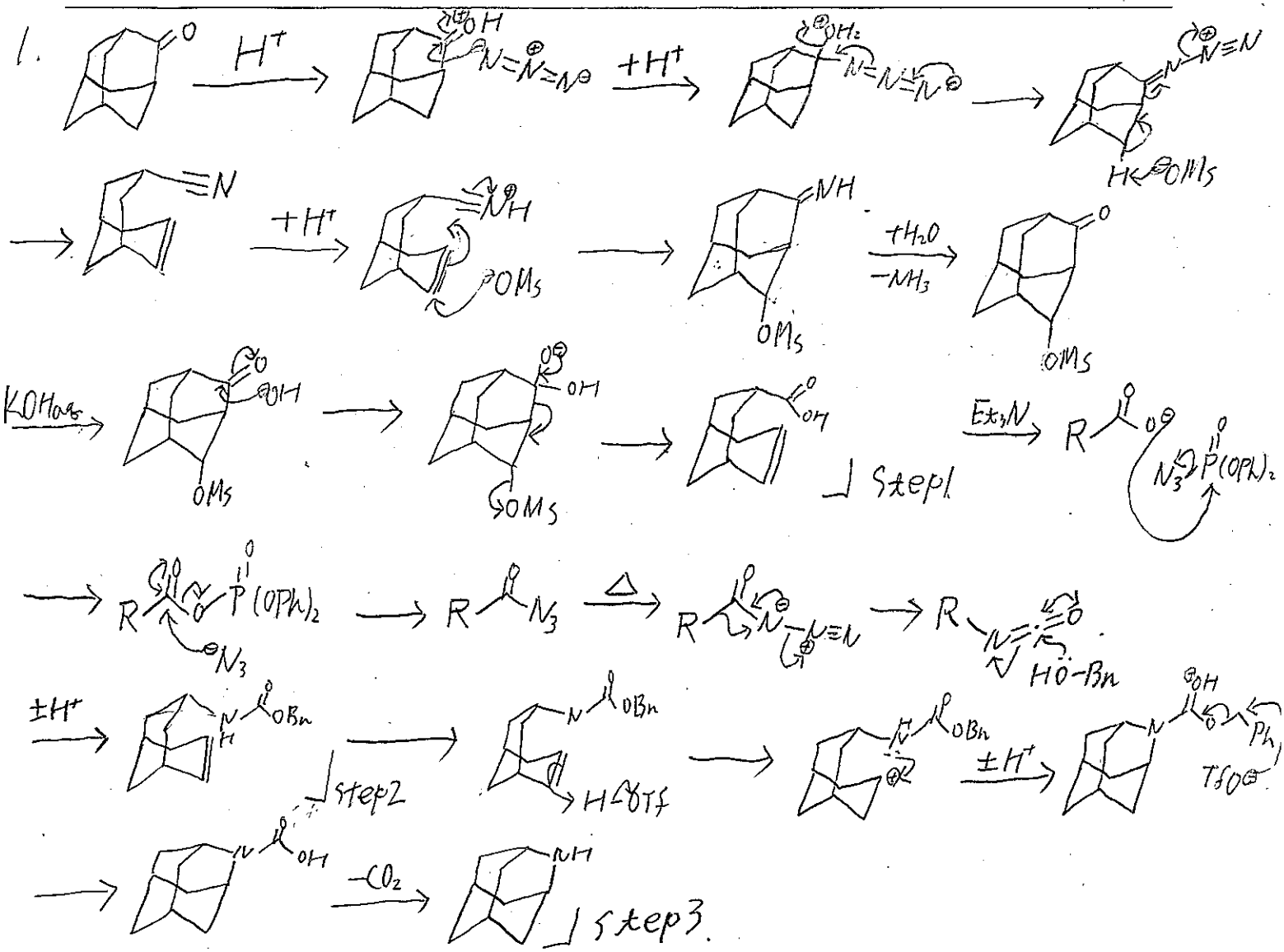
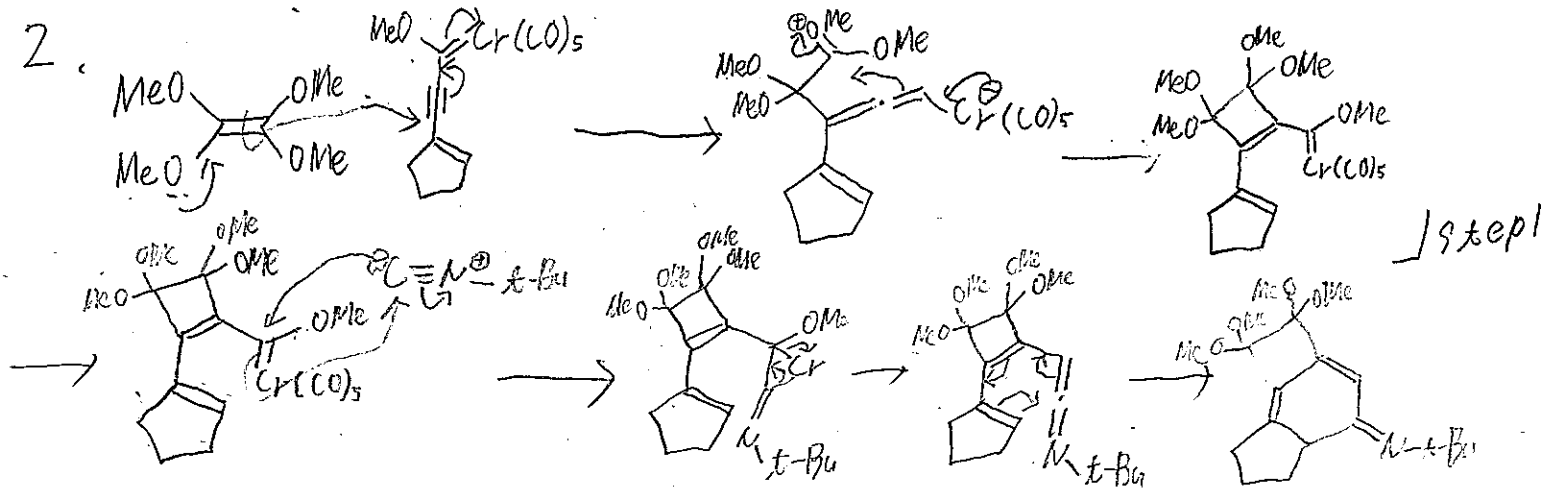
