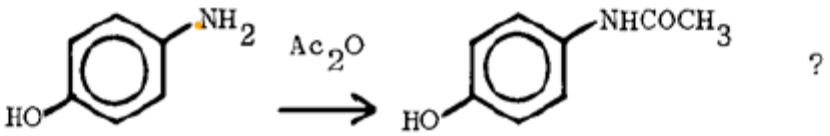
# Chemoselectivity

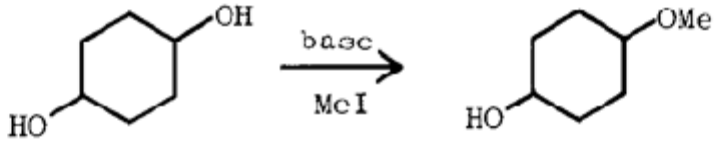
If in a molecule one functional group reacts leaving other potentially reactive functional group(s), the reaction is said to be chemoselective and displays chemoselectivity.

1. relative reactivity of two different functional groups; e.g.,



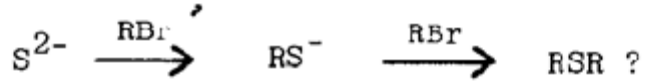

?

2. reaction of one of two identical functional groups; e.g.,




?

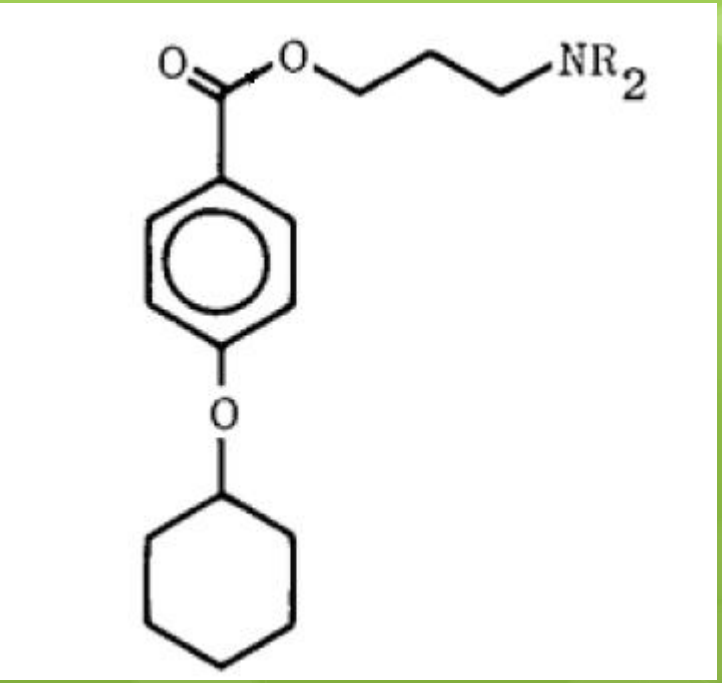
3. reaction of a group once when it may react again, e.g. thiol synthesis.



