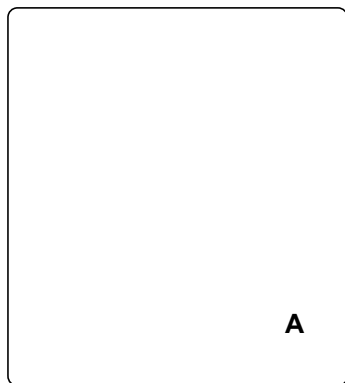


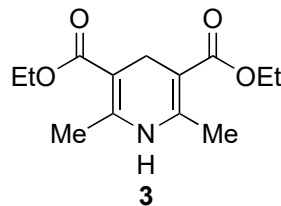
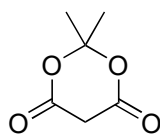
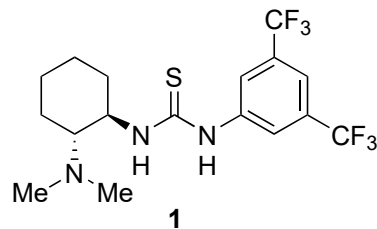
1-10



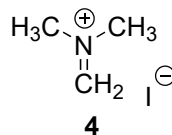
11-14



- 1) Allyl bromide, K_2CO_3
- 2) 180 °C
- 3) MeI, K_2CO_3
- 4) $PdCl_2$, $CuCl_2$, O_2 , H_2O
- 5) NaOH
- 6) Allyl bromide, K_2CO_3
- 7) 180 °C
- 8) **1**, nitroethylene
- 9) OsO_4 , $NaIO_4$, 2,6-lutidine
- 10) **2, 3**, L-Proline



- 11) L-Selectride
- 12) **4**, MeOH, 65 °C
- 13) $Na_2S_2O_4$, MeOH, H_2O , 80 °C
- 14) Zn, AcOH



1) Name of starting material?

4) Name of the reaction?

5) *Hint: dehydration also occurs*

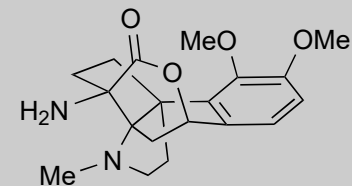
8) Name of **1**. *Hint: thiourea interacts with the nitro group, catalyzing a nucleophilic attack.*

9) Name of the reaction?

10) Name of **2** and **3**? *Hint: react first with 2. Then, 3 reduces the resulting product.*

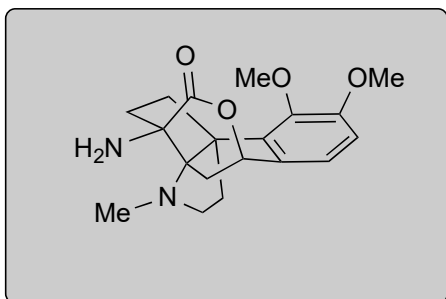
12) *Hint: Decarboxylation occurs to form an α , β -unsaturated ester*

13) *Hint: A series of transformations: reduction to hydroxylamine, then ___ with ketone, deprotonation, then ___ with alkene.*

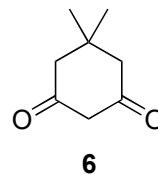
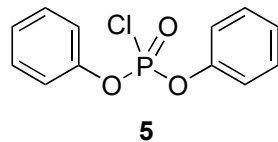


B

15-22



- 15) HCO₂Et, *then* DMP
- 16) NaClO₂, NaH₂PO₄, 2-methyl-2-butene
- 17) DIPEA, **5**, *then* NaN₃
- 18) Allyl alcohol, 80 °C
- 19) [Ir(dF(CF₃)ppy)₂(5,5'-dCF₃bpy)]PF₆,
Cu(TFA)₂(MeCN), K₂HPO₄, blue LED, air
- 20) NaBH₄, CeCl₃·7H₂O
- 21) NaH
- 22) Pd(PPh₃)₄, **6**



16) Name of the reaction?

18) Name of the reaction? *Hint: named reaction gives an isocyanate for transformation with allyl alcohol.*

19) *Hint: check product oxidation state.*