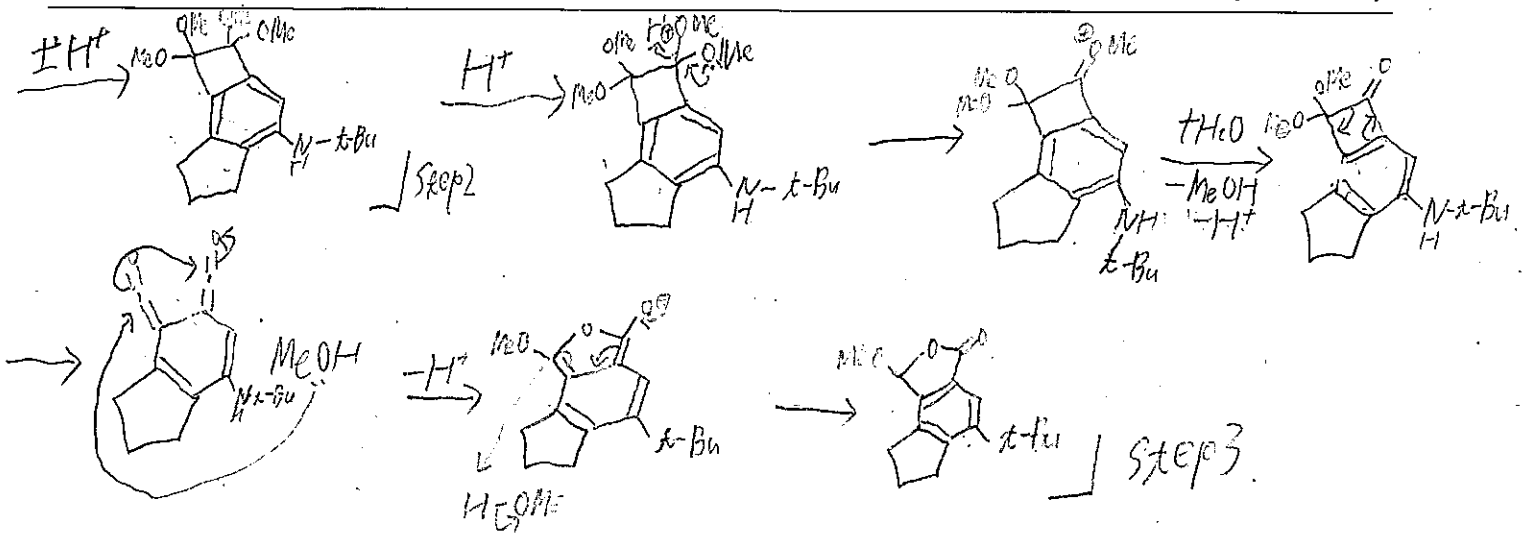
1.

