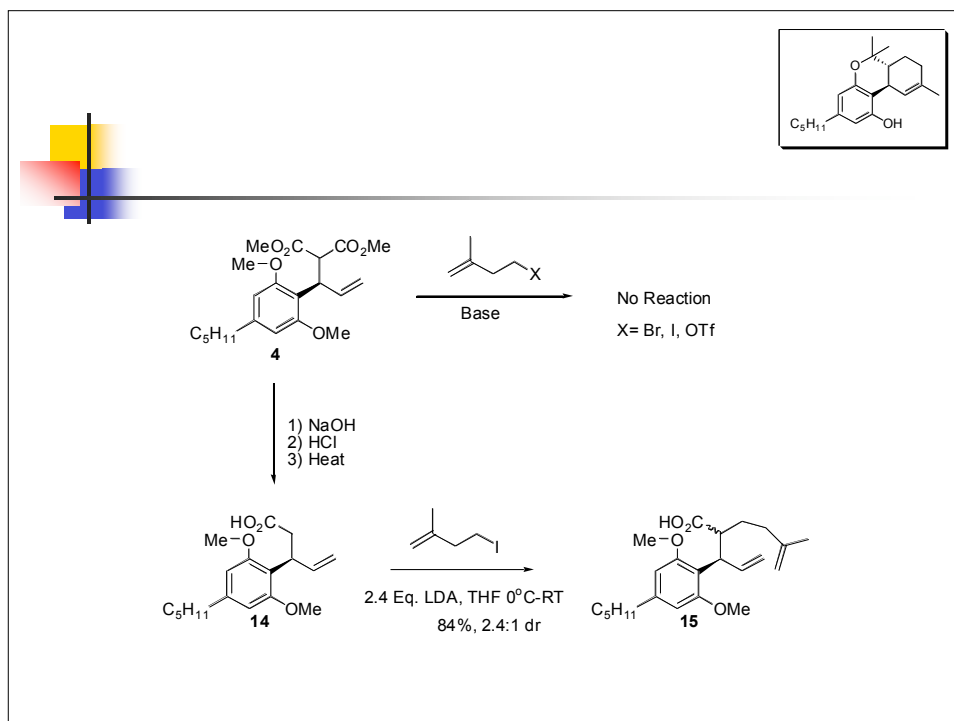
Evans' Key Step

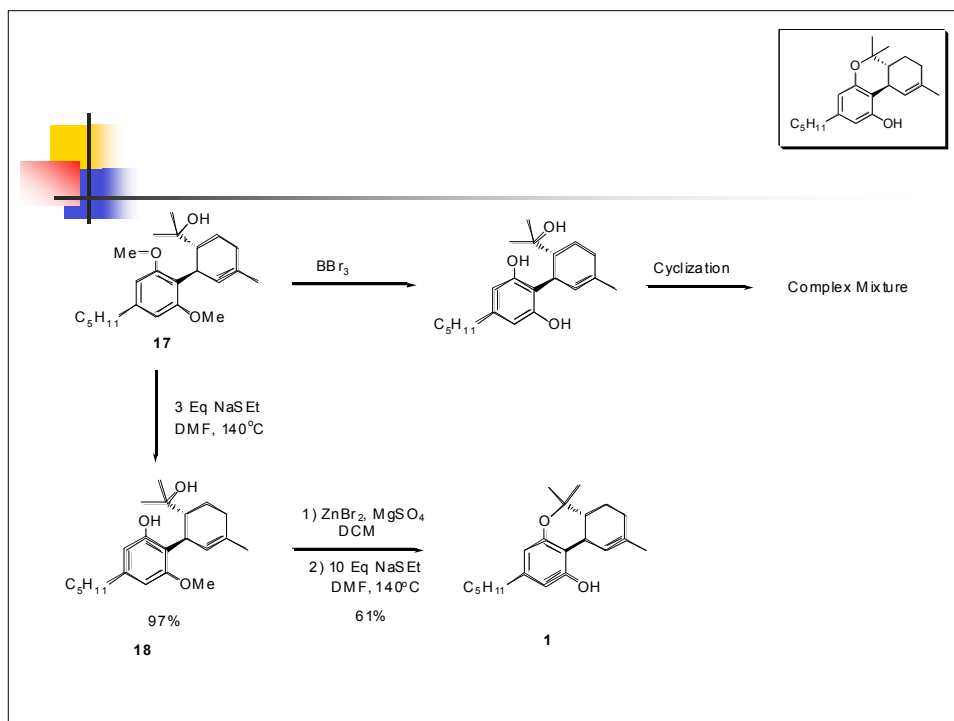


Retrosynthetic Scheme









Summary

- 13 Steps, 21% Overall yield starting from commercially available olivetol (**6**)
- Evans' Synthesis accomplished the synthetic scheme in 5 steps with 21% overall yield from the key step's starting materials
- Further demonstrates the applications of the Mo-Catalyzed Asymmetric Allylic Alkylation to total synthesis