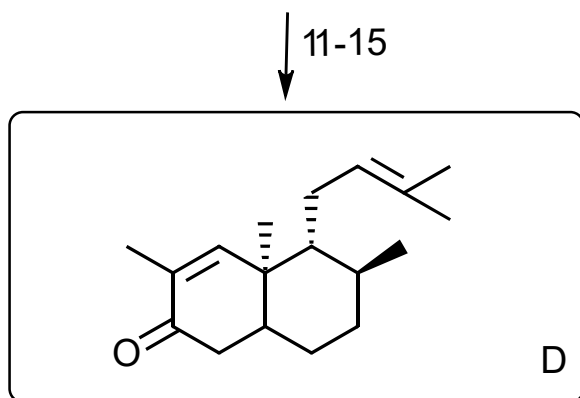
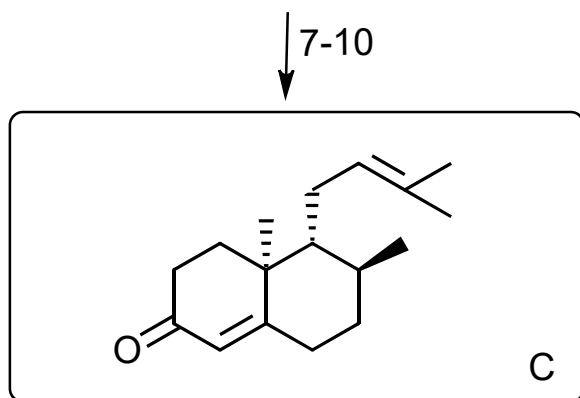
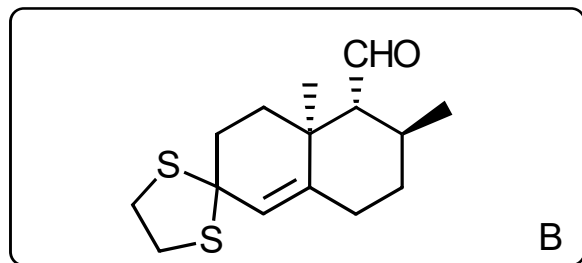
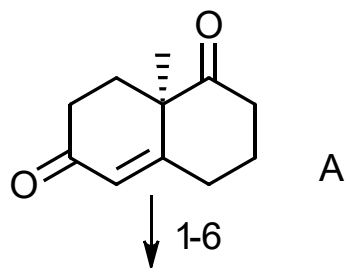


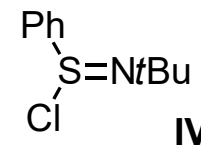
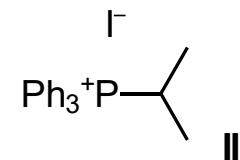
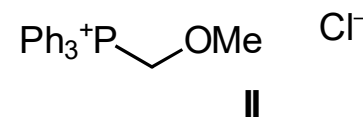
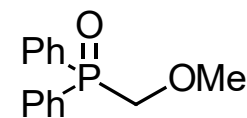
Synthesis Challenge #69

Enantioselective Total Synthesis of 3b-Hydroxy-7b-kemp-8(9)-en-6-one, a Diterpene Isolated from Higher Termites, Y. Wang, A. Jäger, M. Gruner, T. Lübken, P. Metz, *Angew. Chem. Int. Ed.* **2017**, ASAP, DOI: 10.1002/anie.201708561
23.11.2017