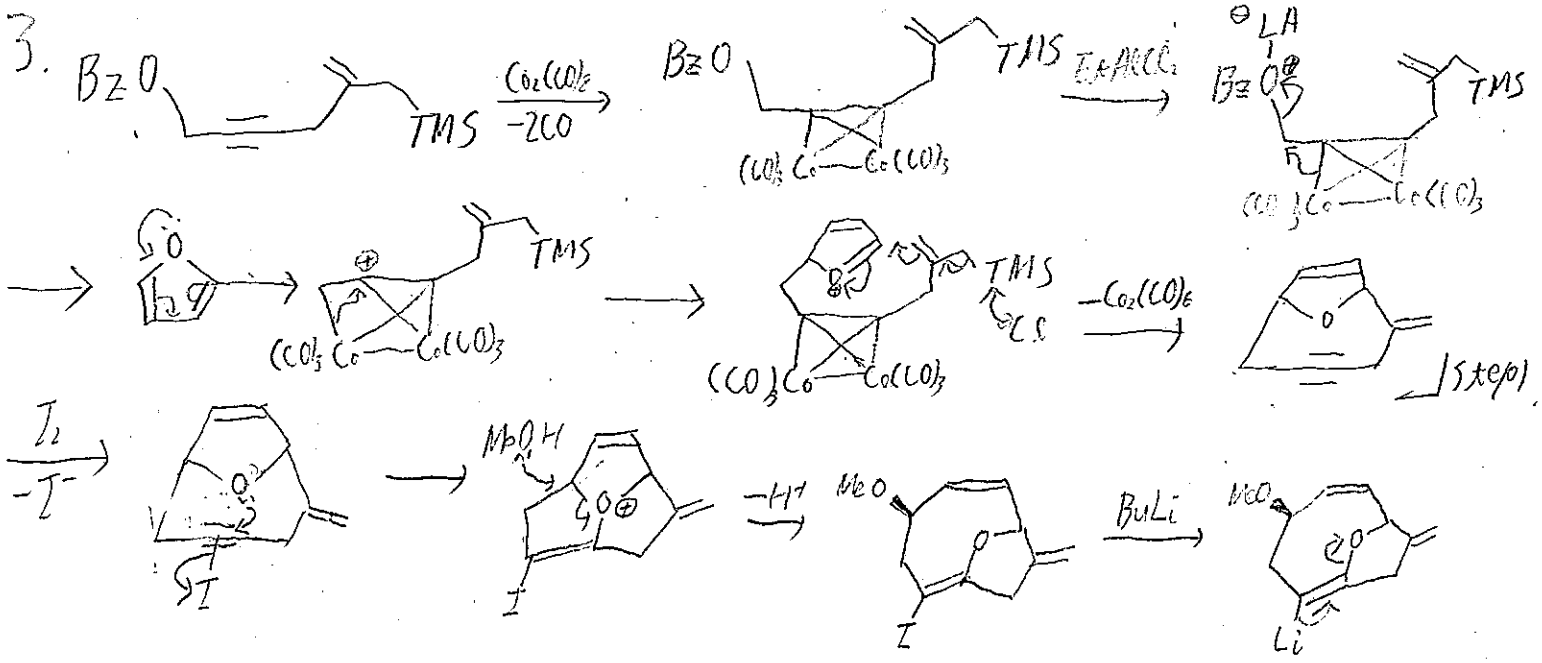


2.



