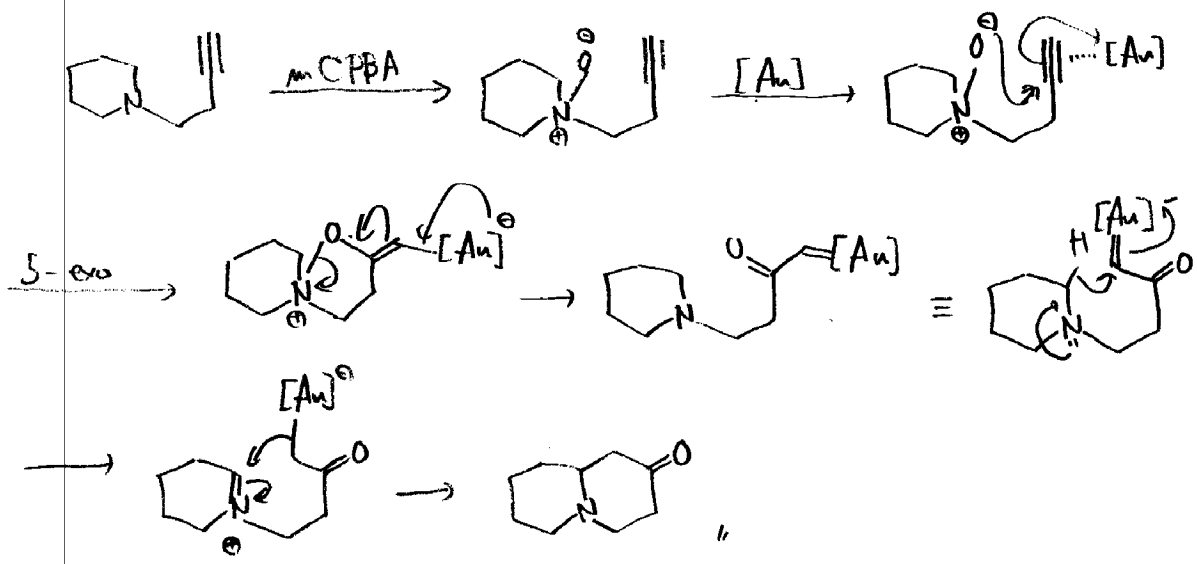
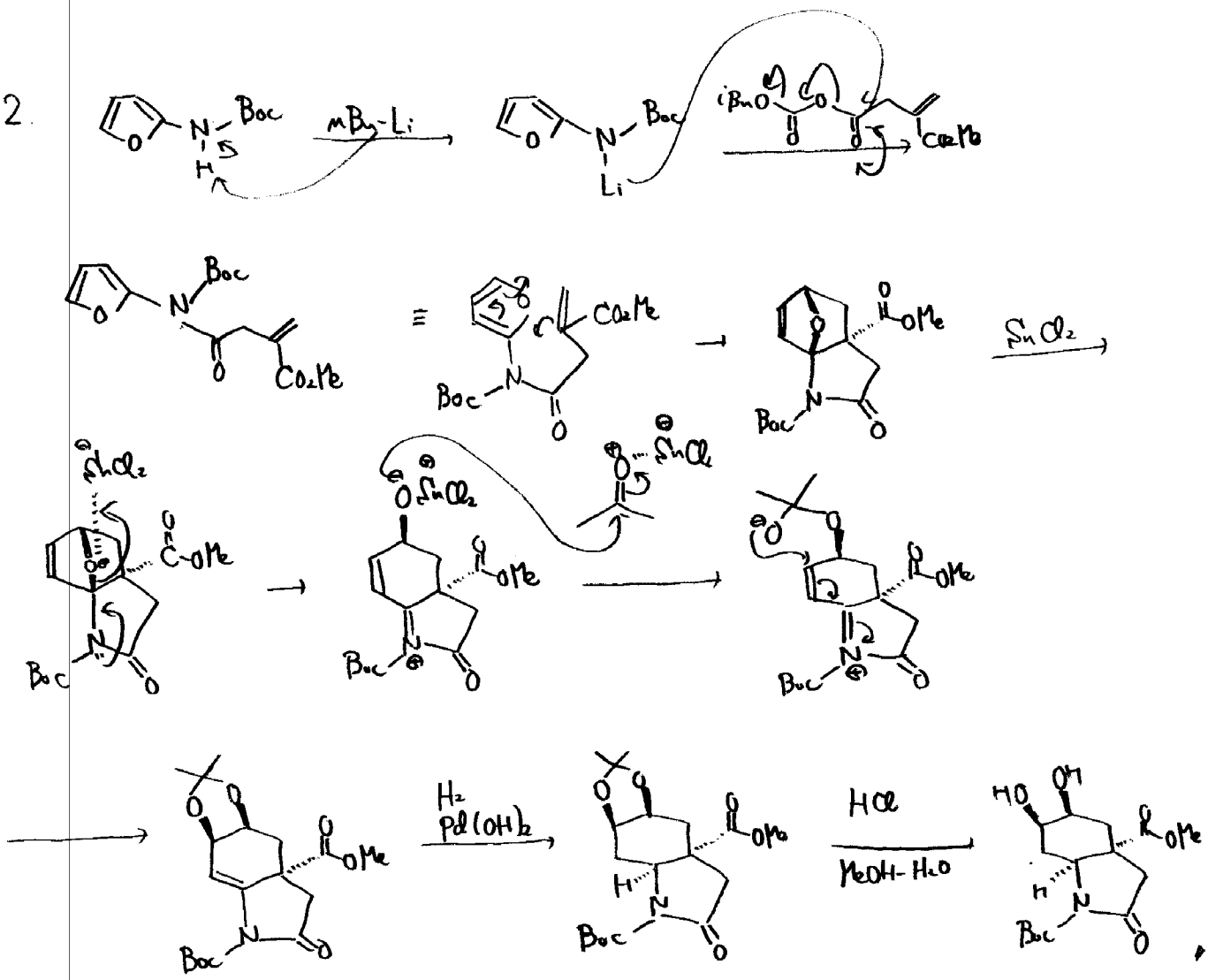
