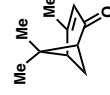
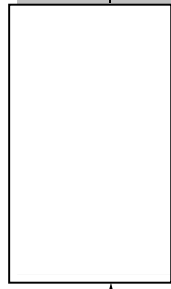


Problem Set

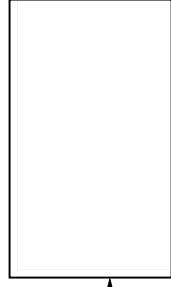
1. Please fill in the blanks (please show 3D structures and stereocenters when appropriate). *J. Am. Chem. Soc.* **1997**, 119, 2755. *J. Am. Chem. Soc.* **1997**, 119, 2757



1. prenyl bromide, KOtBu, DME
-78 °C to r.t.
2. O₃, DCM, MeOH
3. hv, MeOH

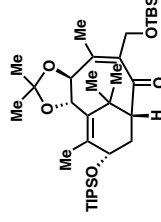
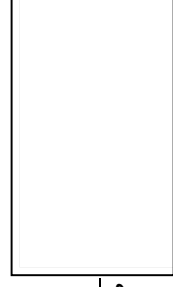


4. LDA, ethyl propionate, THF, -78 °C;
TMSCl
5. Me₂CuLi, Et₂O, -78 °C to r.t.
6. RuCl₂(PPH₃)₃, NMO, acetone
7. KHMDS, Davis' oxaziridine, THF,
-78 °C to -20 °C

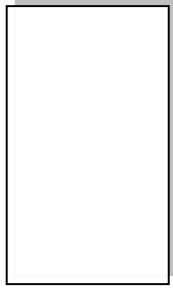


Name of starting material?
Or name of related substrate

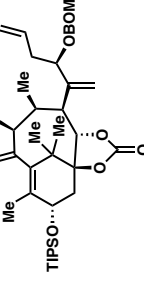
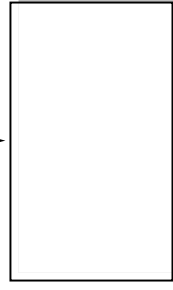
8. LAH, Et₂O
9. TBSCl, imidazole;
PPTS, 2-methoxypropene



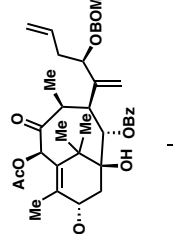
12. KOtBu, O₂, P(OEt)₃, THF, -40 °C;
NH₄Cl, MeOH; NaBH₄
13. H₂, Crabtree's cat, DCM; TMSCl, pyridine
triphosgene; PCC



14. Ph₃P=CHOMe, THF, -78 °C
15. HCl, NaI
16. TESCl, pyridine, DCM
17. DMP, DCM; Eschenmoser's salt, NEt₃



20. NH₄F, MeOH
21. PhLi, THF; Ac₂O, DMAP, pyridine
22. Triazabicyclodecene, DCM



Purpose for step 22?



Taxol (1)

Problem Set

2. Provide a reasonable mechanism for the following transformations shown below as well as the suitable reagent for the last step to arrive at taxol (1). This total synthesis came from the Li Lab.
 J. Am. Chem. Soc., 2021, 143, 17862-17870.