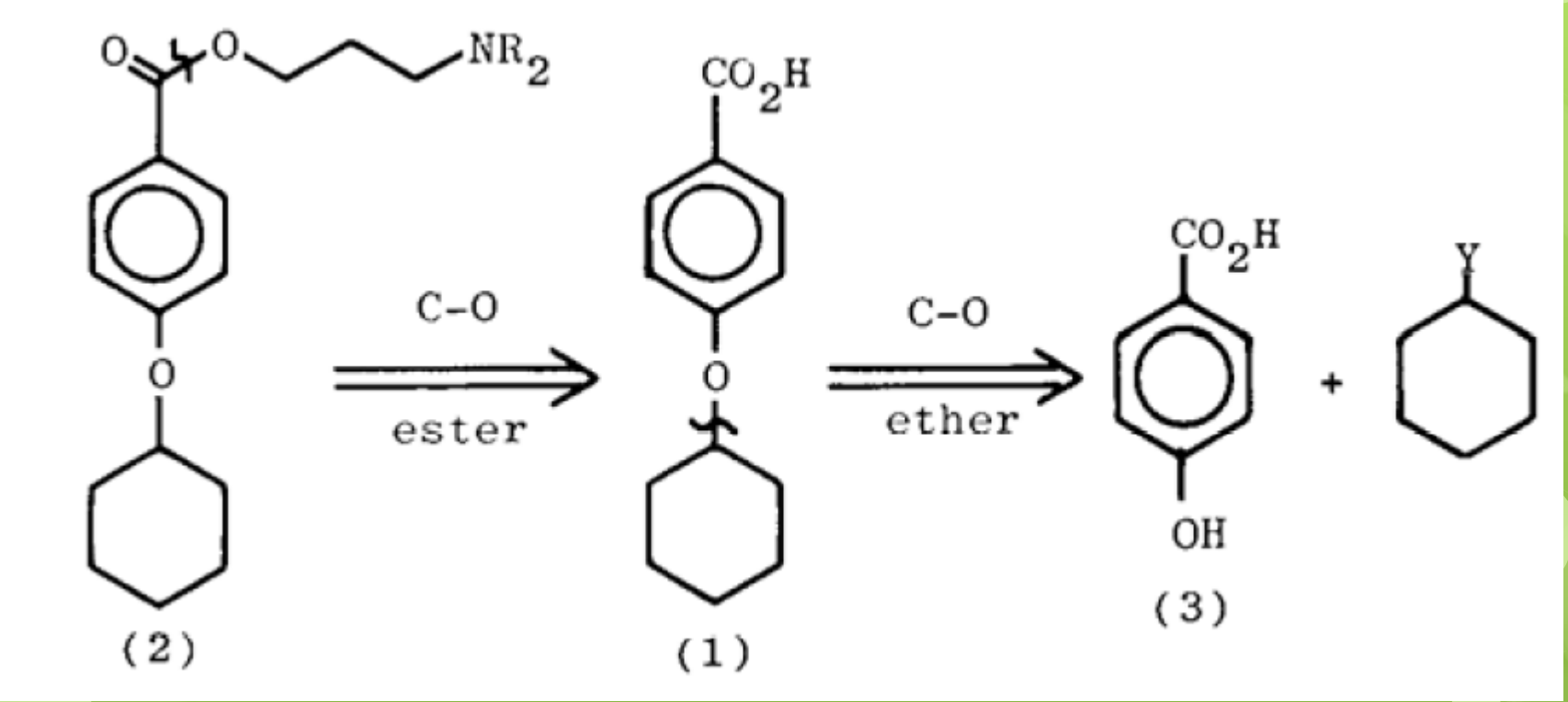

wanted

# Guideline 1

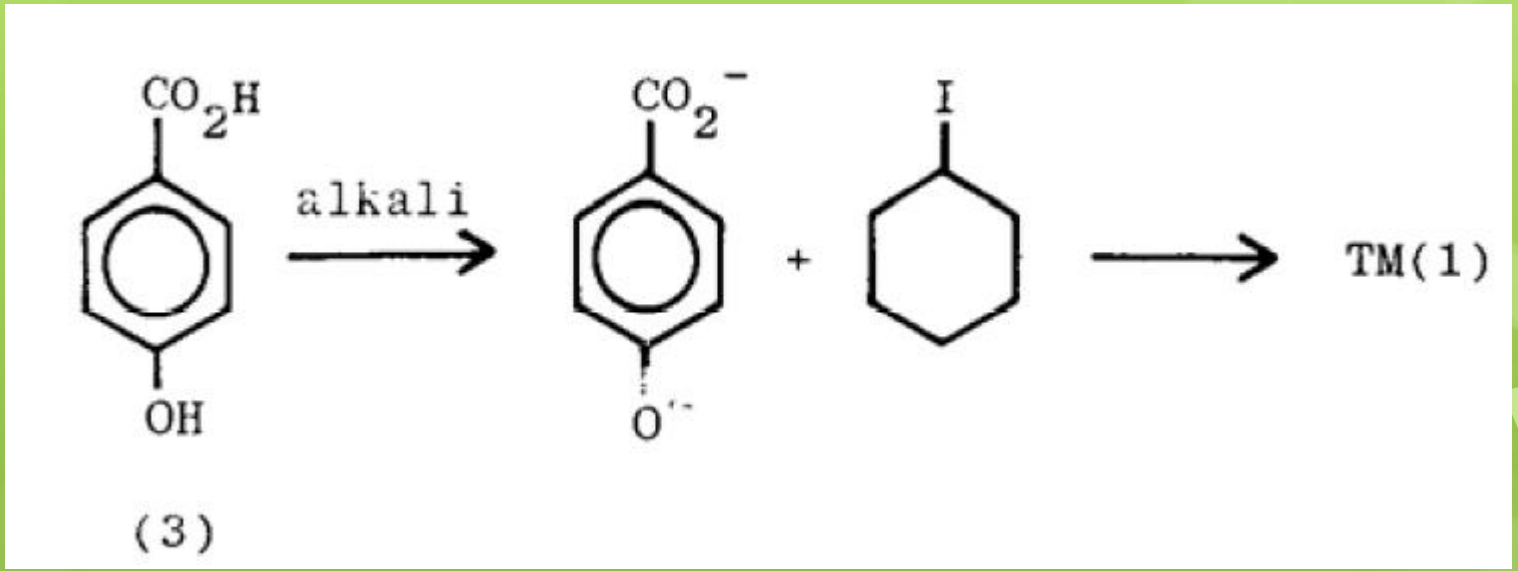
*With two functional groups of unequal reactivity, the more reactive can always be made to react alone.*