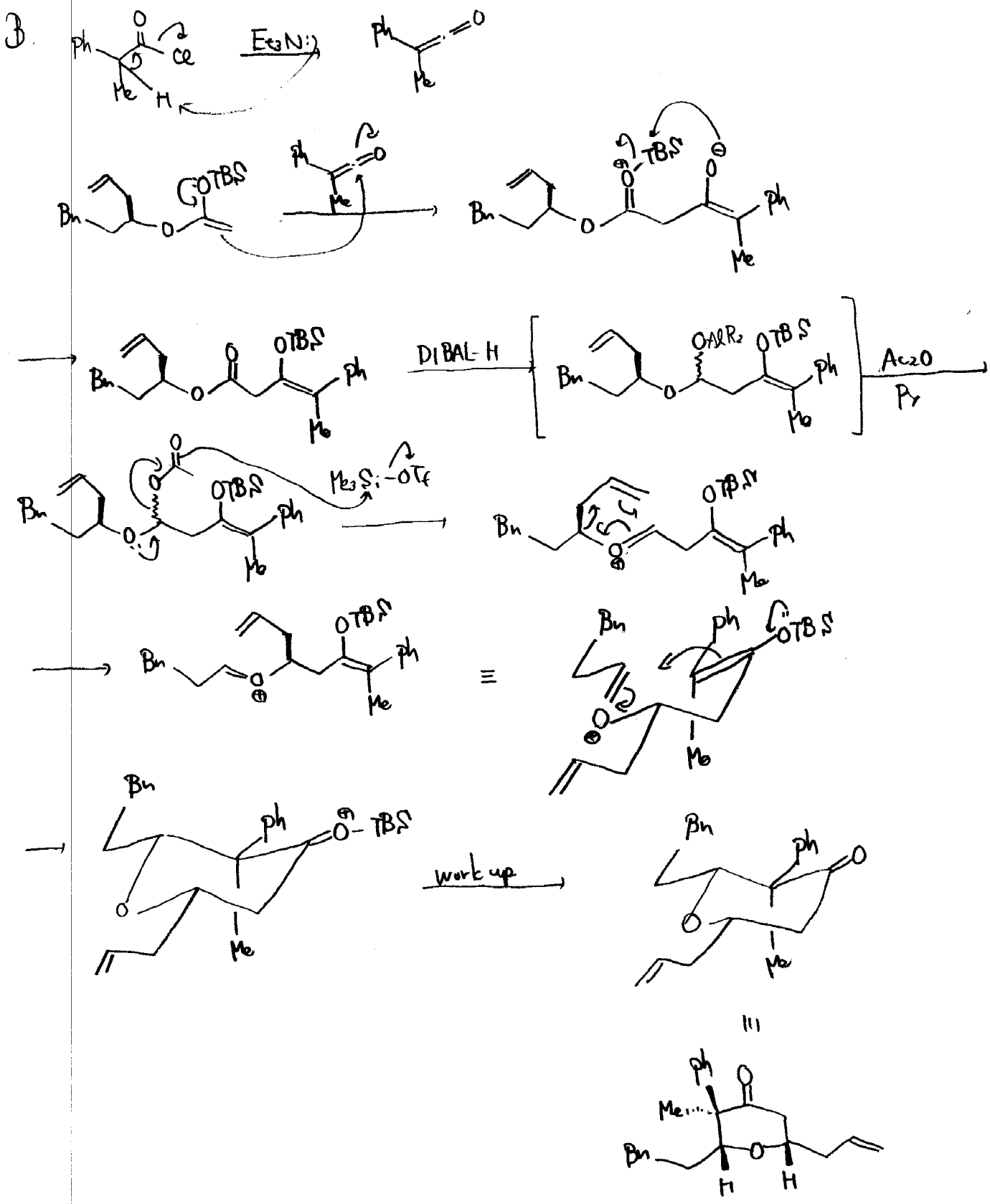
1


