An eight-step gram-scale synthesis of (−)-jiadifenolide

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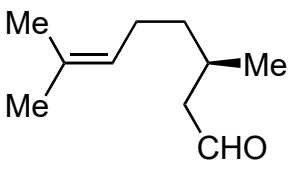


1-4

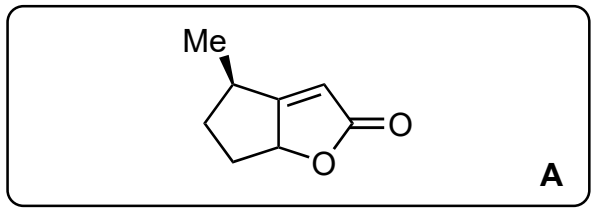
1. $P(OPh)_3$, Br_2, TEA
2. *t*-BuOK, 18-Crown-6, 70°C
3. O_3, -78°C
4. $Mo(CO)_6$, Bu_4NBr, 90°C

1. Name the starting material.

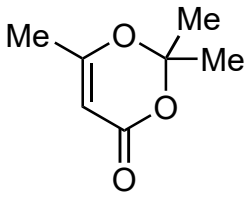
(+)-citronellal

4. Name the reaction.

hetero-Pauson-Khand reaction

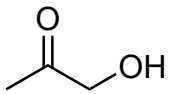


A



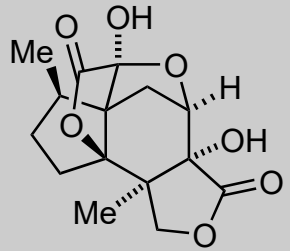
5-6

5. **1**, 120°C
6. SiO_2



1

5. *Hint: an acylketene intermediate is generated.*

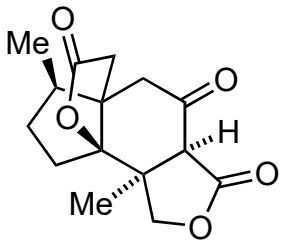


B

(−)-jiadifenolide

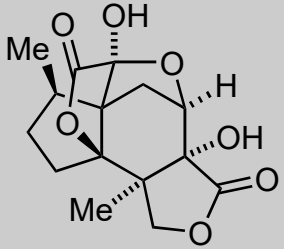
A + B

7



C

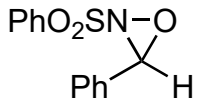
8-11



(−)-jiadifenolide

7. **A**, LDA, *then* **B,** *then* $Ti(Oi\text{-}Pr)_4$, LDA

8. m-CPBA
9. $Me_4NBH(OAc)_3$, AcOH
10. LDA, CBr_4
11. NaHMDS, **2**



2

7. Hint: a double Michael addition

11. Name the reagent.

Davis oxaziridine