Catalysis-Enabled 13-Step Total Synthesis of (−)-Peyssonnoside A

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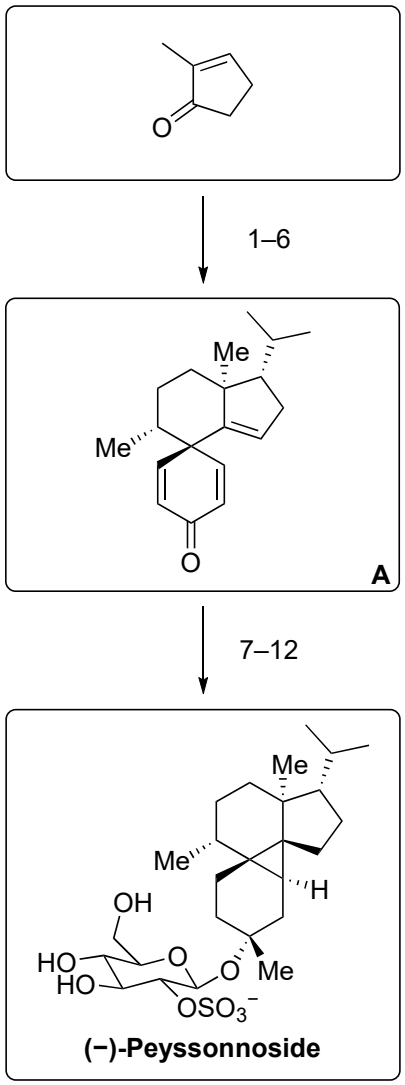
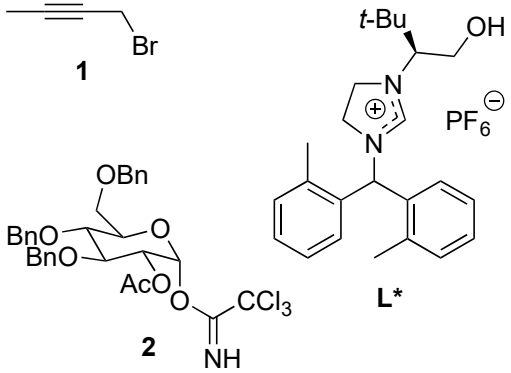
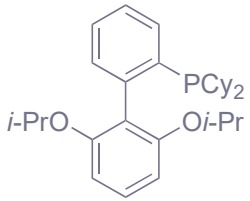


1) $Cu(OTf)_2$, *i*-PrMgBr, **L***; HMPA, **1**
2) $Pd(OAc)_2$, *p*-$MeOC_6H_4B(OH)_2$, PCy_3•HBF_4, KOAc
3) (*S*,*S*)-[(COD)Ir(Cy_2PThrePHOX)][$BAr^F{}_4$], H_2
4) KHMDS, $PhNTf_2$
5) BBr_3
6) $[Pd(cinnamyl)Cl]_2$, RuPhos, K_2CO_3



7) $Fe(acac)_3$, Ph(*i*-PrO)SiH_2, *i*-PrOH/DCM
8) Pd/C, H_2
9) $(PPh_3)_3RhCl$, $TMSCHN_2$, PPh_3, *i*-PrOH
10) $Fe(acac)_3$, $PhSiH_3$, *p*-$O_2NC_6H_4SO_3Me$
11) **2**, AgOTf
12) KOH, MeOH; py•SO_3, py; $NaHCO_3$, Amberlite
13) $Pd(OH)_2$/C, H_2

6) Give the structure of RuPhos.



9) Name the reaction.
Lebel olefination.
10) Name the reaction.
Mukaiyama hydration.
10') What is special about Studer's conditions?
Anaerobic.
11) Name the reaction.
Schmidt glycosylation.
13) Name the catalyst.
Pearlman's catalyst.