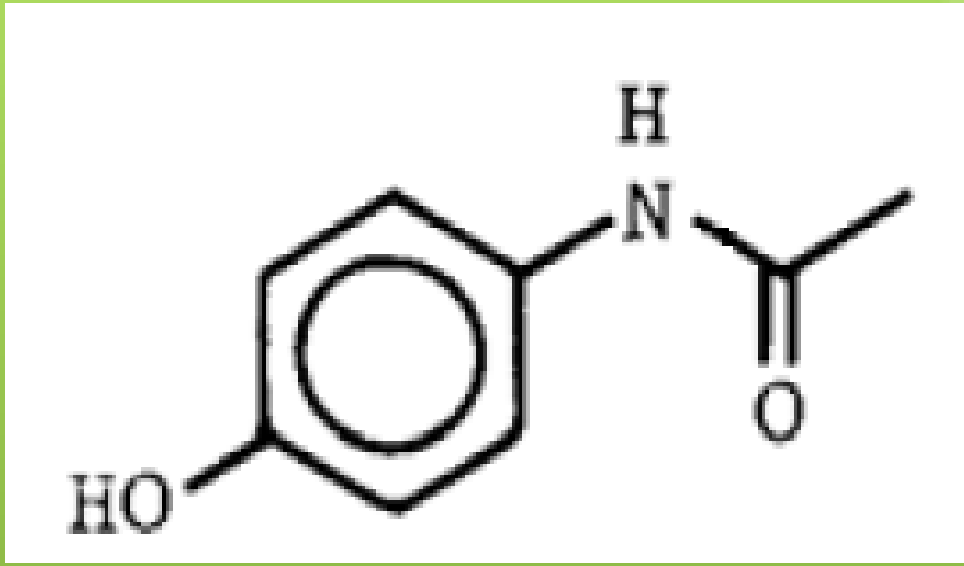
# Guideline 1: cyclomethycaine



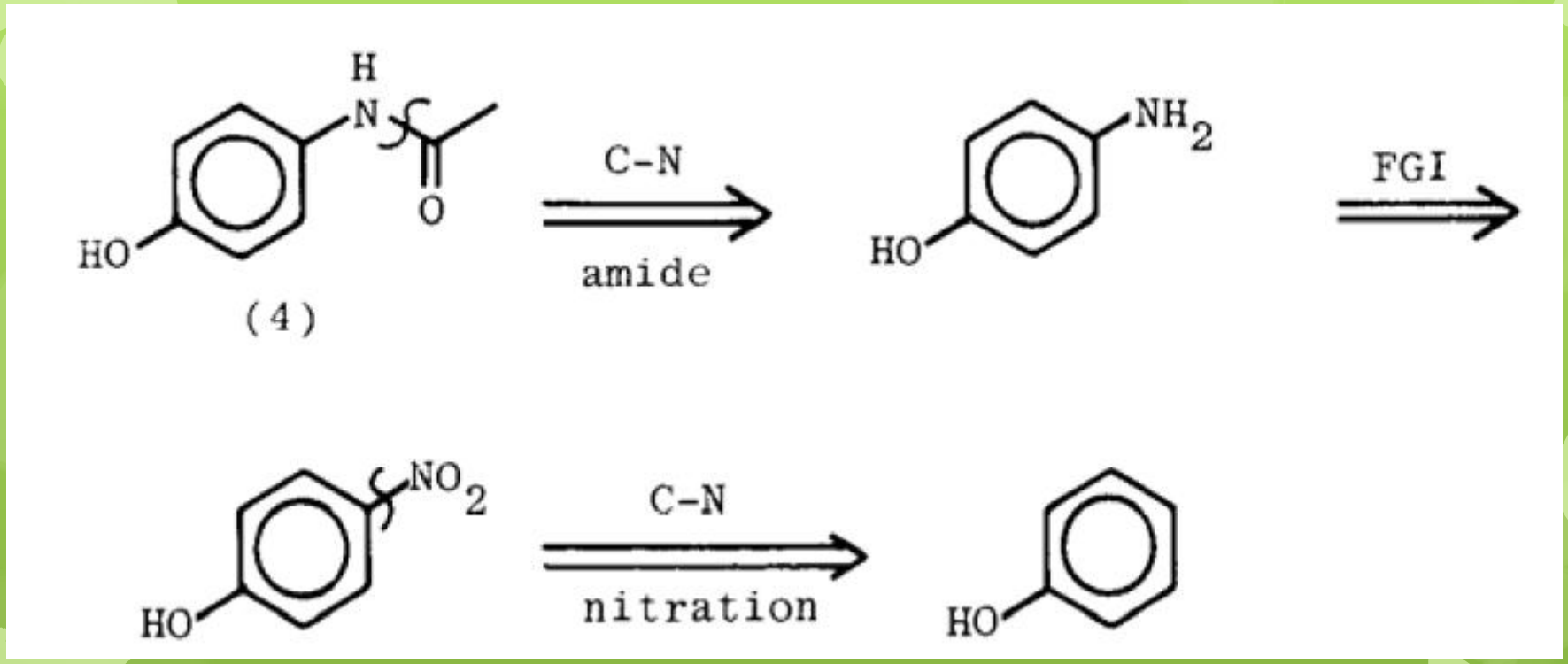
# Guideline 1



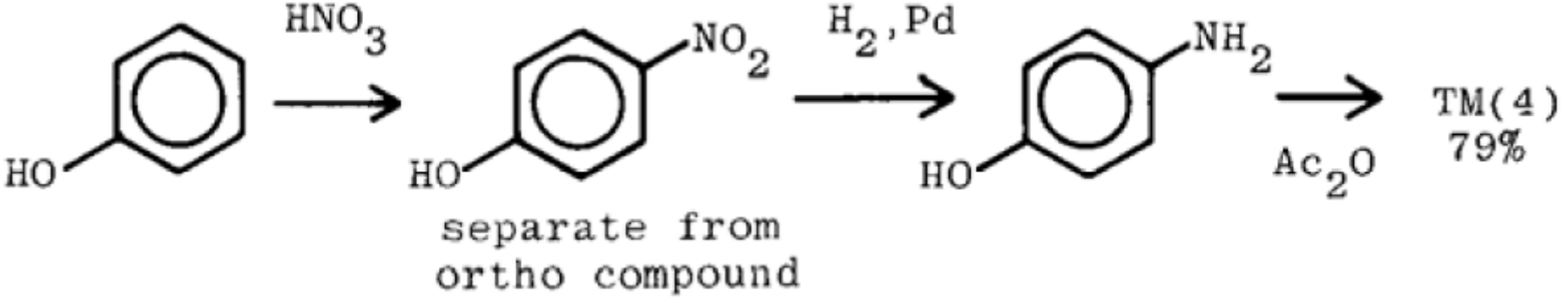
# Guideline 1: Paracetamol



# Guideline 1: Paracetamol

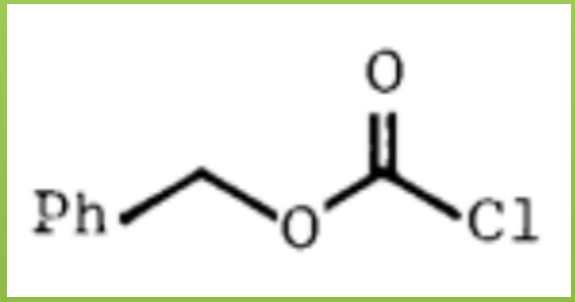


# Guideline 1: Paracetamol

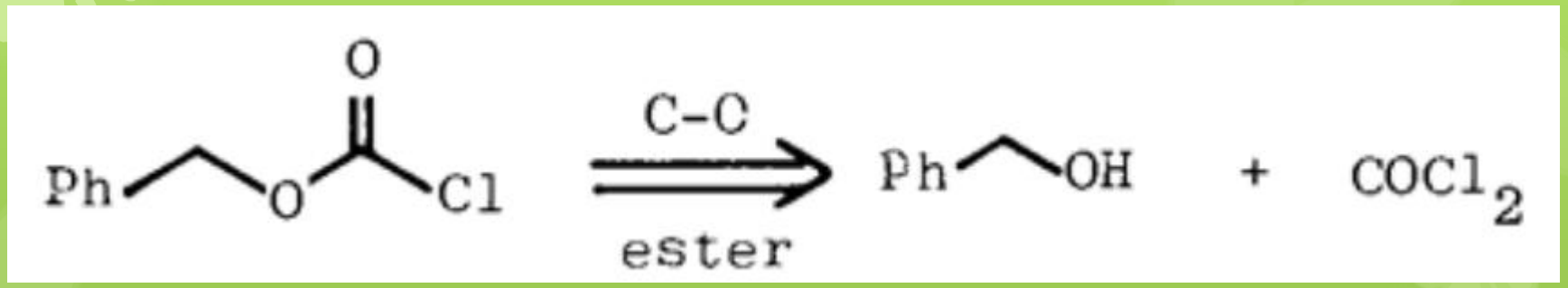


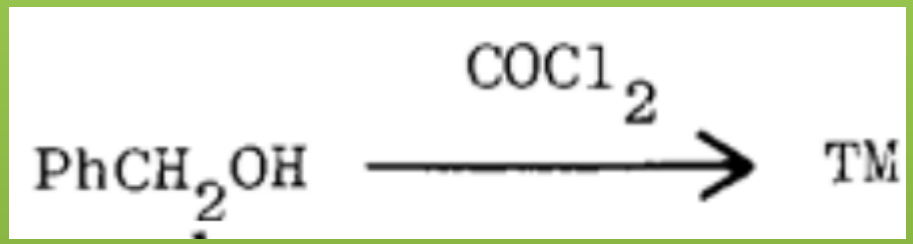