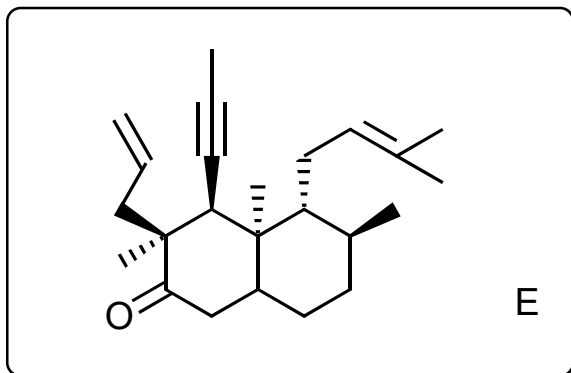


- 1) 1,2-ethanedithiol, 15 mol % CSA, HOAc, RT
- 2) a) NaHMDS, THF, -78° - 0° C, b) Et_3B , -78° C, c) MeI, -78° -RT
- 3) a) LiHMDS, THF, -78° - 0° C b) MeOH, -100° C-- -90° C
- 4) a) **I**, BuLi, THF, -78° C b) then product from 3), -78° C c) MeOH, -100° C,
- 5) NaH, DMF, 0° -RT
- 6) TFA, CH_2Cl_2 , H_2O , 0° -RT
- 7) a) **II**, NaHMDS, THF, -50° - 0° C b) **B**, 0° -RT
- 8) TFA, CH_2Cl_2 , H_2O , 0° -RT
- 9) a) **III**, BuLi, THF, -7° C b) Product from 9), -7° - 0° C
- 10) $\text{Cu}(\text{BF}_4)_2 \cdot x\text{H}_2\text{O}$, MeCN, CH_2Cl_2 , 0° -RT
- 11) a) NaHMDS, THF, -78° C - 0° C b) Et_3B , -70° C c) MeI, -70° C-RT
- 12) a) LiHMDS, THF, -78° C- 0° C b) MeOH, -100° C-- -90° C
- 13) Li, NH_3 , *t*BuOH, Et_2O , -78° C
- 14) TMSI, HMDS, MeCN, RT
- 15) a) MeLi, THF, 0° C b) **IV**, -78° C

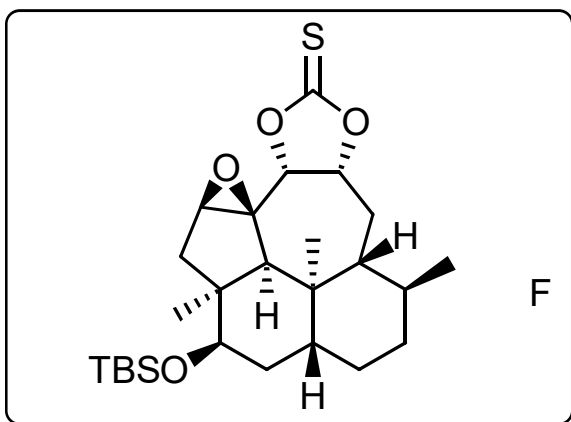
Please provide a synthesis for A.



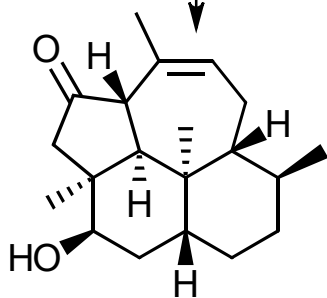
↓ 16-19



↓ 20-25



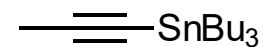
↓ 26-31



- 16) a) **V**, BuLi, THF, -78°C
- b) Me_3Al , -78°C ,
- c) then **D**, TBSOTf, -100°C -- -80°C
- 17) a) 38% aq. HF, MeCN, CH_2Cl_2
- b) 2 N HCl, RT
- 18) a) MeLi, THF, 0°C
- b) allyl iodide, HMPA, -30°C - 0°C
- 19) toluene, 120°C (sealed tube)

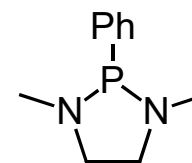
- 20) L-selectride, THF, -78°C -RT
- 21) 3 mol % Grubbs II, CH_2Cl_2 , reflux
- 22) TBSOTf, 2,6-lutidine, CH_2Cl_2 ,
- 23) OsO_4 , 3,5-lutidine, THF, toluene
- 24) 1,1,1-trifluoroacetone, oxone, NaHCO_3 , $(\text{Na})_2\text{EDTA}$, DMM, MeCN, H_2O , 0°C ,
- 25) 1,1'-thiocarbonyldiimidazole, DMAP, CH_2Cl_2 , RT

- 26) a) **VI**, THF, 57°C
- 27) silica gel, pentane/ Et_2O (20:1-9:1)
- 28) 38% aq. HF, MeCN, CH_2Cl_2 , RT
- 29) PhSH, $\text{LiOH}\cdot\text{H}_2\text{O}$, THF, 60°C
- 30) 30 % aq. H_2O_2 , HFIP, RT
- 31) $\text{P}(\text{OMe})_3$, toluene, 100°C ,



V

DMM=dimethoxymethane



VI