mCPBA
[Au]
5-exo
[Au]

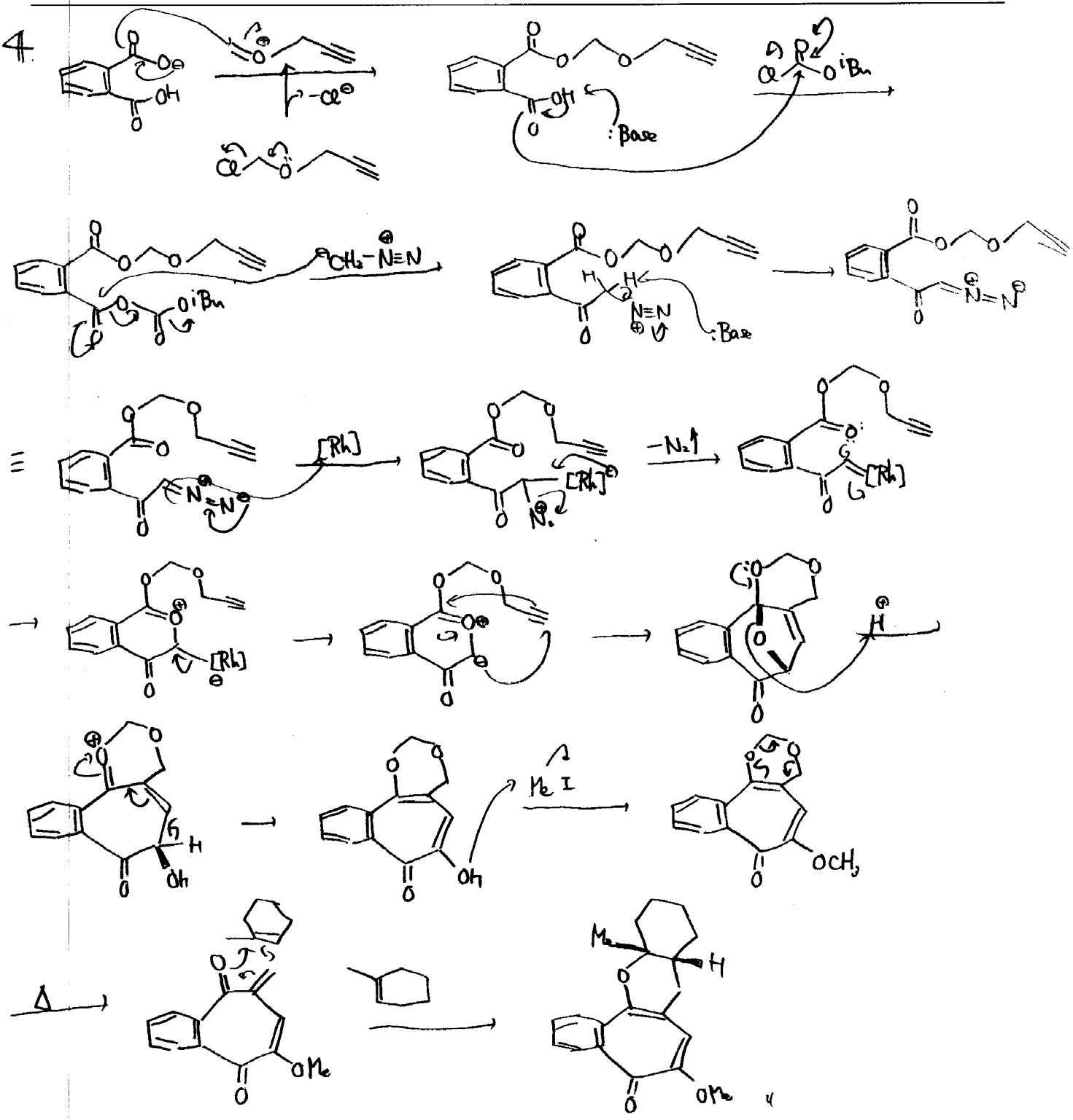
2.


