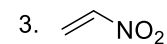


1. K_2CO_3 , allyl bromide,
acetone, reflux, **82 %**

2. 1,2-dichlorobenzene,
 $180\text{ }^\circ\text{C}$, **98 %**



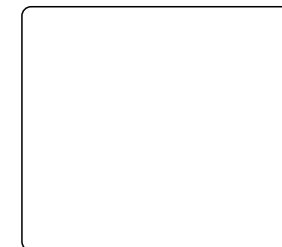
A

3. 

Takemoto cat. (1*R*, 2*R*),
3Å MS, rt, DCM, **66 %**, **94 % ee**

4. OsO_4 , NaIO_4 , 2,6-lutidine,
dioxane/water, $0\text{ }^\circ\text{C}$
then

Meldrum's acid (*structure?*)
Hantzsch ester, L-proline,
EtOH, rt, **72 %**



B

5. L-selectride, THF,
 $-78\text{ }^\circ\text{C}$, **78 %**

6. **Eschenmoser's salt**,
MeOH, $65\text{ }^\circ\text{C}$, **64 %**

Mechanism of step 6?

How to get Eschenmoser's salt?



C

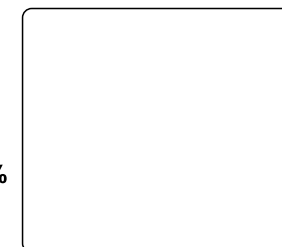
7. $\text{Na}_2\text{S}_2\text{O}_4$,
MeOH/water, $80\text{ }^\circ\text{C}$, **63 %**



D

8. Zn, AcOH, $70\text{ }^\circ\text{C}$, quant.
9. HCO_2Et , $70\text{ }^\circ\text{C}$, sealed tube

then DMP, DCM, $0\text{ }^\circ\text{C}$ to rt, **84 %**
10. NaClO_2 , $\text{NaH}_2\text{PO}_4\cdot\text{H}_2\text{O}$
2-methyl-2-butene,
THF/ H_2O /*t*-BuOH, $0\text{ }^\circ\text{C}$



E

11. DIPEA, **DPCP**, THF, $0\text{ }^\circ\text{C}$,

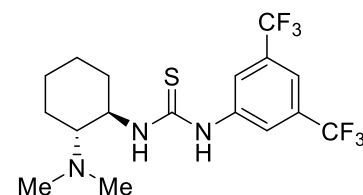
then

NaN_3 in H_2O , $0\text{ }^\circ\text{C}$
82 % over 2 steps

12. allylic alcohol, 4Å MS,
 $80\text{ }^\circ\text{C}$, **72 %**



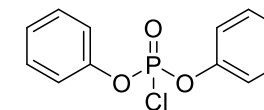
F



Takemoto catalyst (1*R*, 2*R*)



Eschenmoser's salt



**Diphenyl chlorophosphate
DPCP**

