

ORGANIC CHEMISTRY 2 LECTURE GUIDE 2019

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Printed in the United States of America

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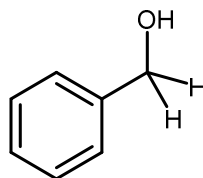
ISBN 978-0578415017 (IQ-Proton Guru)

Lesson IV.14. Oxidation and Reduction of Substituents on Benzene Rings

Alcohol oxidation and pi-bond reduction

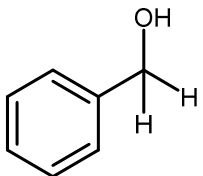
In Organic Chemistry,
Oxidation is:

A



PCC

C

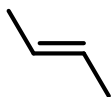


H^+/CrO_4^{2-} ,
 H^+/Cr_2O_7 , or
 CrO_3/H_2SO_4

D

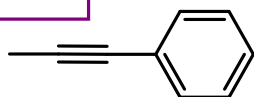
In Organic Chemistry,
Reduction is:

B



H_2/Pd

E



H_2
Lindlar's
Catalyst

F

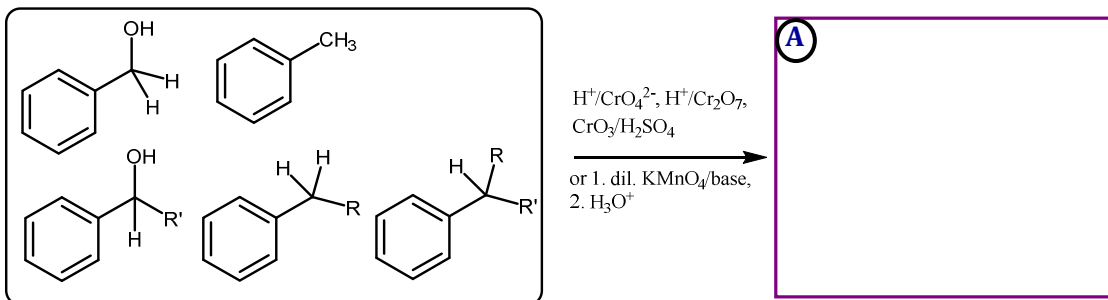
Notes

Lesson IV.14. Oxidation/Reduction of Substituents on Benzene Rings*Oxidation of benzylic sites*

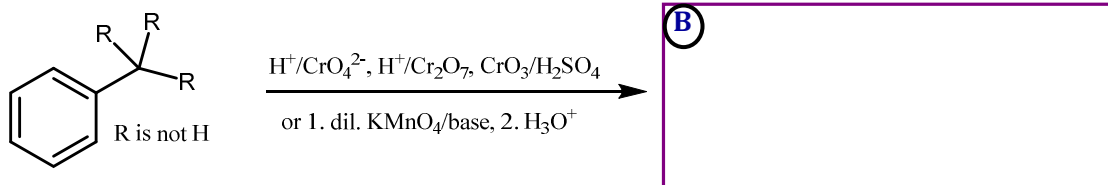
Note that MnO_2 is an oxidizing agent that will carry out reactions similar to PCC and that KMnO_4 will do reactions like the Jones Oxidation.

The benzylic site (site adjacent to benzene ring) has added reactivity:

Any of these starting materials



The benzylic carbon must have at least one H for the reaction to proceed:

Notes

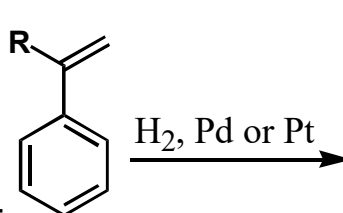
Lesson IV.14. Oxidation/Reduction of Substituents on Benzene Rings*Reduction of carbonyls*

Several functional groups can undergo reduction if they are adjacent to an aryl ring as well:

(A)

We've seen such a reaction for an alkene:

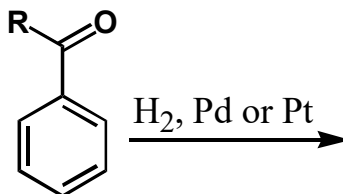
(C)



(C)

Similar reaction of a carbonyl:

(E**)



(E)

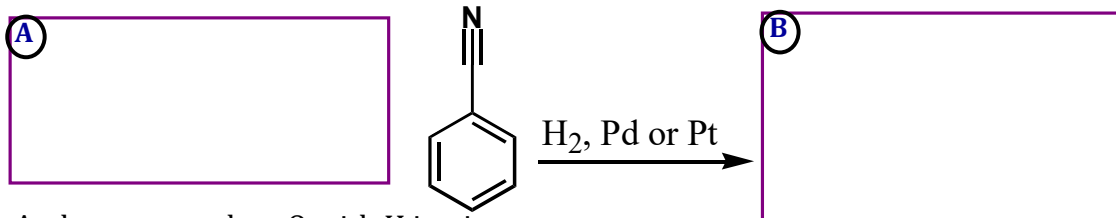
**only works if the C=O is right next to arene

Notes

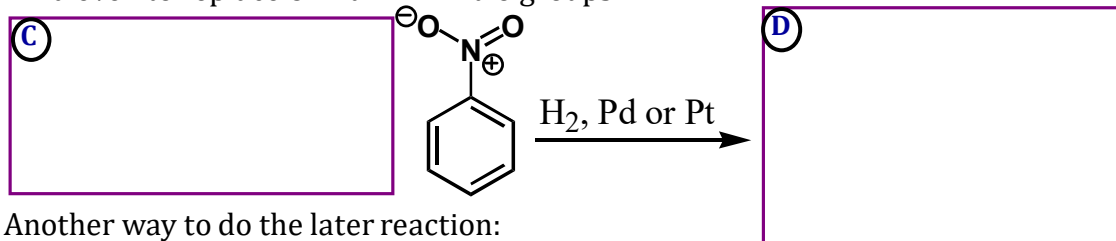
Lesson IV.14. Oxidation/Reduction of Substituents on Benzene Rings

Reduction of nitrile and nitro groups

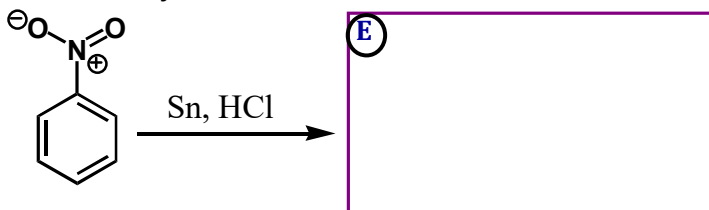
Such conditions also reduce for triple bonds to nitrogen:



And even to replace O with H in nitro groups:



Another way to do the later reaction:



Notes