

ORGANIC CHEMISTRY 2 LECTURE GUIDE 2019

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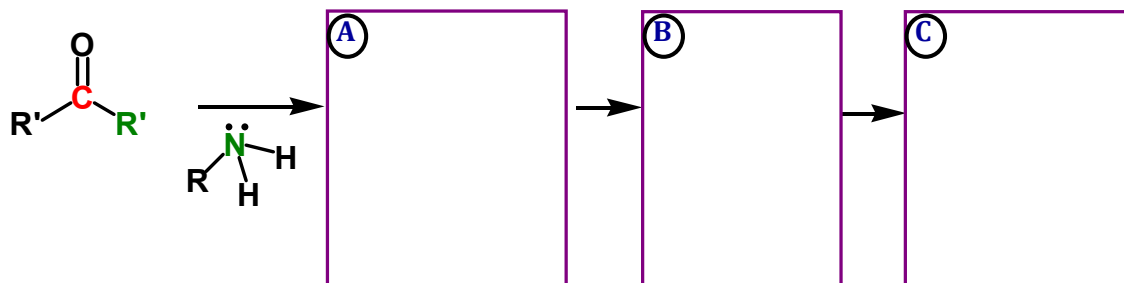
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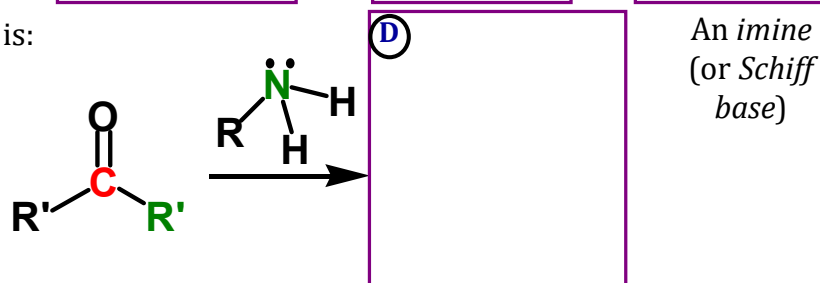
Lesson VI.7: Addition of Amine Derivatives to Aldehydes/Ketones

Imine formation

When we react a ketone with a 1° amine, we form an **imine (Schiff base)**:



So the net reaction is:



A key point:



Notes

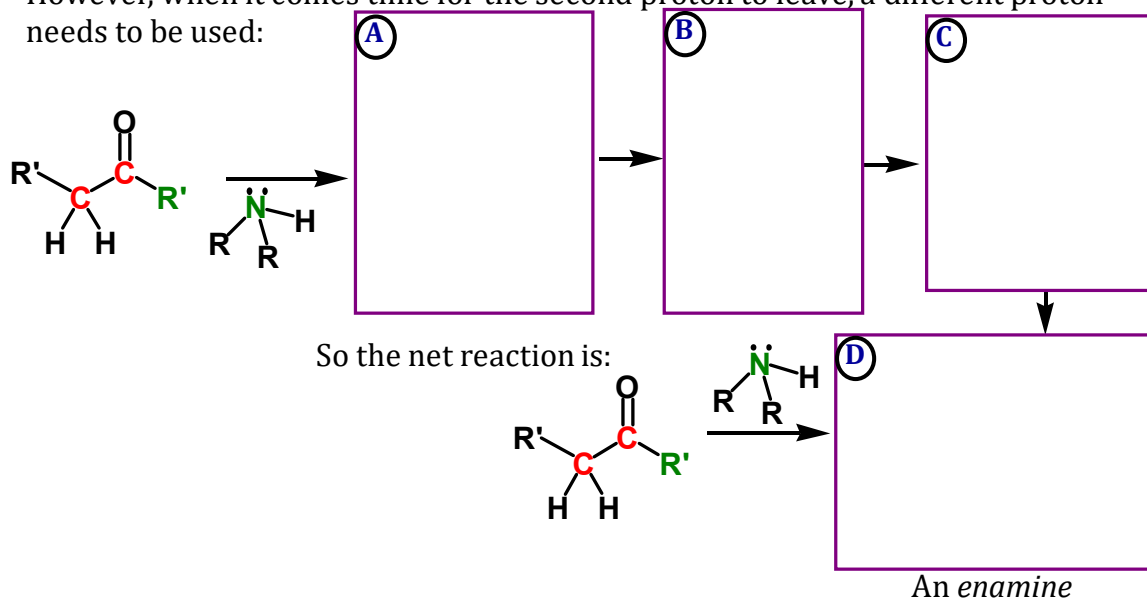
This is a Type D reaction (option II):

The carbonyl double bond to O is replaced by two bonds to NR!

Lesson VI.7: Addition of Amine Derivatives to Aldehydes/Ketones

Enamine formation

Secondary amines lack the second proton that has to leave in order to form the neutral imine, so if we react a ketone or aldehyde with a secondary amine, the initial stages of the reaction are similar to those observed on the previous slide. However, when it comes time for the second proton to leave, a different proton needs to be used:



Notes

This is a Type D reaction (option 4):

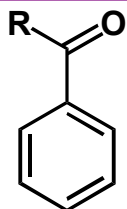
The carbonyl double bond to O is replaced by one bond to NR₂ and one bond to the α-carbon!

Lesson VI.7: Addition of Amine Derivatives to Aldehydes/Ketones

Wolff-Kishner and Clemmensen Reductions

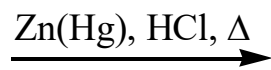
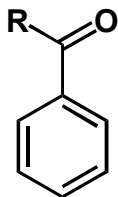
Two other ways to reduce ketones all the way to alkyl groups:

(A)



(B)

(C)



(D)

** these work on ketones that are NOT next to benzene as well (unlike H_2/Pd)

Notes

This is a Type D reaction (option I):

The carbonyl double bond to O is replaced by two bonds to H!