Boc
mBu-Li
Li
CO2Me
SnCl2
H2
Pd(OH)2
HCl
MeOH-H2O

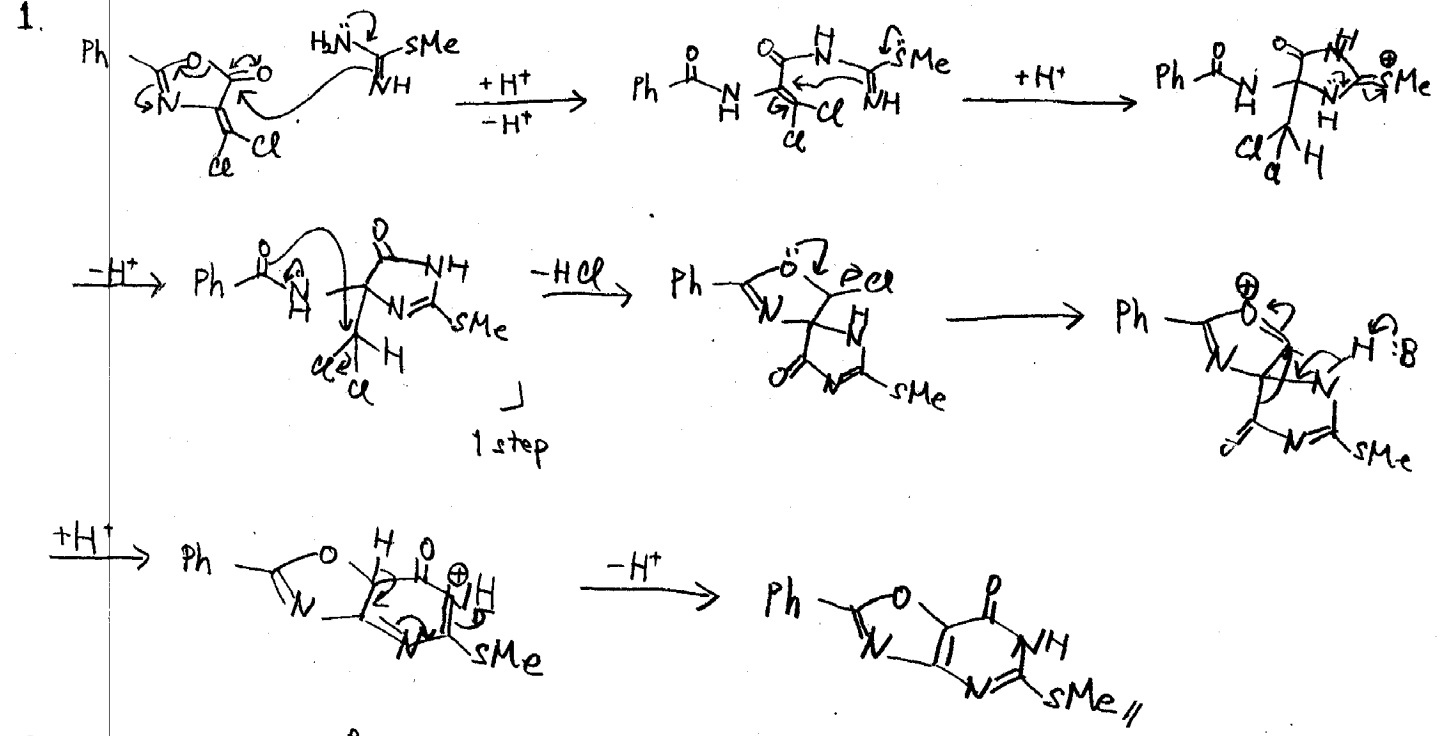
3.



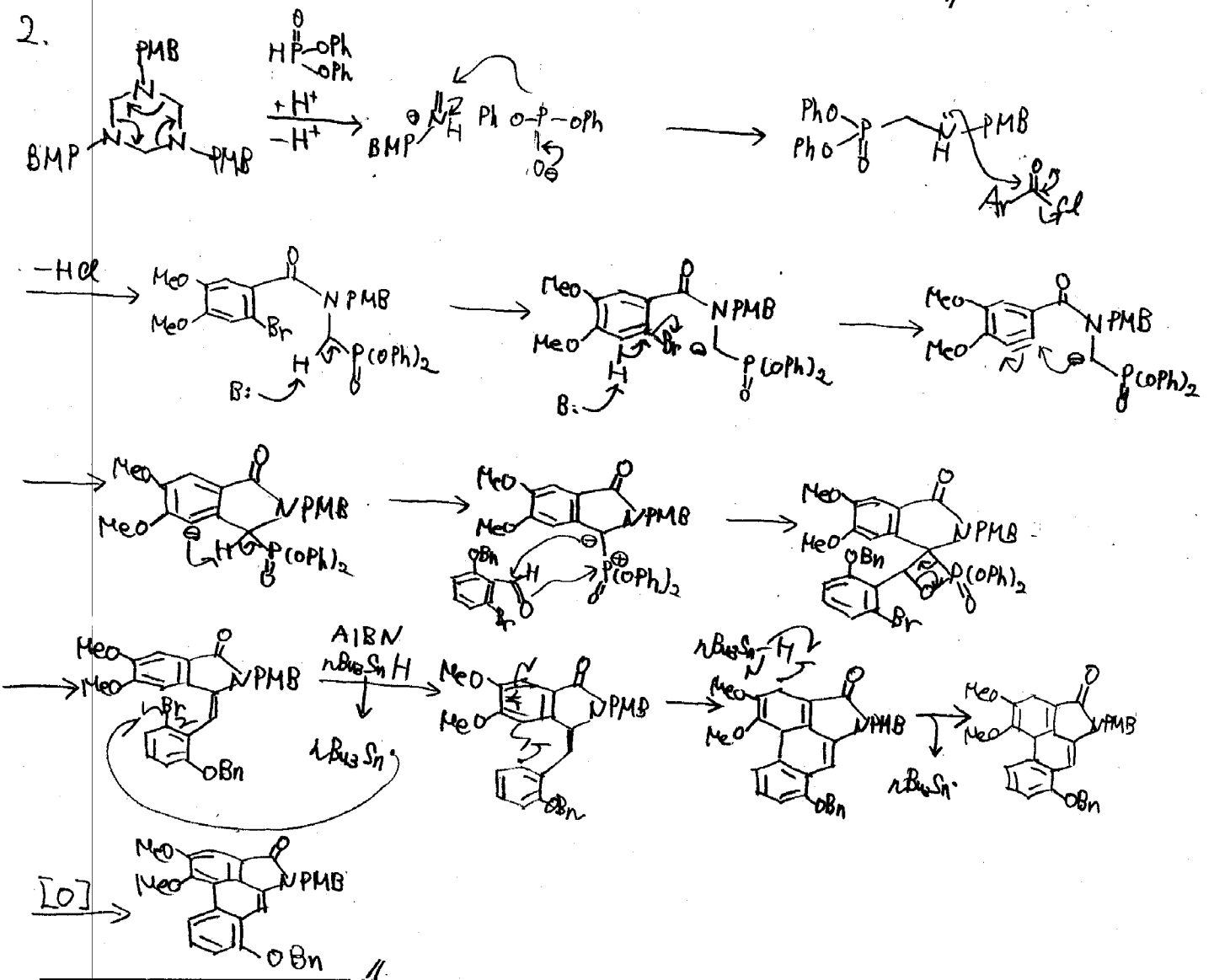
4.



