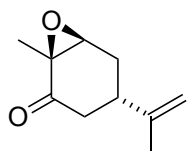
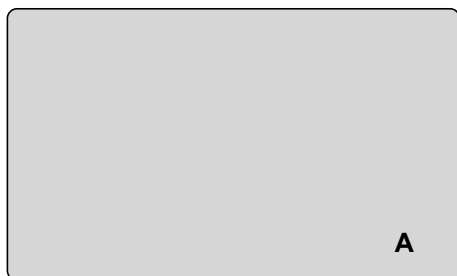


A Convergent Approach to Phragmalin-Type Limonoids: Total Synthesis of Thaigranatin P

Lee, J.; Davis, S. C.; Sheu, A.; Gu, J.; Newhouse, T. R. *J. Am. Chem. Soc.* **2025**, *147*, 36085-36089.



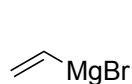
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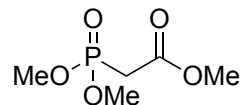
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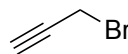
- 1) O_3 , MeOH, then PhSH, $FeSO_4 \cdot 7H_2O$
- 2) $TsNHNH_2$
- 3) **1** (3 eq), THF, $-78^\circ C$
- 4) TBSOTf, 2,6-lutidine
- 5) $CuCl_2$ (cat.), hydroxyacetone, benzene
- 6) OsO_4 (cat.), NMO *then* $NaIO_4$
- 7) **2**, NaHMDS



1



2



3

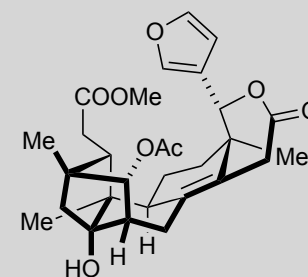
- 8) KHMDS, $ZnCl_2$, *then* CH_2O
- 9) **3**, Al, $HgCl_2$
- 10) Bu_3SnH , AIBN, *then* PPTS
- 11) $(COCl)_2$, DMSO, Et_3N
- 12) Sml_2 , MeOH, HMPA, THF, reflux
- 13) DMP
- 14) $LiBH_4$
- 15) TFA, *then* TMSCl, imidazole
- 16) DMP
- 17) $CH_2=PPh_3$
- 18) Ac_2O , pyridine

3) *Hint: syn addition.*

10) Provide a mechanism. What PPTS is needed for?

12) *Hint: draw in 3D*

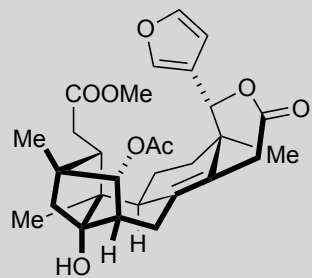
15) Excess TMSCl, imidazole used.
Product has 1 free secondary alcohol, 2 TMS-protected alcohols



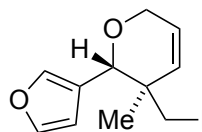
Thaigranatin P

B

18-23



Thaigranatin P



4

19) SeO_2 , H_2O , DCE, 60°C

20) **4**, $t\text{-BuLi}$, $\text{CuI}\cdot\text{Me}_2\text{S}$, then Comins' reagent

21) CrO_3 , 3,5-DMP

22) $\text{Pd}(\text{PPh}_3)_2\text{Cl}_2$, Et_3N , DMF, 100°C ,
then 1M HCl

23) Sml_2 , PhSH, HMPA, THF, reflux

22) What is the name of the reaction?