

# Oxidation States, Hydrogenation, And Hydrogenolysis

---

from chapter(s) \_\_\_\_\_ in the recommended text

## A. Introduction

## B. Oxidation States In Organic Chemistry

addition

loss

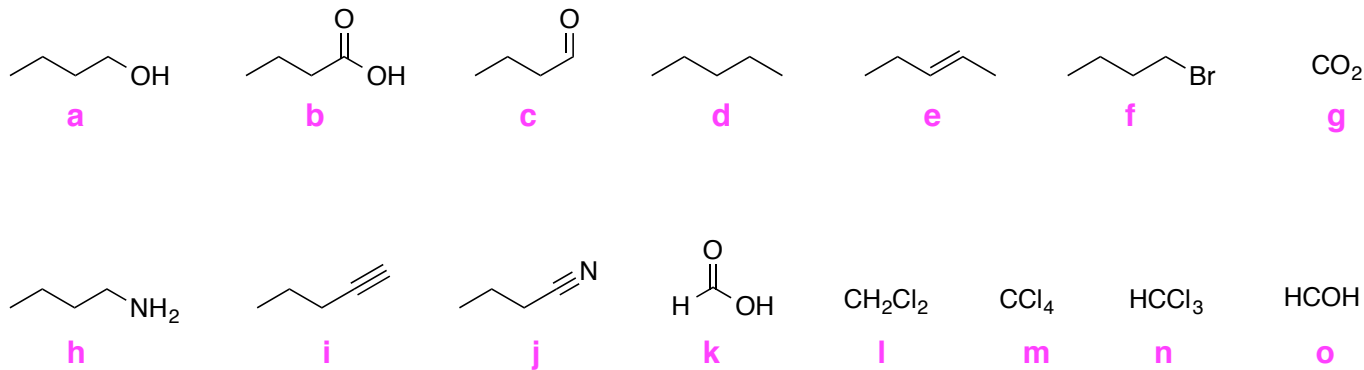
addition

loss

more less C-O,

less C-H bonds

more C-O,



*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**

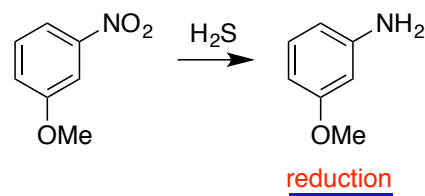
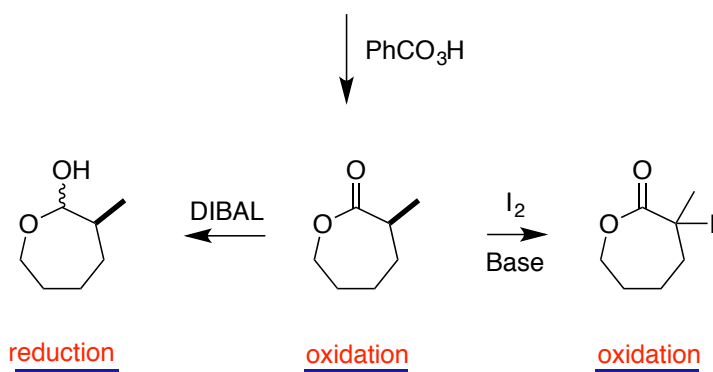
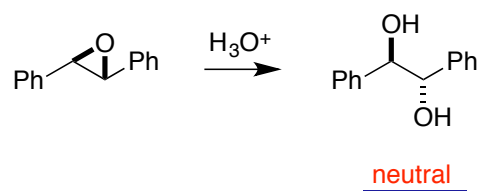
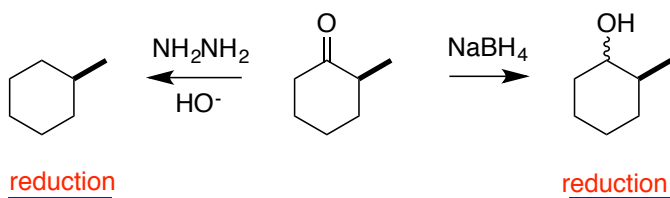
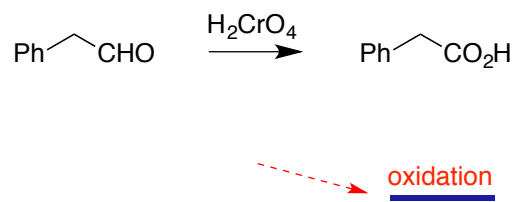
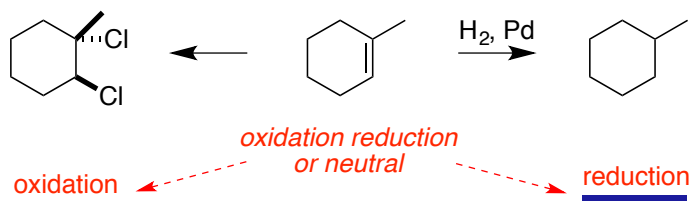
---