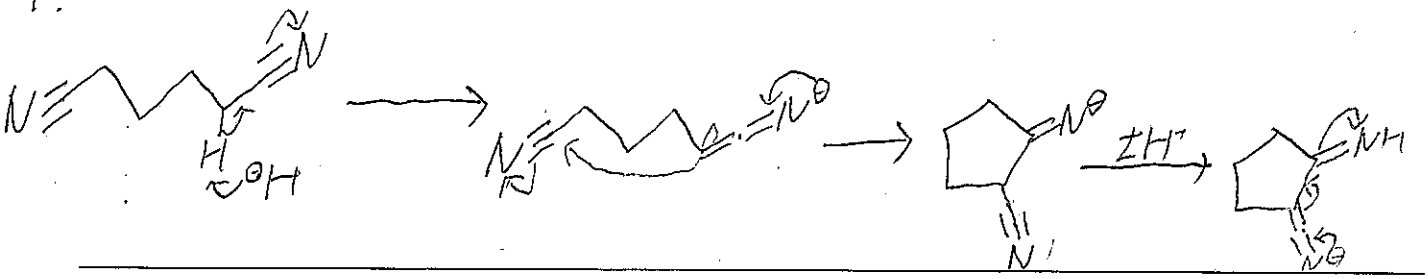

±H+
Step2
H+
+H2O
-MeOH
-H+
MeOH
-H+
Step3

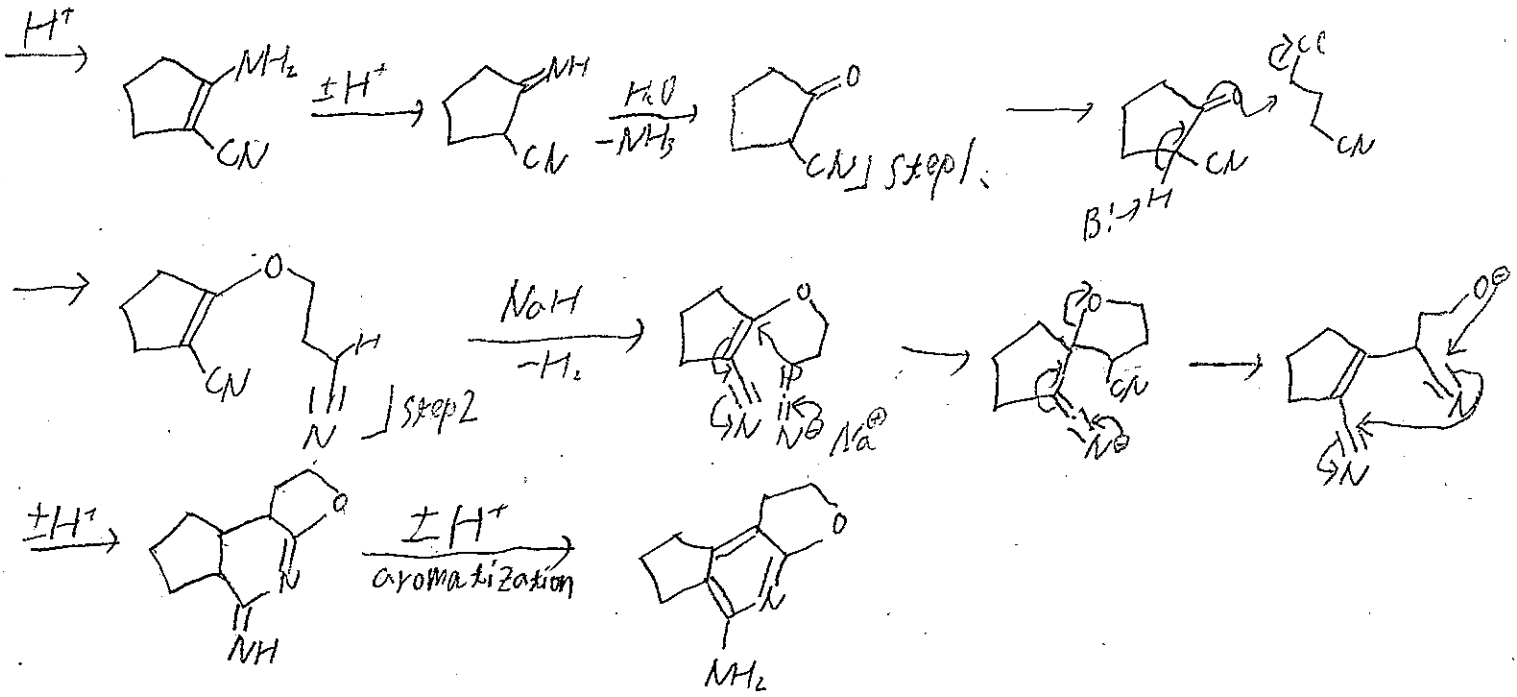
3.


