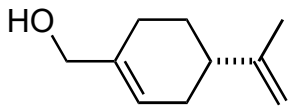
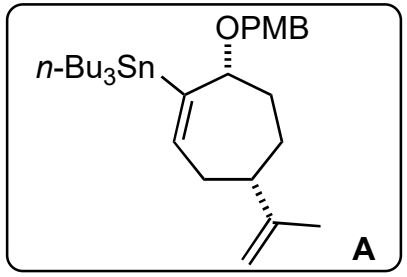
Total Synthesis of Scabrolide A and Yonarolide

R. Serrano, Y. D. Boyko, L. W. Hernandez, A. Lotuzas, D. Sarlah, *J. Am. Chem. Soc.* **2023**, *145*, 8805–8809.

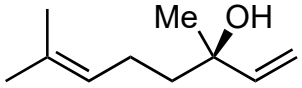


1–6



1) ZnI_2, $P(OEt)_3$, 140 °C
2) O_3, *then* Me_2S, *then* aq. K_2CO_3
3) I_2, DMAP
4) $NaBH_4$, $CeCl_3$
5) NaH, PMBCl
6) *t*-BuLi, *n*-Bu_3SnCl

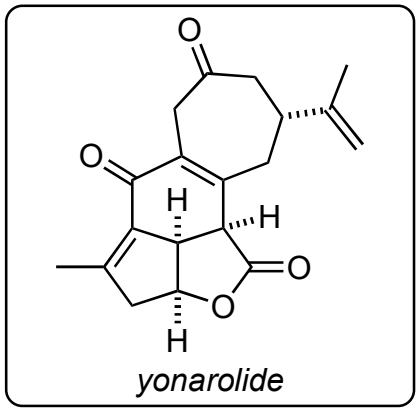
1



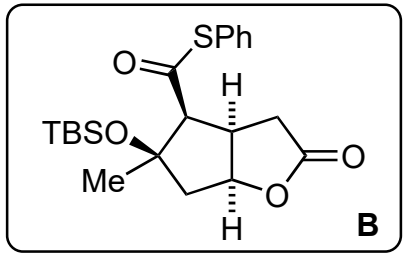
7–13

7) Hoveyda–Grubbs II, *then* NaH, TBSCl
8) $RuCl_3$ (1 mol%), *t*-BuOOH, $Mg(OAc)_2$, CH_2Cl_2, H_2O
9) $Ni(cod)_2$ (cat.), P(*m*-tol)$_3$ (cat.), BEt_3 (cat.), **1**
10) SeO_2, TBHP
11) $RuCl_3$, $NaIO_4$, H_2O
12) $NaBH_4$, *then* 2 M aq. citric acid
13) PhSH, DCC, DMAP

1) Name of the starting material? Perillyl alcohol
2) Name of the final reaction in step 2? Horner–Wadsworth–Emmons olefination
4) Name of the reaction? Luche reduction
7) Name of the starting material? Linalool
Structure of Hoveyda–Grubbs II? see below
9) Hint: BEt_3 acts as a Lewis acid. The regioselectivity of methylene-cyclopropane opening can be changed using Pd(0) (see also: *Tetrahedron Lett.* **1988**, *29*, 4539–4542).
10) Name of the reaction? Riley oxidation
11) Name of the reaction? Lemiux–Johnson oxidation



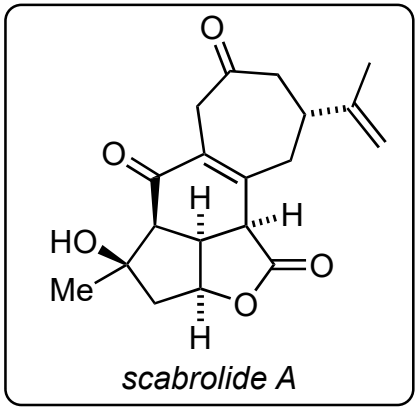
yonarolide



14–18

14) $Pd_2(dba)_3$, CuDPP, P(*o*-furyl)$_3$, **A**
15) LDA, ZnI_2
16) DBU, O_2, $P(OMe)_3$
17) PCC, SiO_2
18) TASF, H_2O

14) Name of the reaction?
Liebeskind–Srogl coupling
Structure of DPP? see below
15) Hint: Two transformations occur.
17) Name of the reaction? Babler–Dauben oxidation
Hint: An additional olefin isomerization occurs.
18) Structure of TASF? see below



scabrolide A

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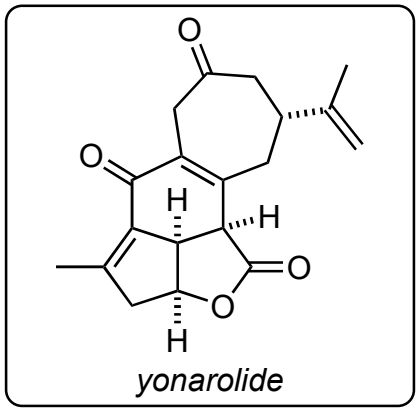
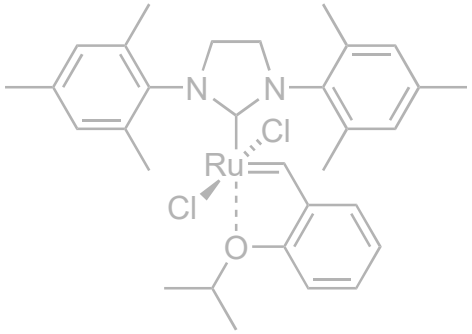
19) Burgess reagent

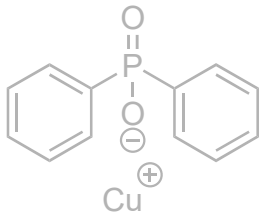
19) Structure of Burgess reagent? see below



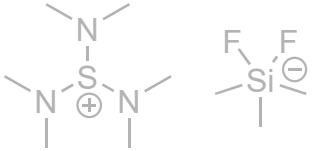
yonarolide



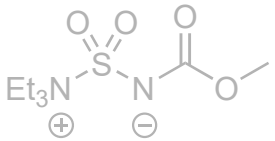
Hoveyda–Grubbs II



CuDPP



TASF



Burgess reagent