# Guideline 2

When one functional group can react twice, the starting material and the first product will compete for the reagent. The reaction will be successful only if the first product is less reactive than the starting material.



# Guideline 2

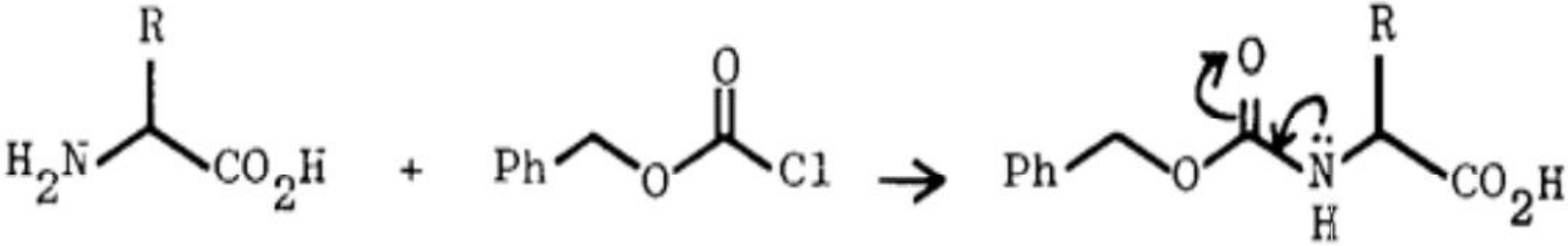


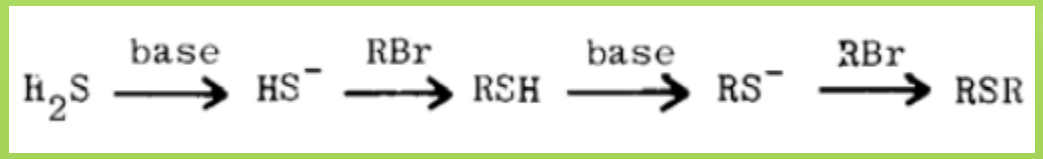
# Guideline 3

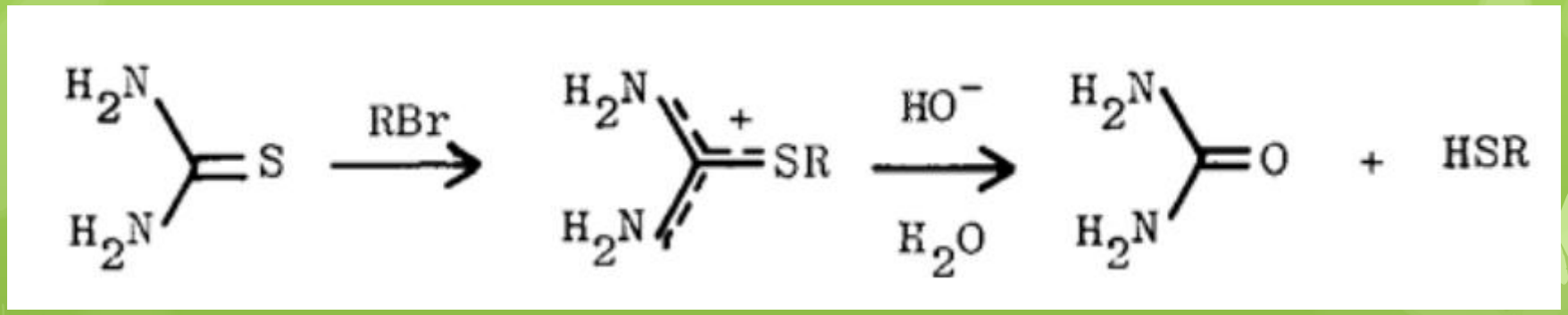
Unfavorable cases from guidelines 1 and 2 may be solved by the use of protecting groups.