BzO
TMS
Co2(CO)8
-2CO
Et2AlCl
LA
-Co2(CO)6
Step1
I2
-I-
MeOH
-H+
BuLi
Li

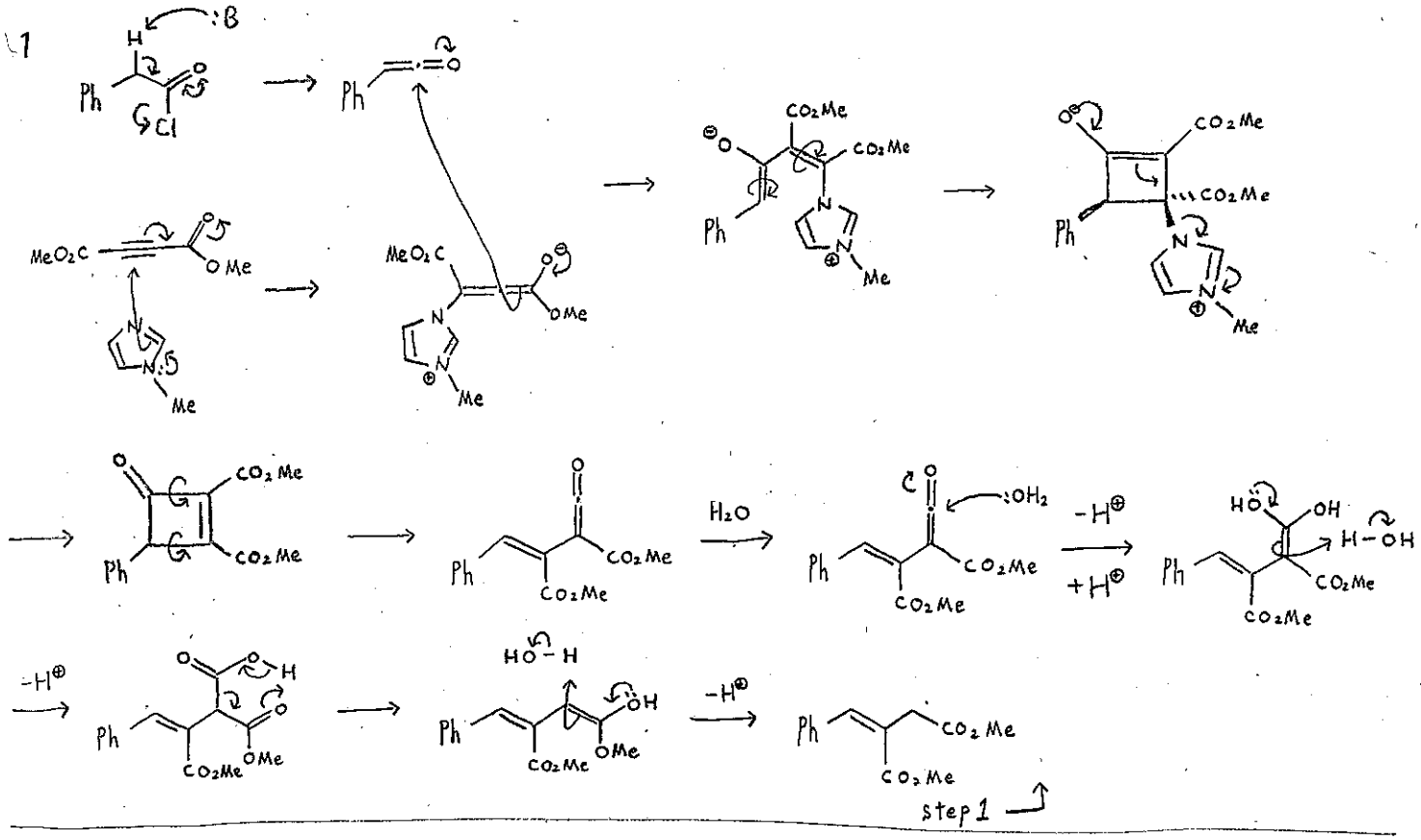
→ product.