1.



2.



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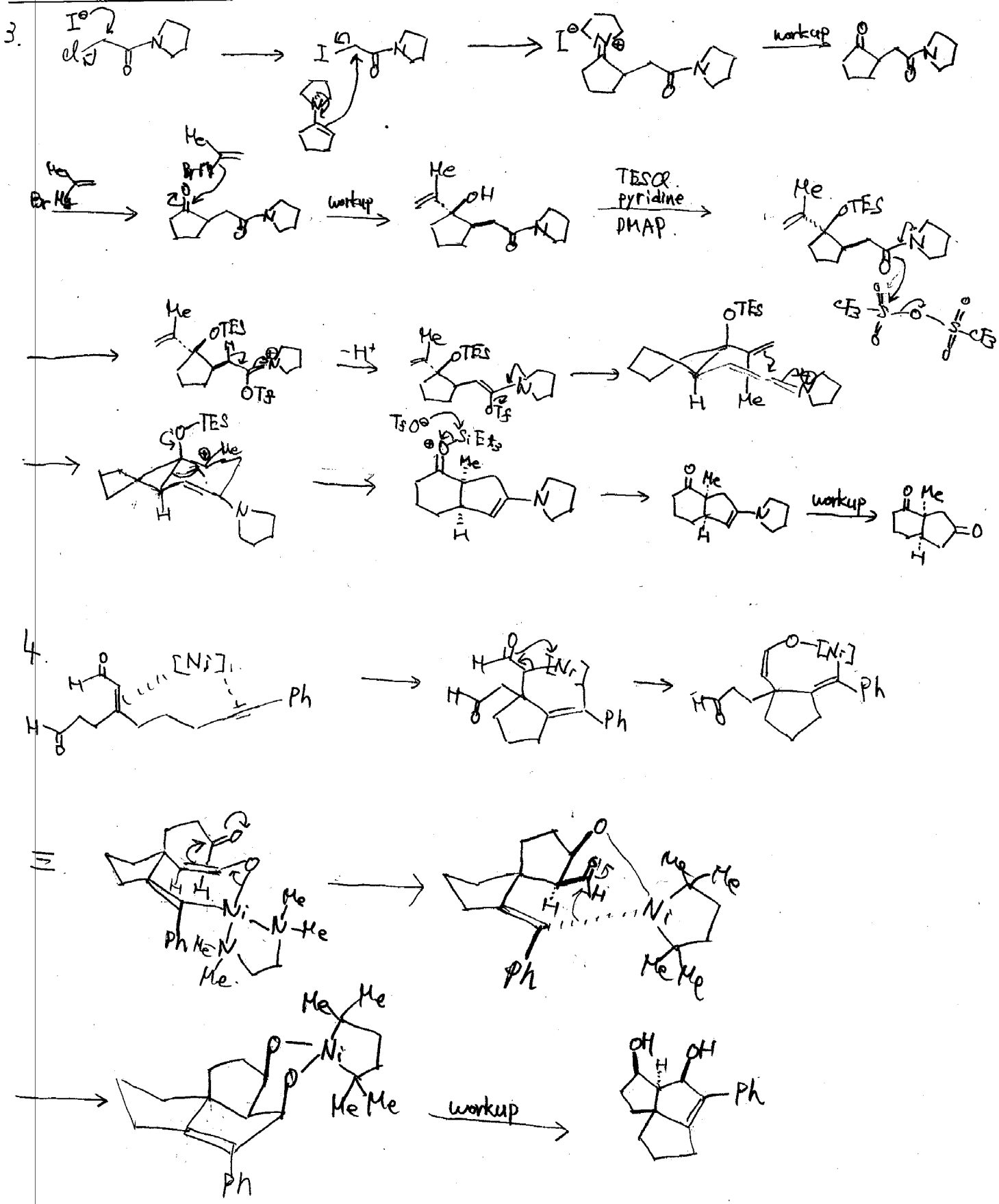
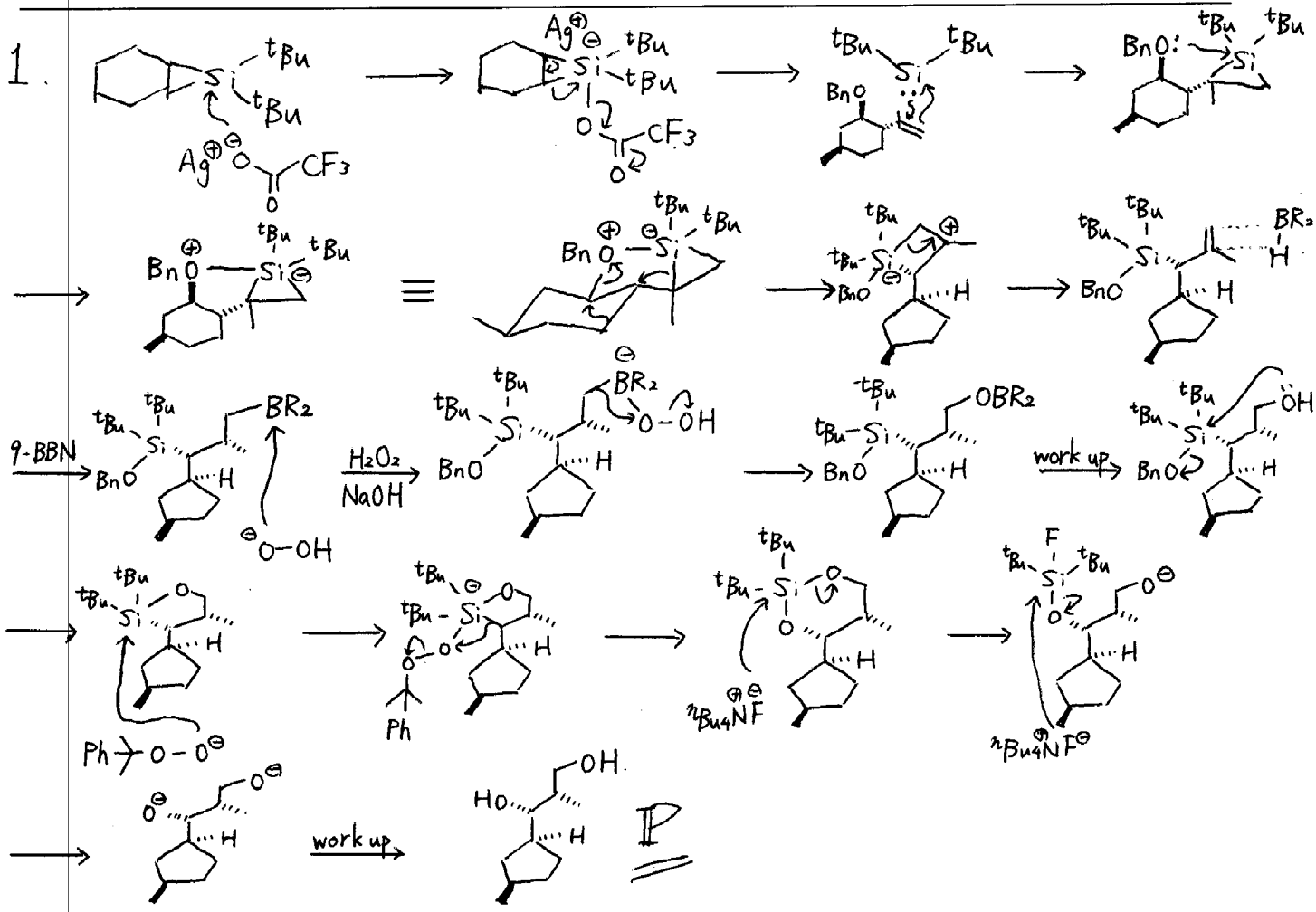