If we want to react the less reactive of two different functional groups or if the product of a reaction with one FG is as reactive or more reactive than the starting material

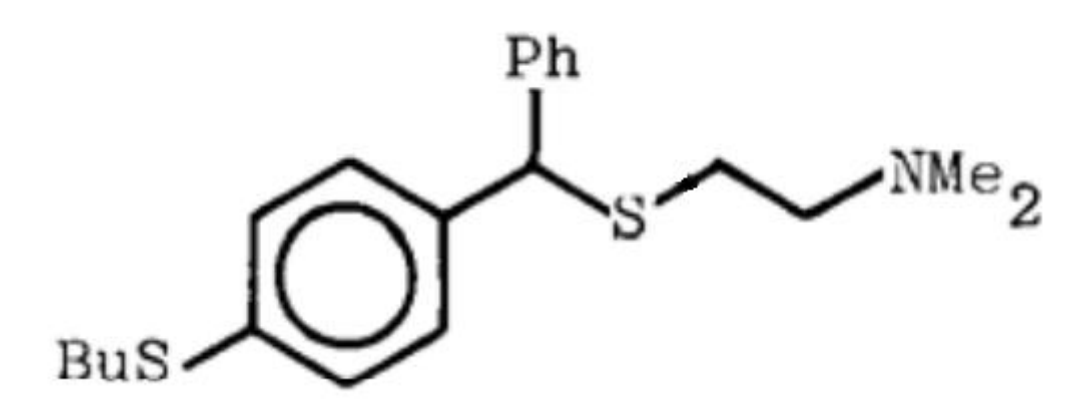


# Guideline 3

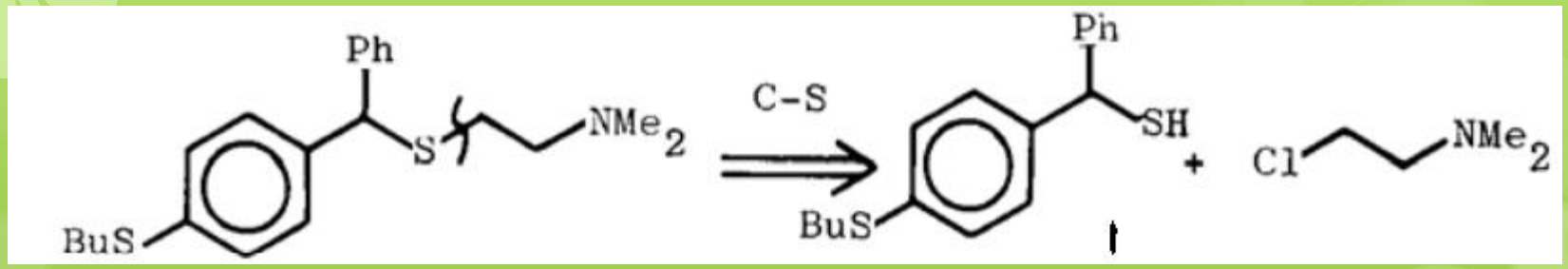

base
RBr
base
RBr
$H_2S$
$HS^-$
RSH
$RS^-$
RSR

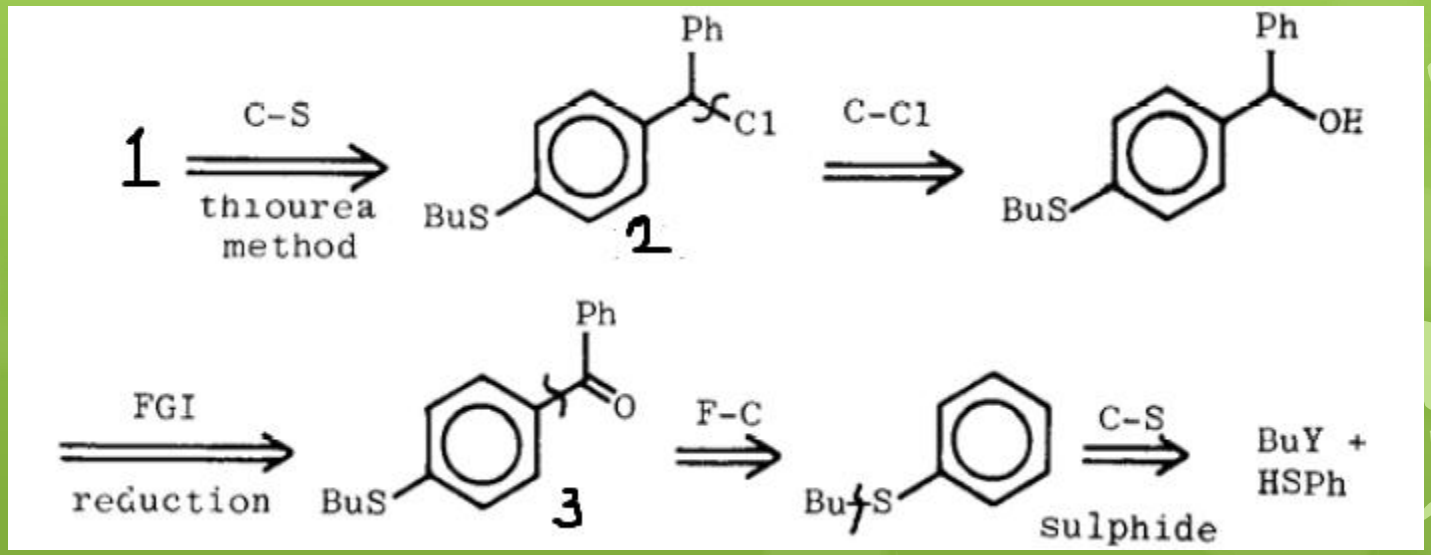

$H_2N$
$H_2N$
S
RBr
$H_2N$
$H_2N$
+
SR
$HO^-$
$H_2O$
$H_2N$
$H_2N$
O
+
HSR

# Guideline 3

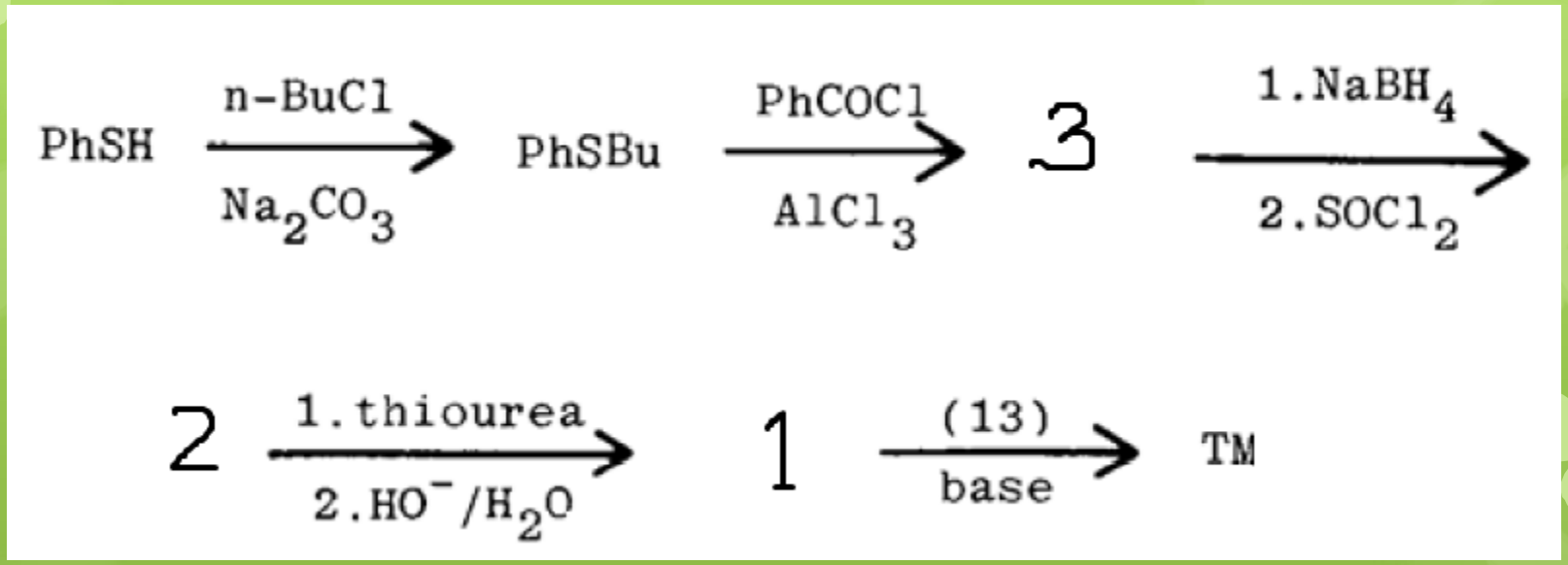


# Guideline 3


Ph
S
NMe2
BuS
C-S
Ph
SH
BuS
1
+
Cl
NMe2

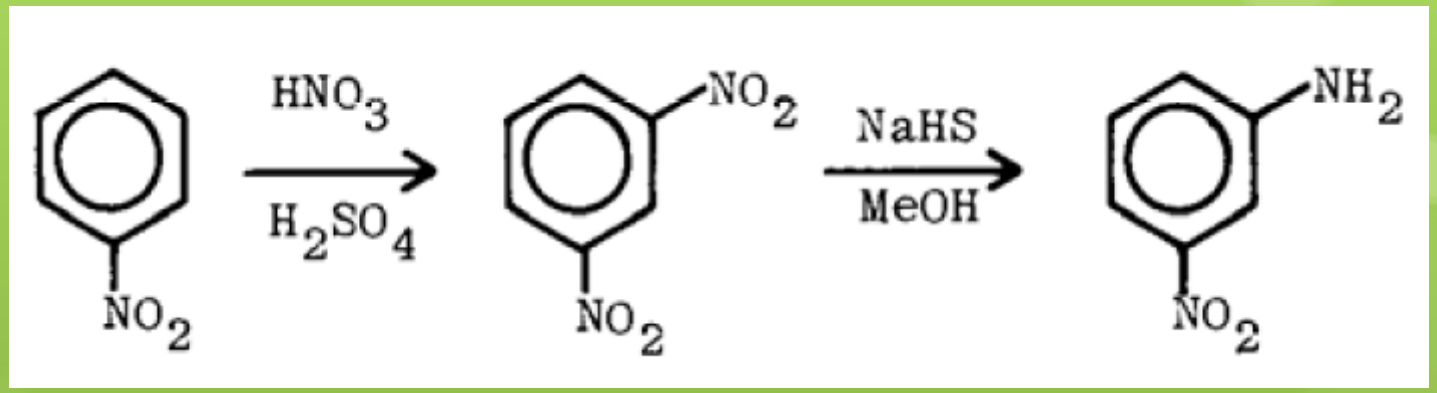

1
C-S
thiourea
method
Ph
Cl
BuS
2
C-Cl
Ph
OH
BuS
FGI
reduction
Ph
O
BuS
3
F-C
BuS
C-S
sulphide
BuY +
HSPh

# Guideline 3

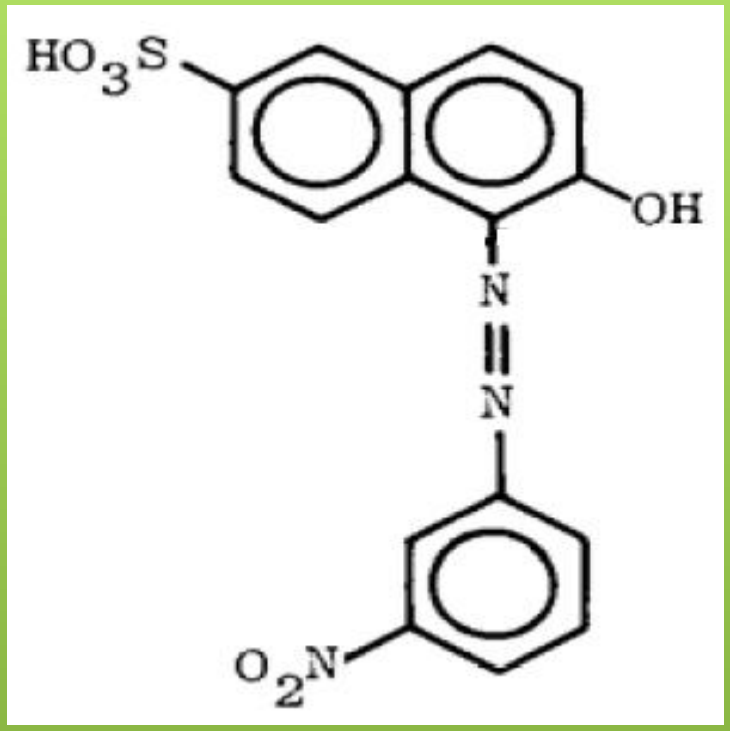

PhSH
n-BuCl
$Na_2CO_3$
PhSBu
PhCOCl
$AlCl_3$
3
1.$NaBH_4$
2.$SOCl_2$
2
1.thiourea
2.$HO^-/H_2O$
1
(13)
base
TM

# Guideline 4

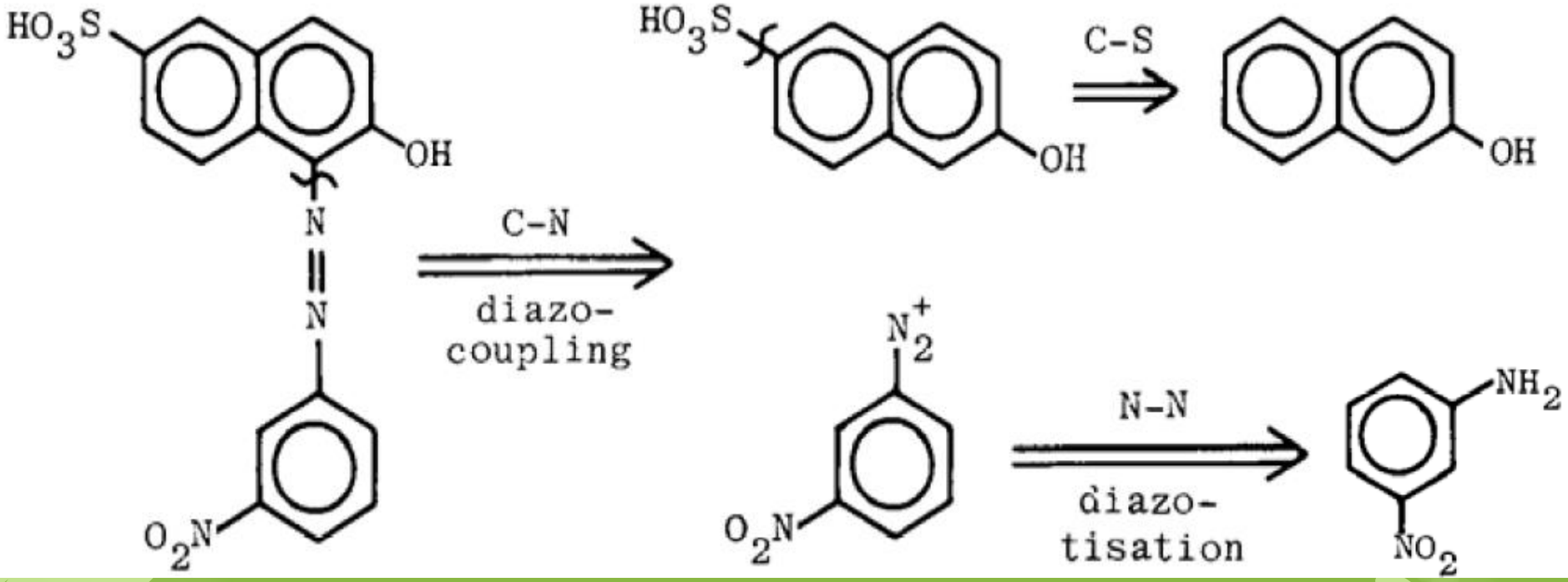
One of the two identical groups may react if the product is less reactive than the starting material.



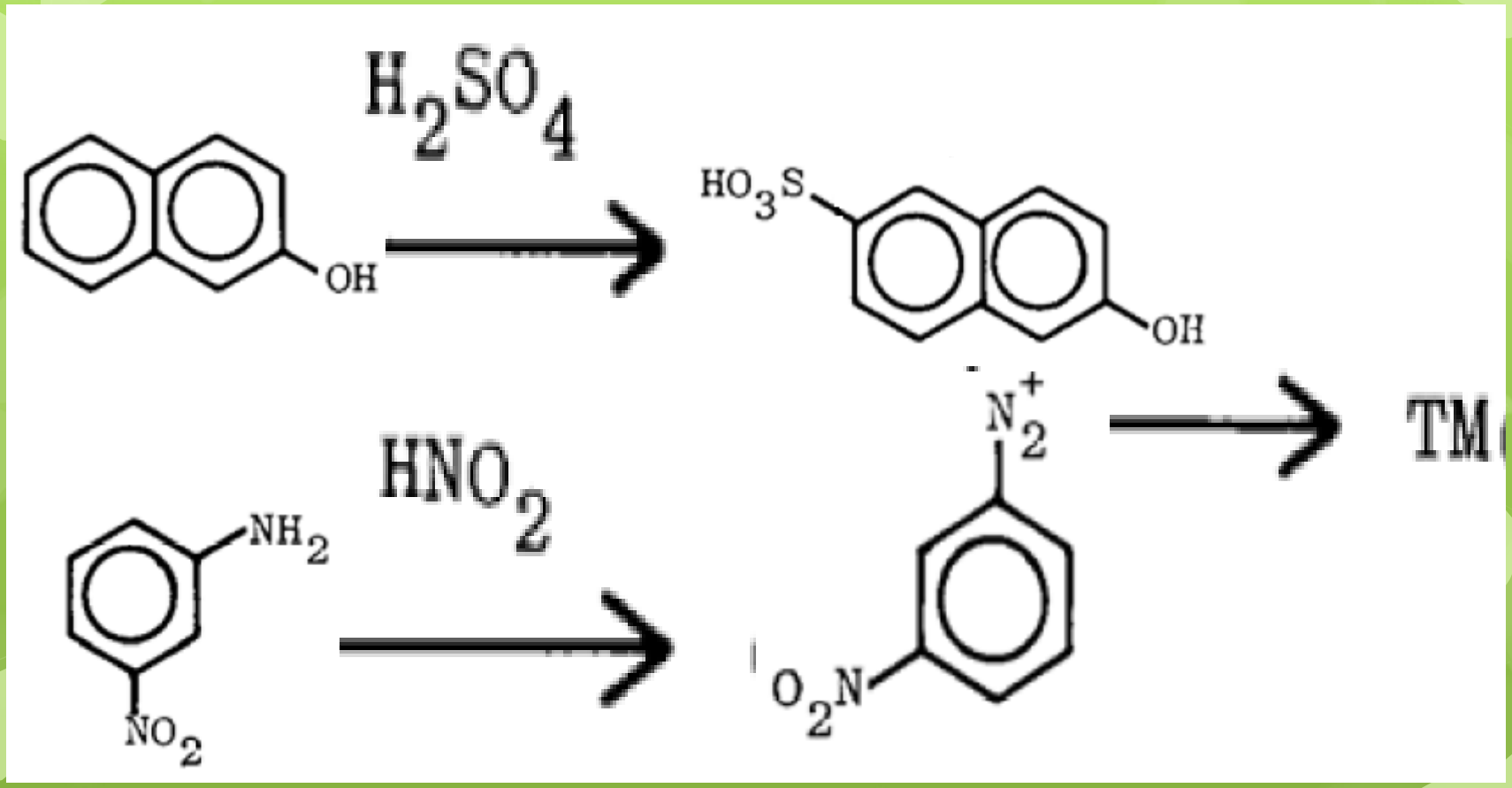
# Guideline 4



# Guideline 4

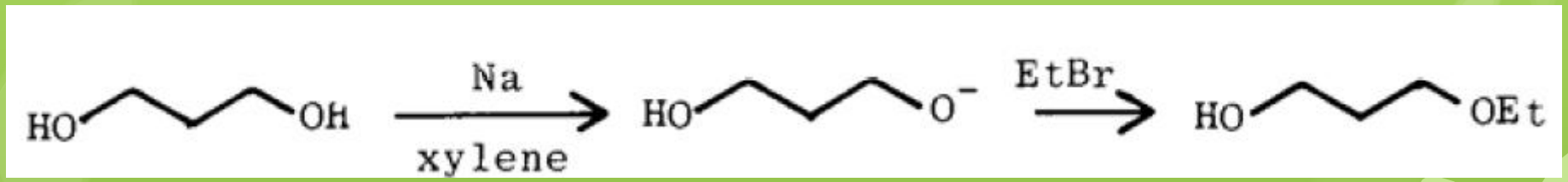

HO3S
OH
N
N
O2N
C-N
diazo-
coupling
HO3S
OH
C-S
OH
N2+
O2N
N-N
diazo-
tisation
NH2
NO2

# Guideline 4



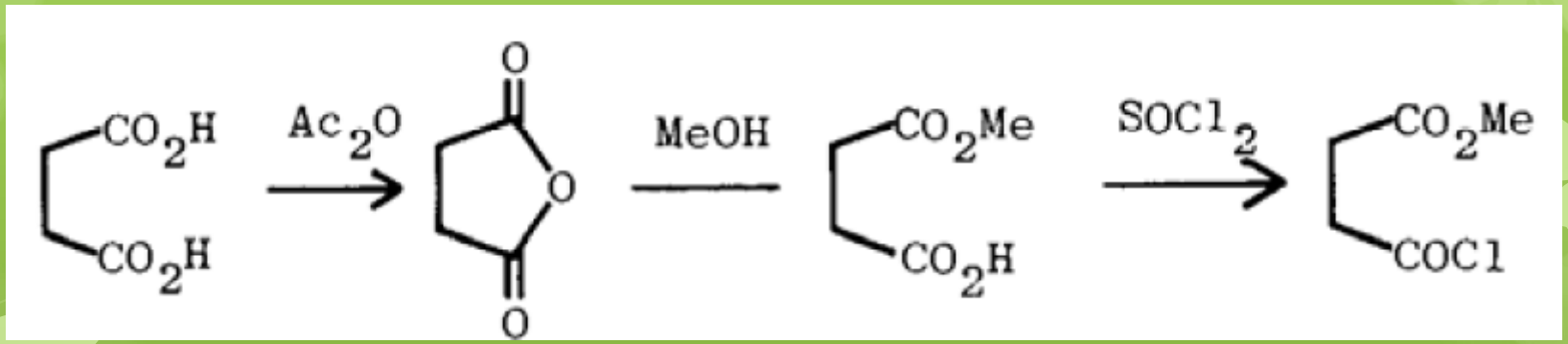
# Guideline 5

One of the two identical functional groups may react with one equivalent of reagent using the statistical effect.



# Guideline 6

A more reliable method with two identical functional groups is to use a derivative which can react once only.



# Guideline 7

When two groups are nearly but not quite identical, avoid attempts to make only one of them react.