*highest oxidation state*

**g, m**

---

Cyclohexane is at a *higher*



## C. Addition Of H<sub>2</sub>

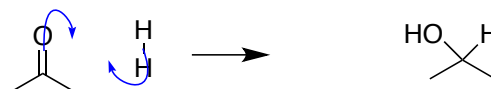
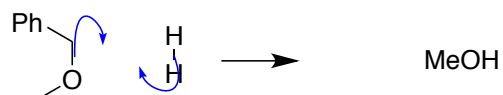
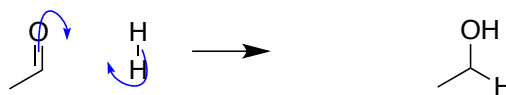
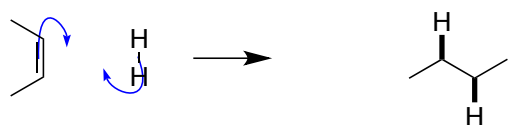
### Hydrogenation And Hydrogenolysis

*Hydrogenation* reactions

*hydrogenolysis* involve

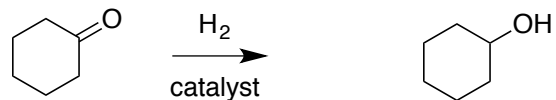
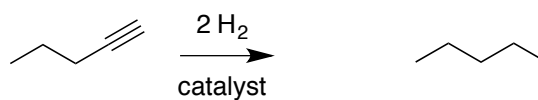
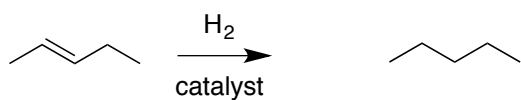
*homolytic*

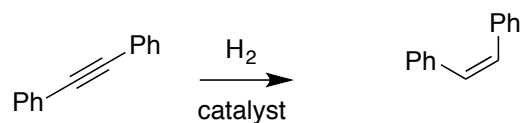
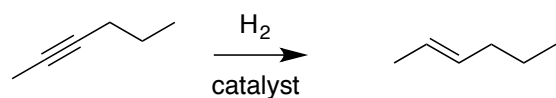
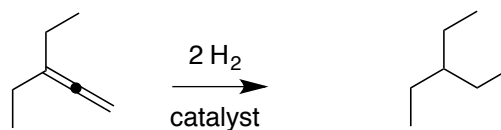
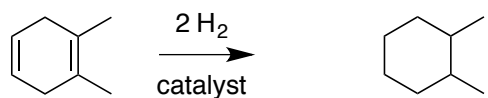
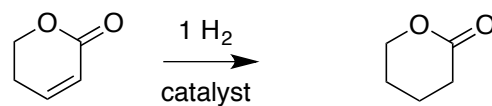
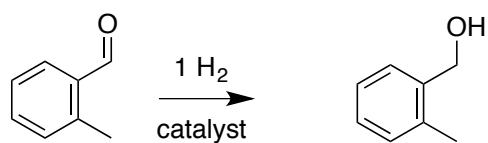
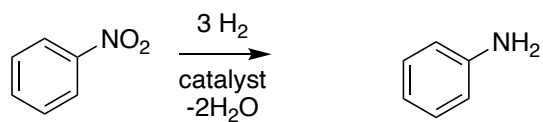
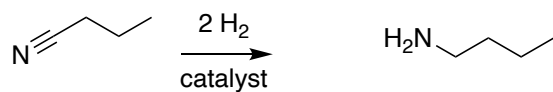
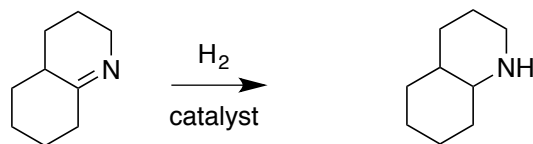
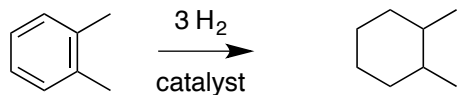
*radical* mechanism, than a *ionic*