workup
TESCl
pyridine
DMAP
OTES
OTf
-H+
workup
workup

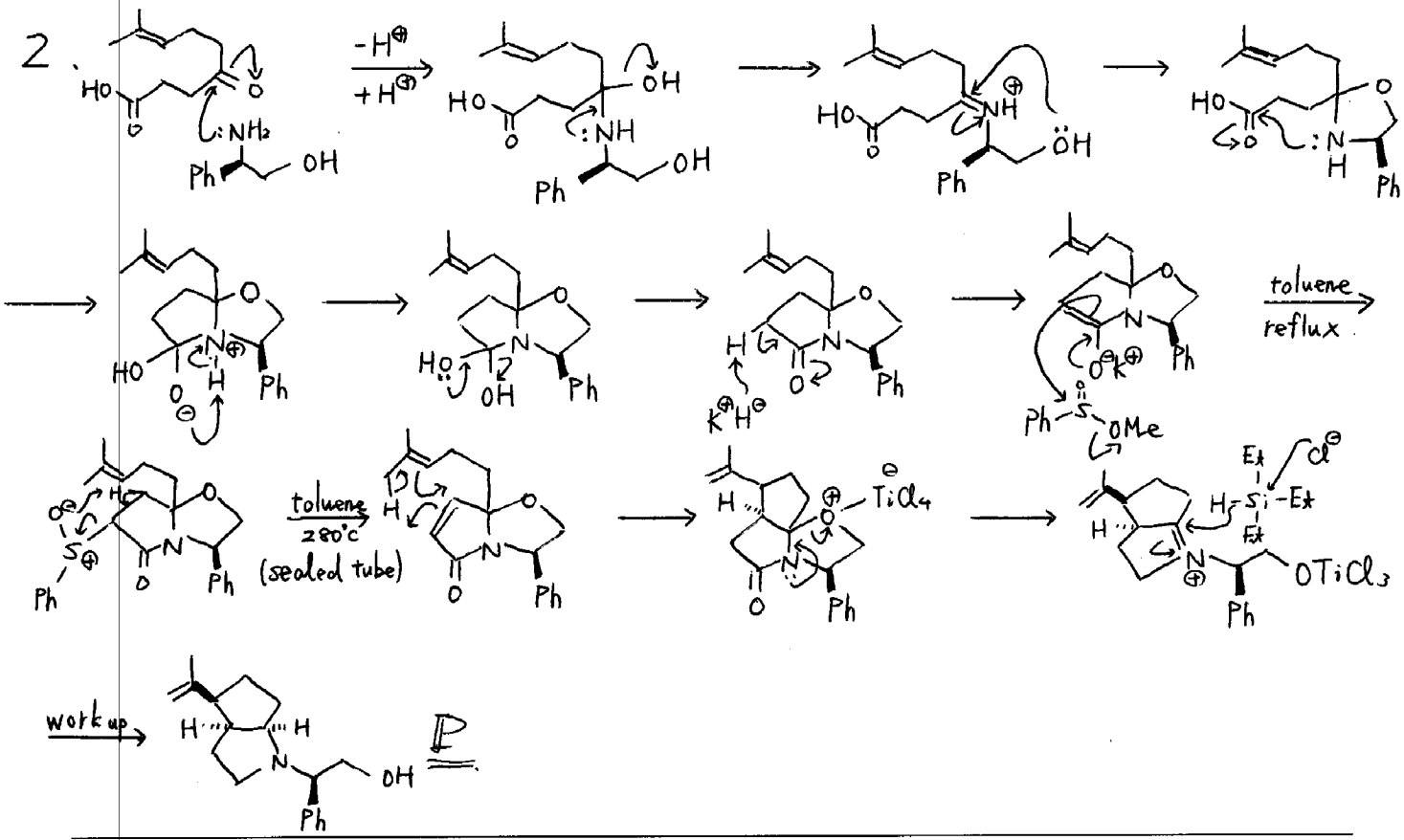