4.

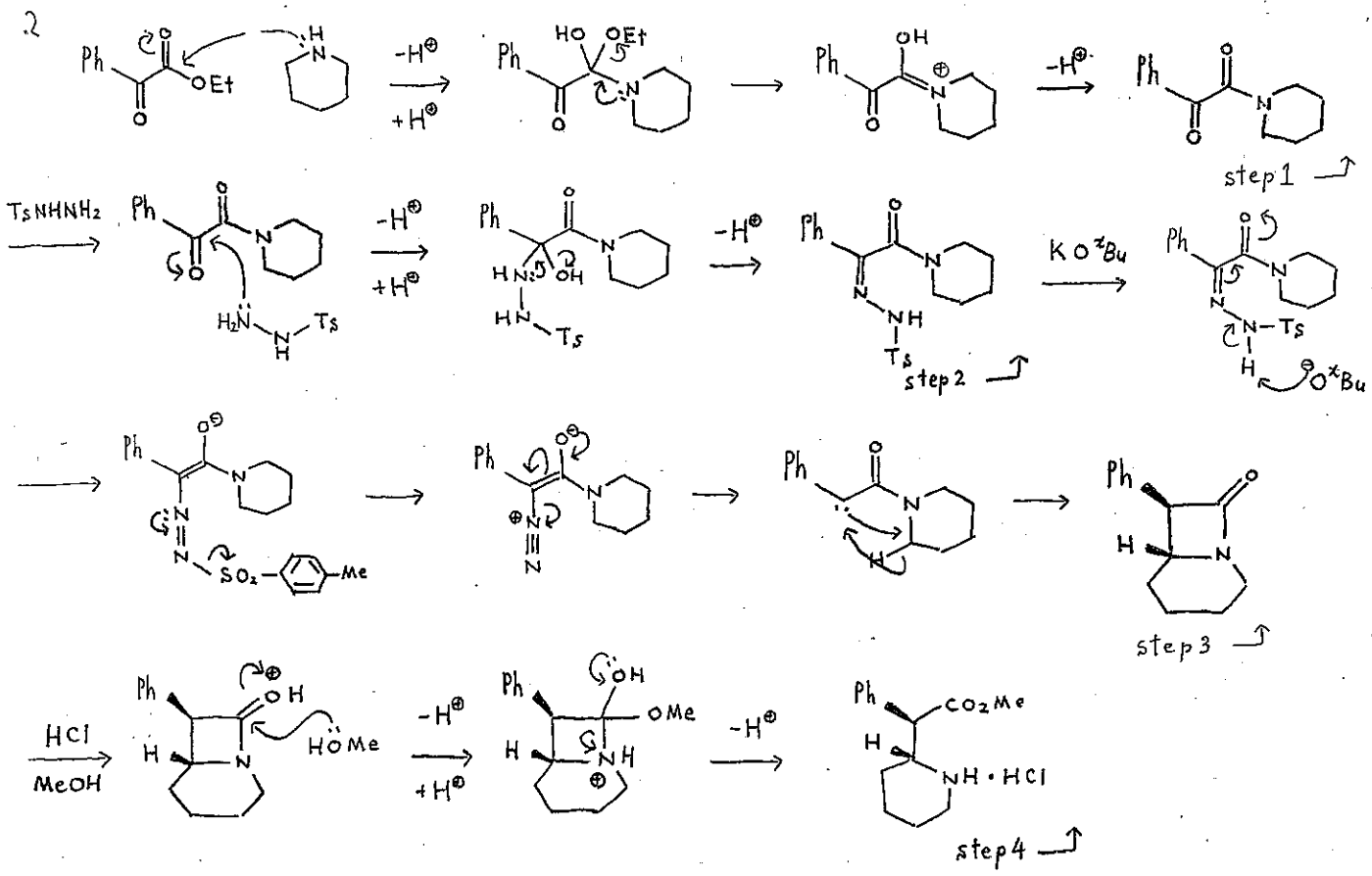

±H+


H+
NH2
CN
±H+
NH
CN
H2O
-NH3
O
CN
step1
B:→H
CN
CN
O
CN
H
N
step2
NaH
-H2
N
N⊖
Na⊕
CN
N⊖
O⊖
N
±H+
NH
±H+
aromatization
NH2