stabilize  
benzyl  
more

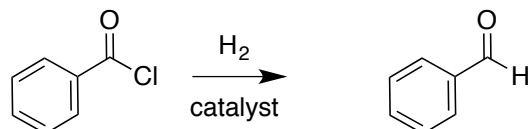
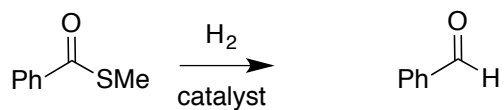
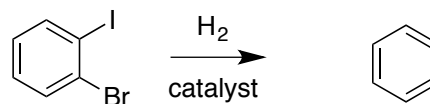
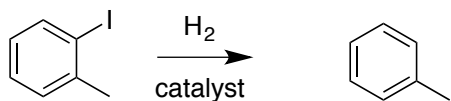
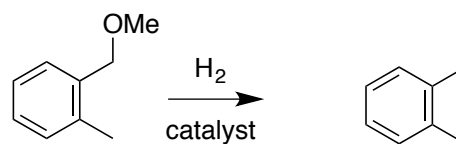
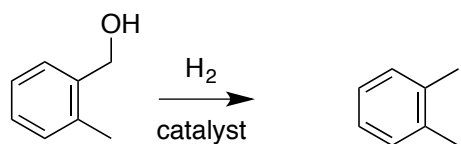
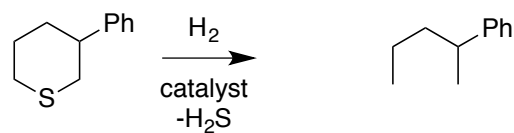
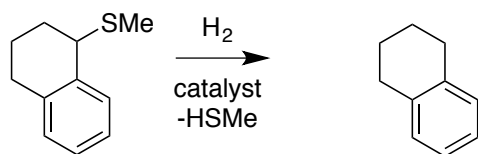
## D. Hydrogenation



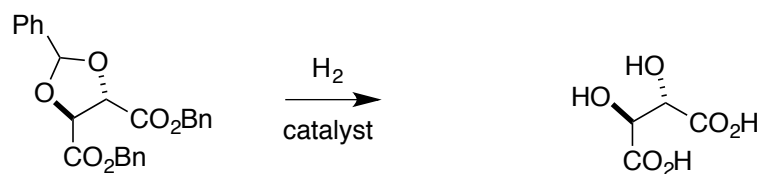
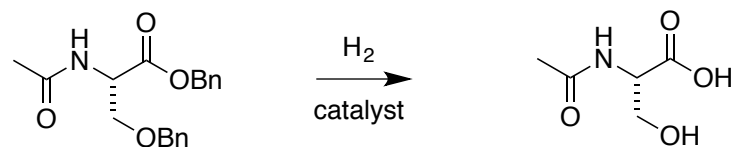
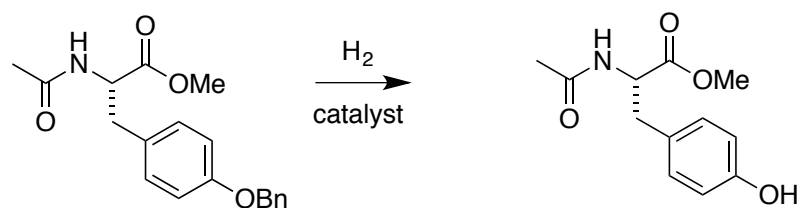
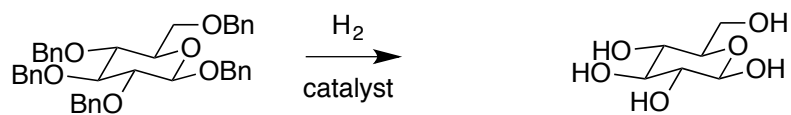


