Cr/Salen-Catalyzed Nazarov Cyclization of Dienones

Significance: Rawal and co-workers describe the highly enantioselective Cr/salen-catalyzed Nazarov cyclization of both activated and unactivated dienones, giving the desired hydridenone products with three contiguous chiral centers in moderate to good yields and stereoselectivities.

Comment: This paper represents the first example of highly enantioselective Nazarov reactions of unactivated dienones. A one-point activation mode was proposed and a counter-clockwise conrotatory cyclization would release the R group into a less sterically congested environment.

Selected examples:

- 90% yield, dr = 3.1, 90%/96% ee
- 71% yield, dr = 2.2:1, 92%/94% ee
- 69% yield, dr = 5.5:1, 80%/80% ee
- 60% yield, dr > 20:1, 90% ee
- 62% yield, dr > 8:1, 80% ee

Tandem Nazarov cyclization–azination reaction:

Proposed transition state: