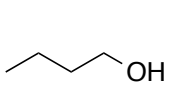
Oxidation States, Hydrogenation, And Hydrogenolysis

from chapter(s) _____ in the recommended text

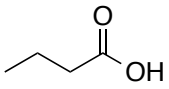
A. Introduction

B. Oxidation States In Organic Chemistry

addition
loss
addition
loss
more *less* *C-O*,
less *C-H* bonds
more *C-O*,



a



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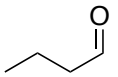
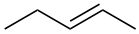
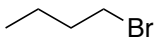


c

d



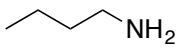
e



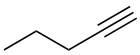
f

CO_2

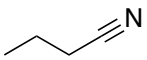
g



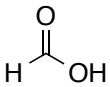
h



i



j



k

CH_2Cl_2

l

CCl_4

m

$HCCl_3$

n

HCOH

o

lowest oxidation state **d**

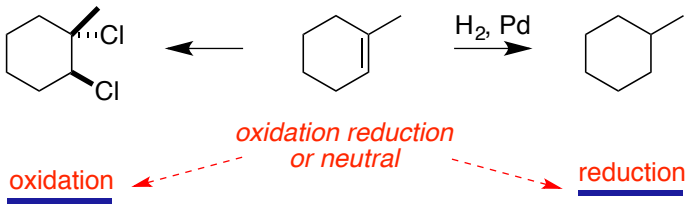
one level higher **a, e, f, h**

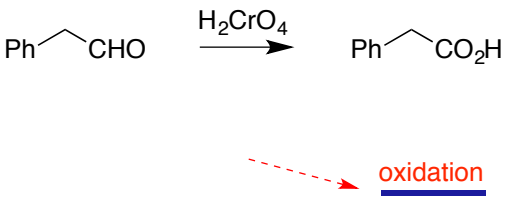
one more level higher **c, i, l, o**

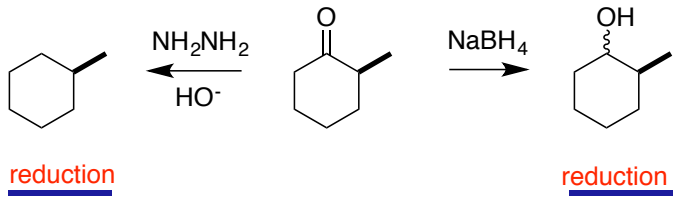
still another level higher **b, j, k, n**

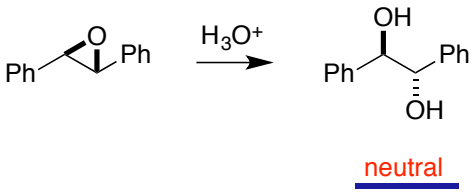
highest oxidation state **g, m**

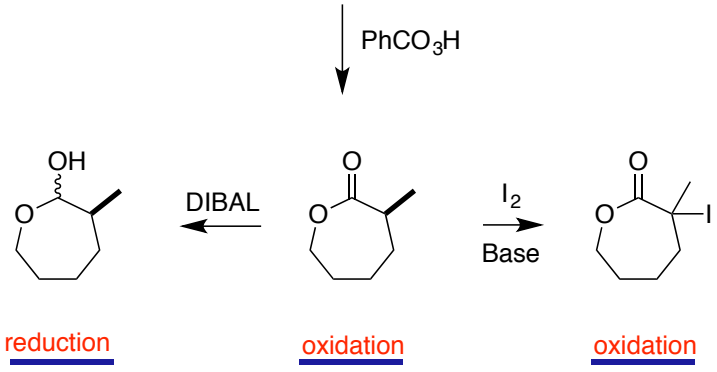
Cyclohexane is at a *higher*

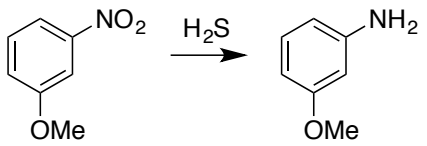








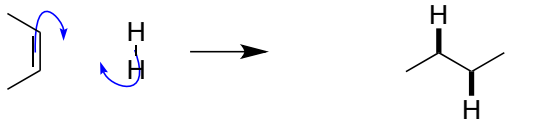


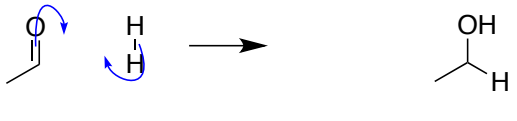


C. Addition Of H_2

Hydrogenation And Hydrogenolysis

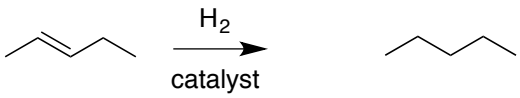
Hydrogenation reactions
hydrogenolysis involve
homolytic
radical mechanism, than a *ionic*

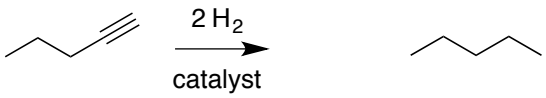


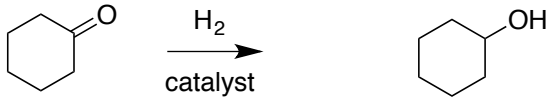


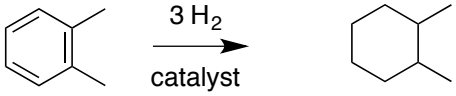
stabilize
benzyl
more
.

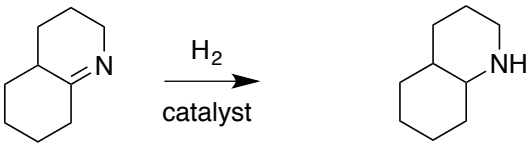
D. Hydrogenation

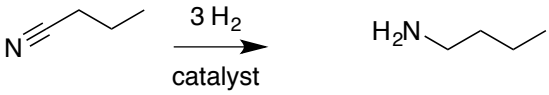


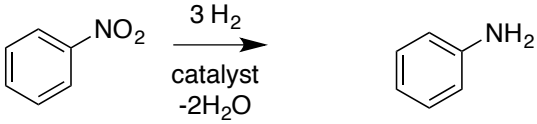


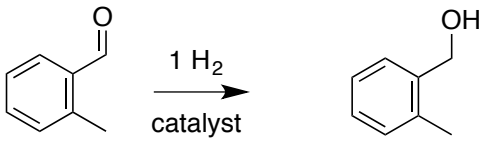


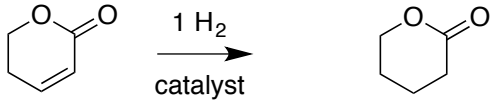

3 H2
catalyst

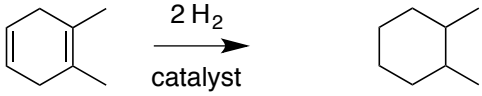

N
H2
catalyst
NH

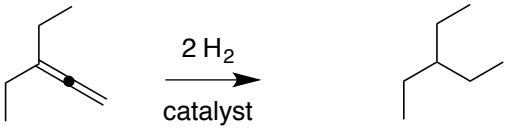

N
3 H2
catalyst
H2N

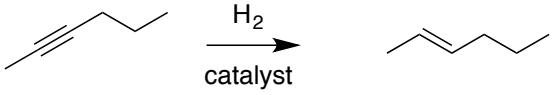

NO2
3 H2
catalyst
-2H2O
NH2

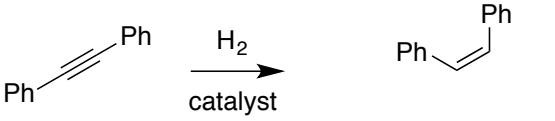

O
1 H2
catalyst
OH


O
O
1 H2
catalyst
O
O


2 H2
catalyst

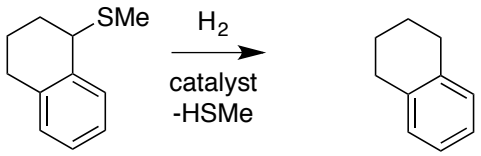

2 H2
catalyst

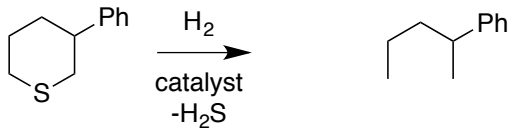

H2
catalyst

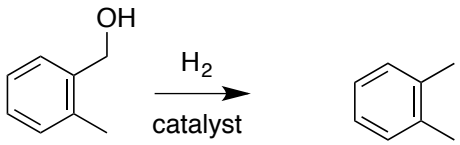

Ph
Ph
H2
catalyst
Ph
Ph

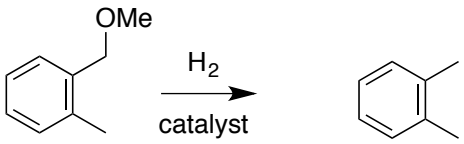
E. Hydrogenolysis

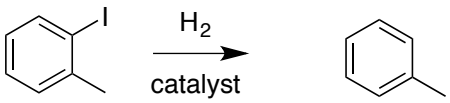
single

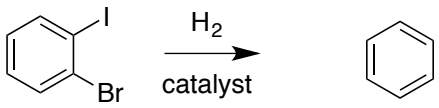


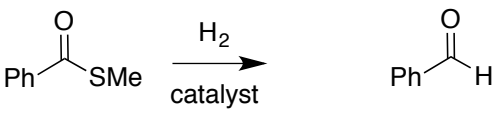


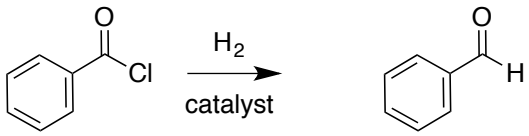


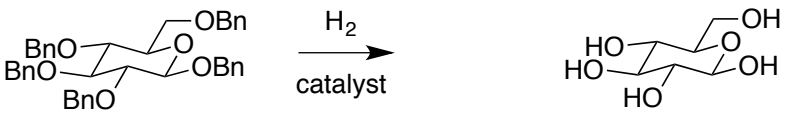


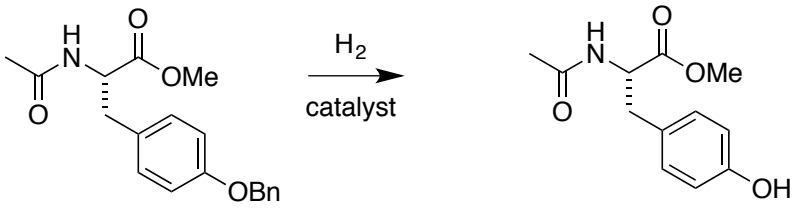


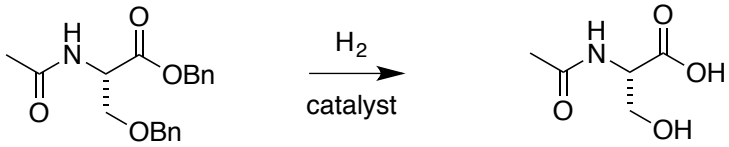


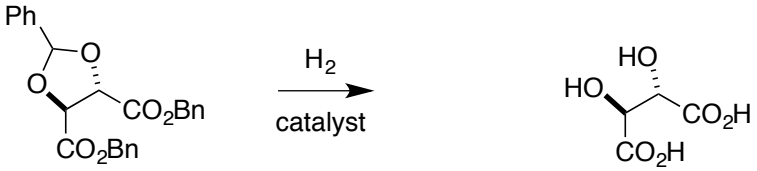


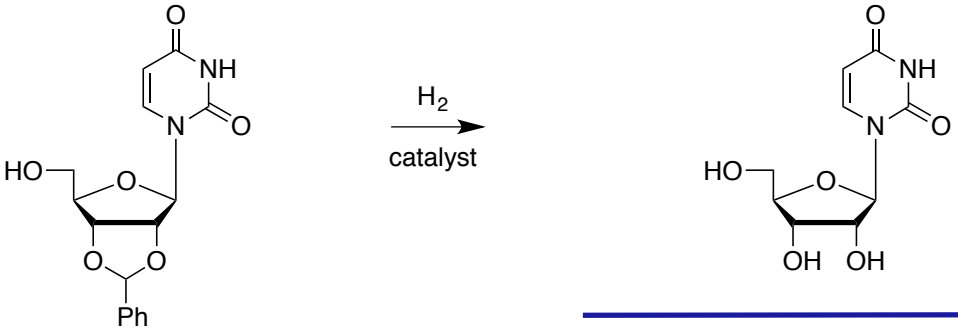



OBn
BnO
O
BnO
OBn
BnO
H2
catalyst
OH
HO
O
HO
OH
HO

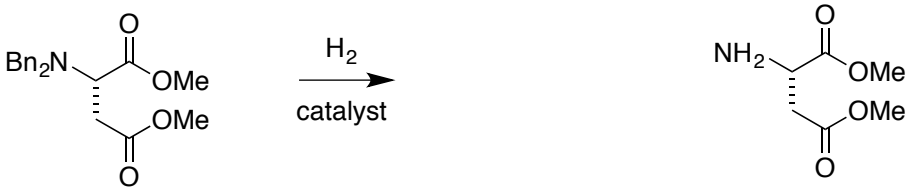

H
N
O
O
OMe
O
OBn
H2
catalyst
H
N
O
O
OMe
O
OH


H
N
O
O
OBn
O
OBn
H2
catalyst
H
N
O
O
OH
O
OH

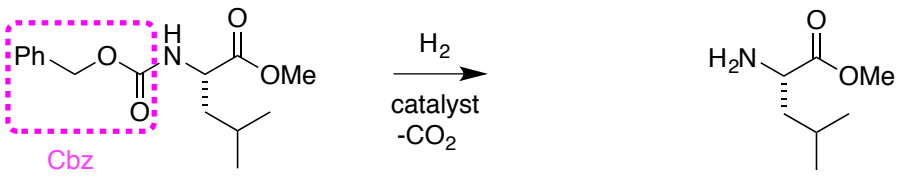

Ph
O
O
CO2Bn
CO2Bn
H2
catalyst
HO
HO
CO2H
CO2H



does not reduce the base



harder
Cbz.

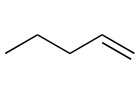


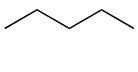
F. Double Bond Equivalents

1 and *2* molecules of H_2
4 molecules of H_2
can be calculated

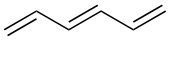
can
1 and *1*, respectively.

(*True*,
1 and *4*
True,

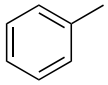

1


0


1


3


4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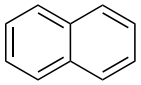
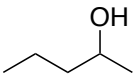

7


2



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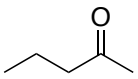
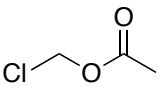
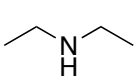


1



1



0

1

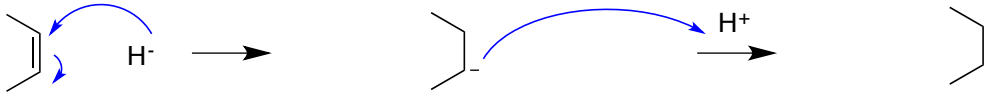
4

0

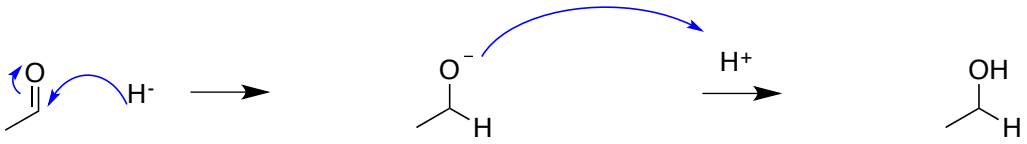
0

do not apply

G. Hydridic Reductions



hard



easy