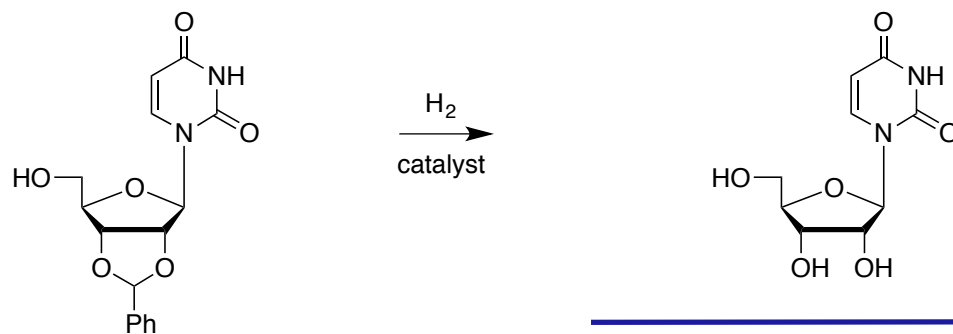
## E. Hydrogenolysis

*single*

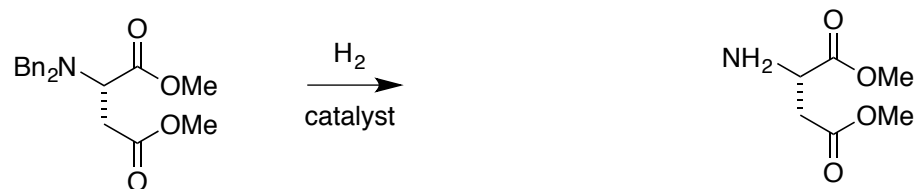


*further hydrogenolysis of these products is possible*



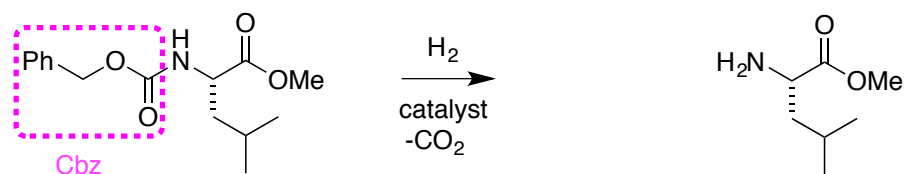


*does not reduce the base*



*harder*

Cbz.





## F. Double Bond Equivalents

1 and 2 molecules of H<sub>2</sub>

4 molecules of H<sub>2</sub>

can be calculated

can

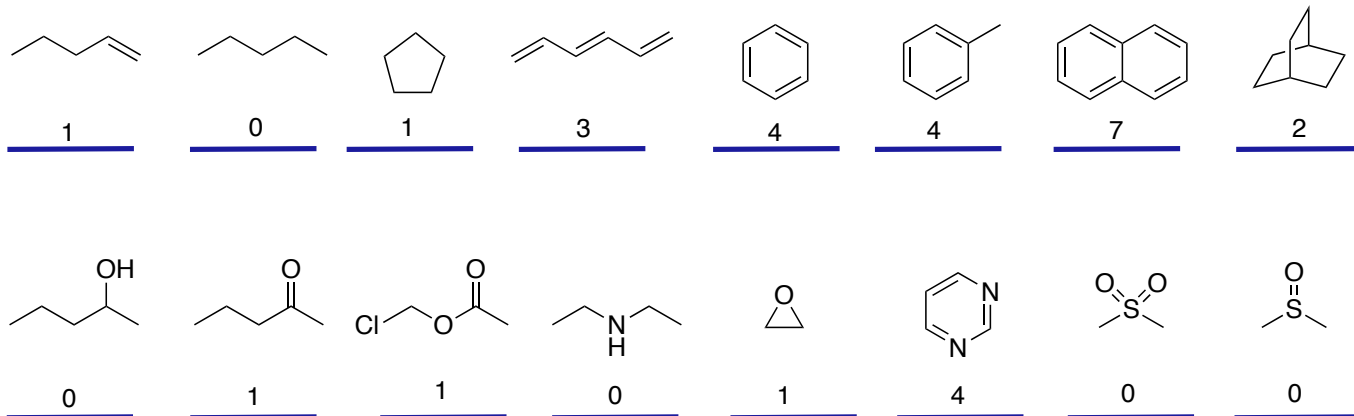
1 and 1, respectively.

(True,

1 and 4

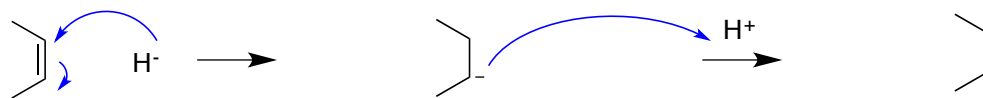
0

True,

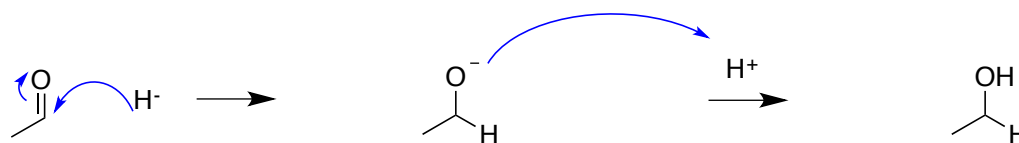


do not apply

## G. Hydridic Reductions



hard



easy