4.

[Ni]
Ph
workup

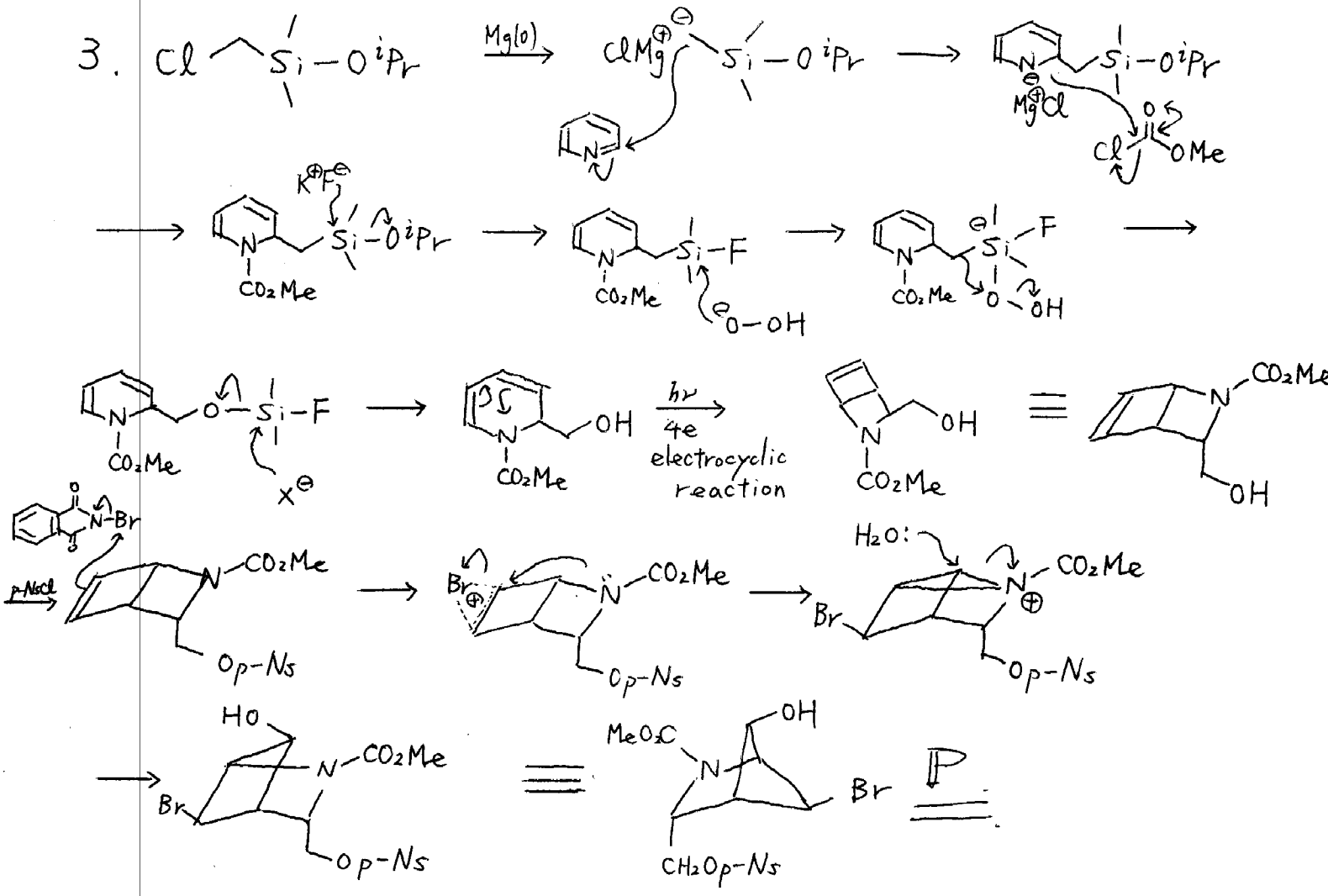
1.