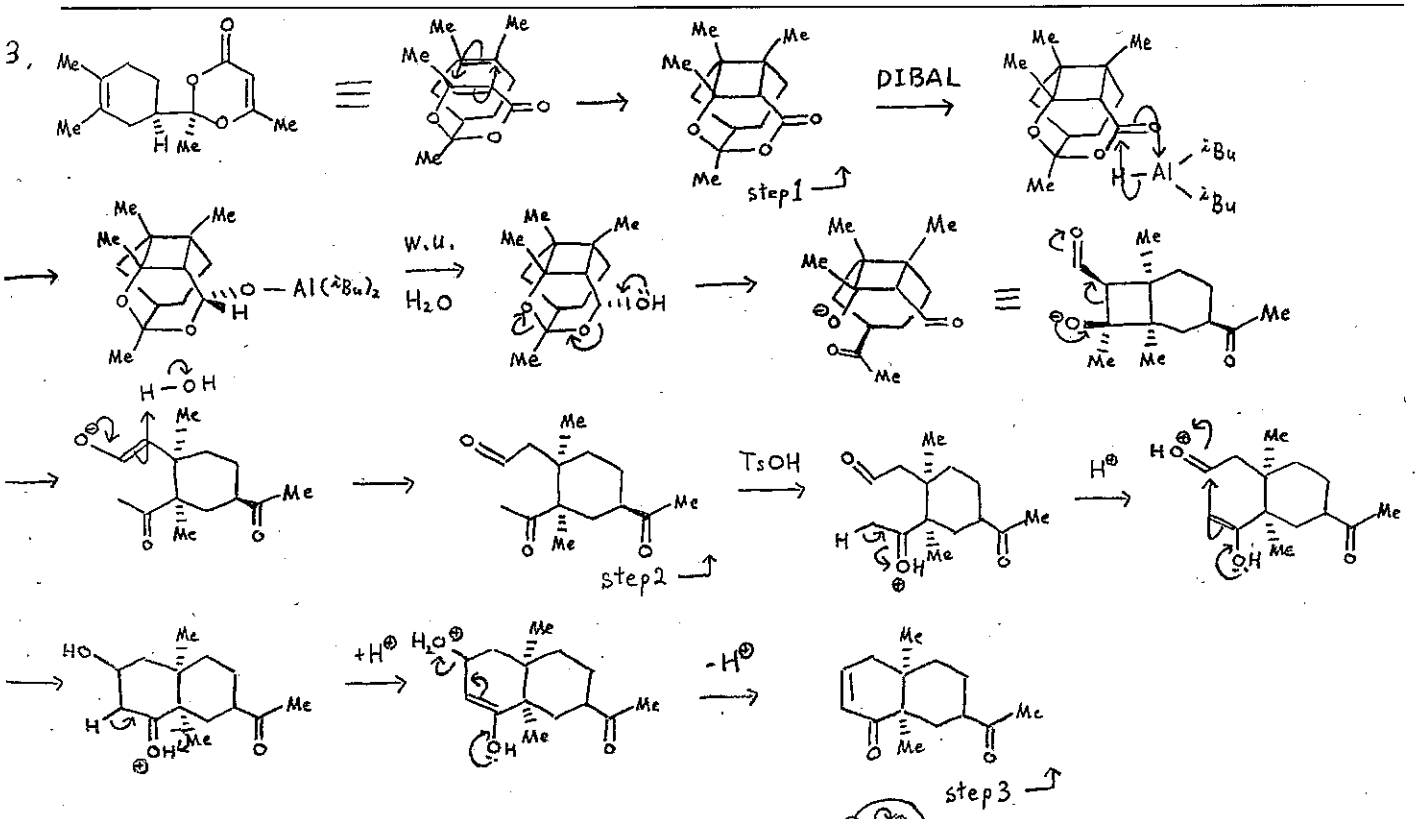
1



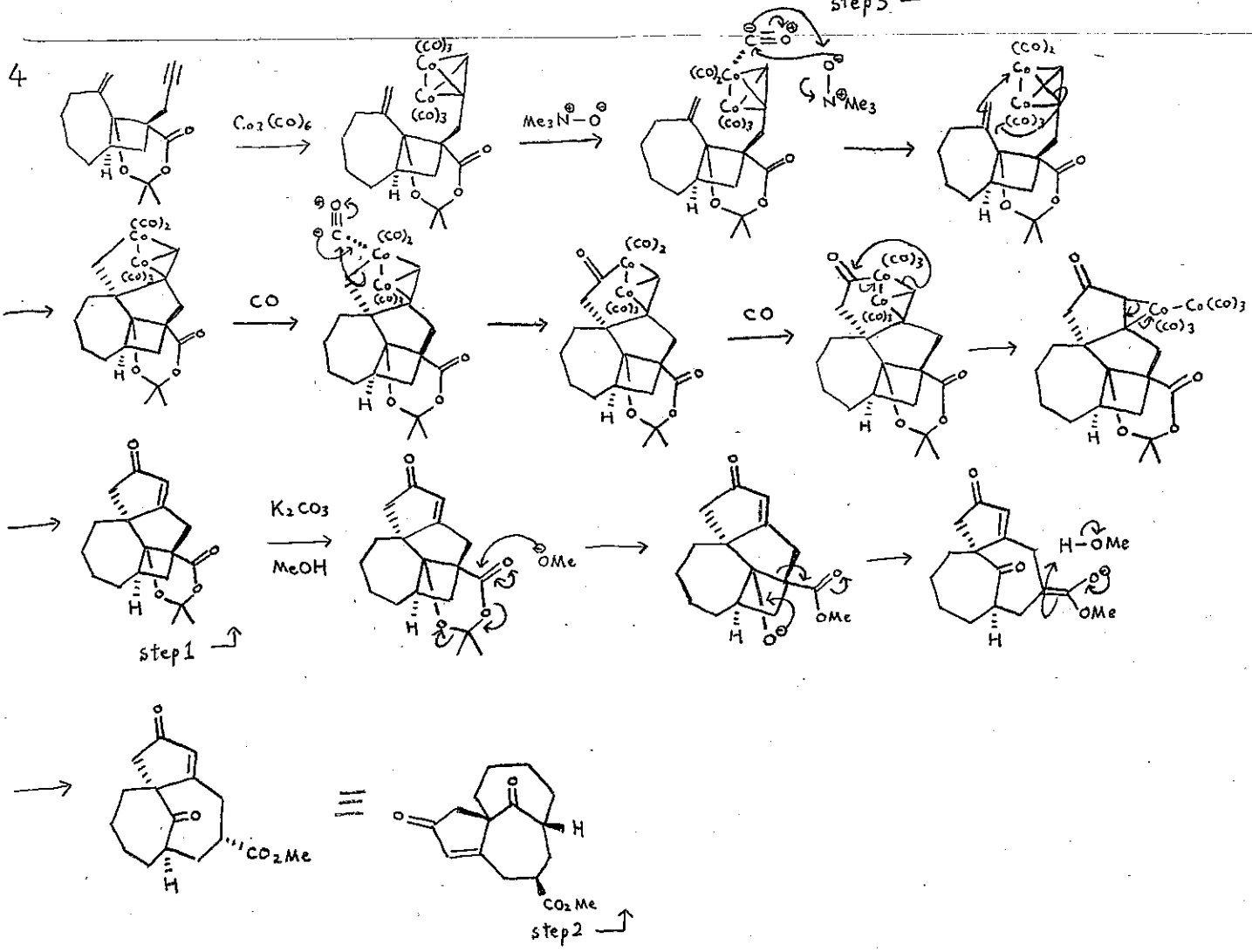
2



3.


DIBAL
step1
W.U.
H_2O
TsOH
$H^\oplus$
step2
$+H^\oplus$
$-H^\oplus$
step3

4


$Co_2(CO)_6$
$Me_3N^\oplus-O^\ominus$
CO
CO
K_2CO_3
MeOH
step1
step2