9-BBN
H_2O_2
NaOH
work up
work up
$^nBu_4NF$
$^nBu_4NF$

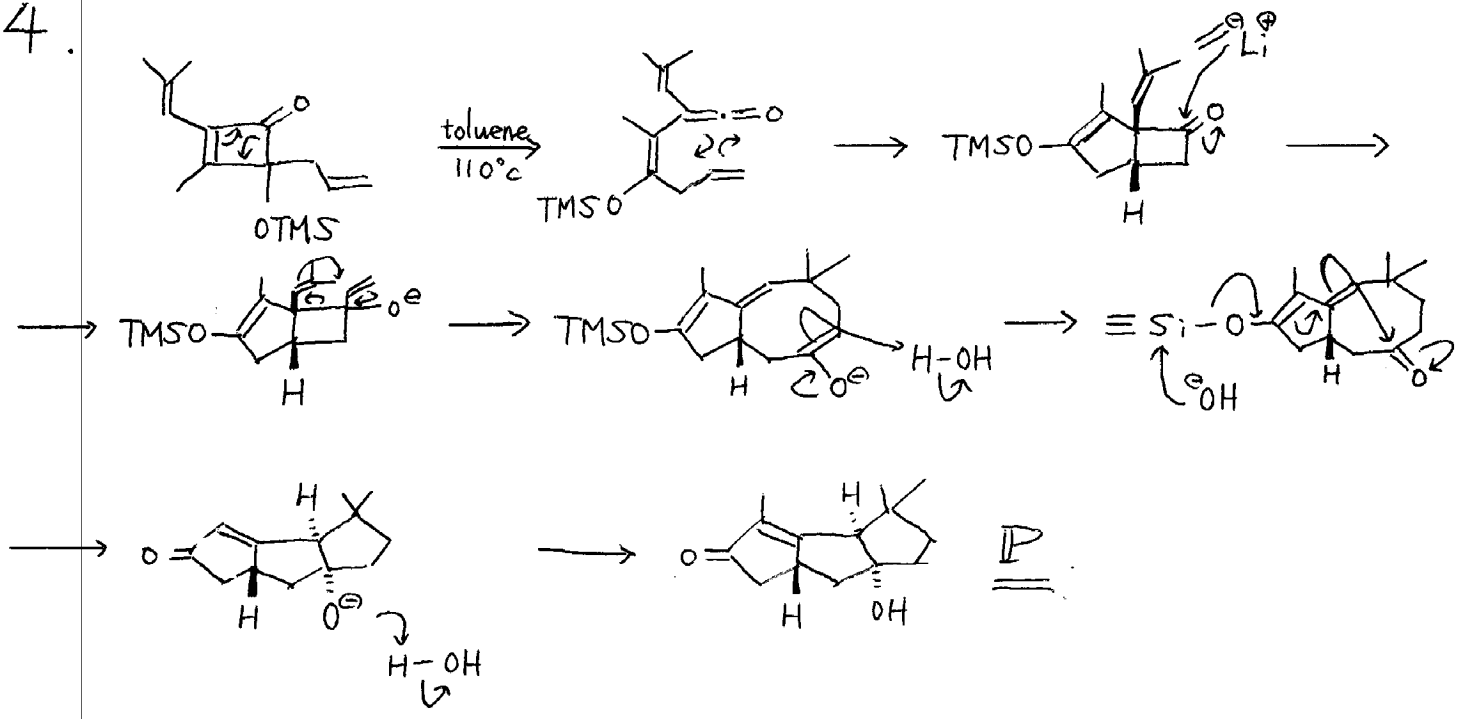
2.


$-H^\oplus$
$+H^\oplus$
toluene
reflux
toluene
280°C
(sealed tube)
work up

3.


Mg(0)
CO2Me
hν
4e
electrocyclic
reaction
p-NsCl
H2O:
Op-Ns
CH2Op-Ns
P

4.


OTMS
toluene
110°c
TMSO
P