

ORGANIC CHEMISTRY 2 LECTURE GUIDE 2019

BY RHETT C. SMITH, PH.D.

Marketed by Proton Guru

Find additional online resources and guides at protonguru.com.

There is a lot of online video content to accompany this book at the Proton Guru YouTube Channel! Just go to YouTube and search “Proton Guru Channel” to easily find our content.

Correlating these reactions with your course: The homepage at protonguru.com provides citations to popular text books for further reading on each reaction in this book, so that you can follow along using this book in any course using one of these texts.

Instructors: Free PowerPoint lecture slides to accompany this text can be obtained by emailing IQ@protonguru.com from your accredited institution email account. The homepage at protonguru.com provides a link to citations to popular text books for further reading on each Lesson topic in this primer.

© 2006-2019

Executive Editor: Rhett C. Smith, Ph.D. You can reach him through our office at:

IQ@protonguru.com

All rights reserved. No part of this book may be reproduced or distributed, in any form or by any means, without permission in writing from the Executive Editor. This includes but is not limited to storage or broadcast for online or distance learning courses.

Cover photo courtesy of William C. Dennis, Jr.

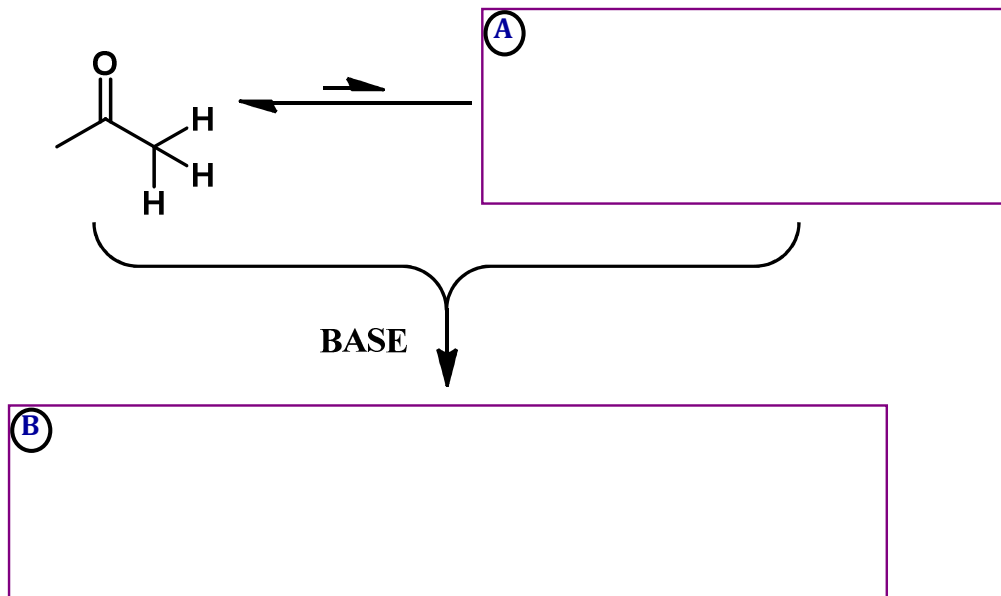
Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

ISBN 978-0578415017 (IQ-Proton Guru)

Lesson VI.15. Preparation of Enolates from Carbonyl Species*Alpha-carbons can be deprotonated*

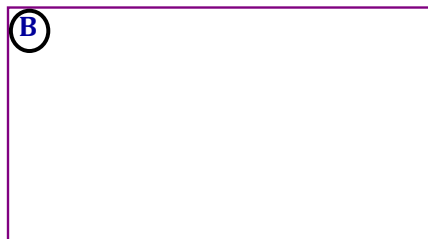
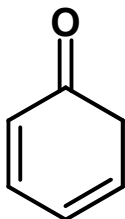
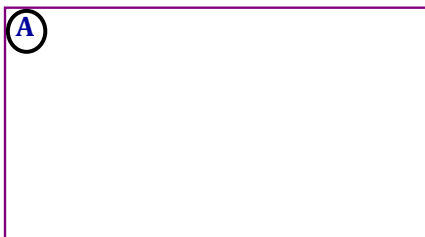
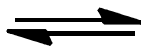
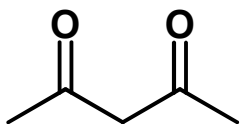
The α -position (α = alpha) is the site adjacent to the carbonyl carbon. This site can be deprotonated relatively easily because the conjugate base is stabilized by resonance:



Notes

Lesson VI.15. Preparation of Enolates from Carbonyl Species*Stabilized enolates*

When evaluating the relative stabilities of species, consider all influences. The enol form can be made more favorable, for example, if the alkene in the enol is part of a π -conjugated or aromatic system:

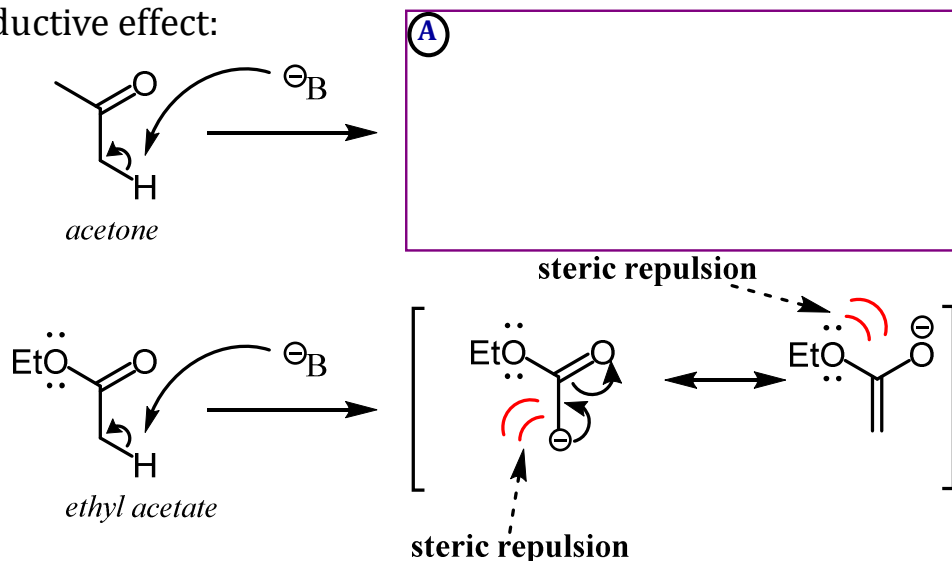


Notes

Lesson VI.15. Preparation of Enolates from Carbonyl Species

Ester enolates

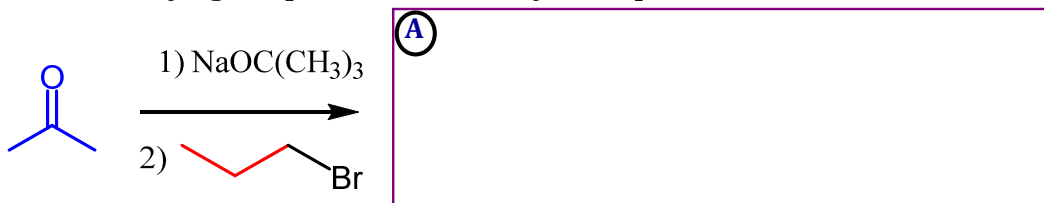
The α -position of an ester is not as acidic as the α -position of an aldehyde or ketone because its conjugate base is less stable. The lower stability of the ester enolate stems from a repulsive inductive effect:



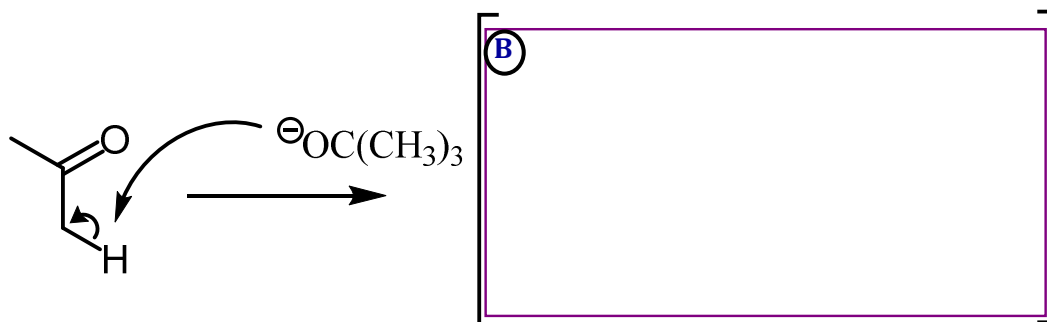
Notes

Lesson VI.15. Preparation of Enolates from Carbonyl Species*Alkylation of enolates*

Enolates can be used as nucleophiles, for example in an S_N2 reaction. This is sometimes called an α -alkylation reaction, since it adds an alkyl group to the carbonyl's α -position:



Mechanistically, the enolate is formed first:



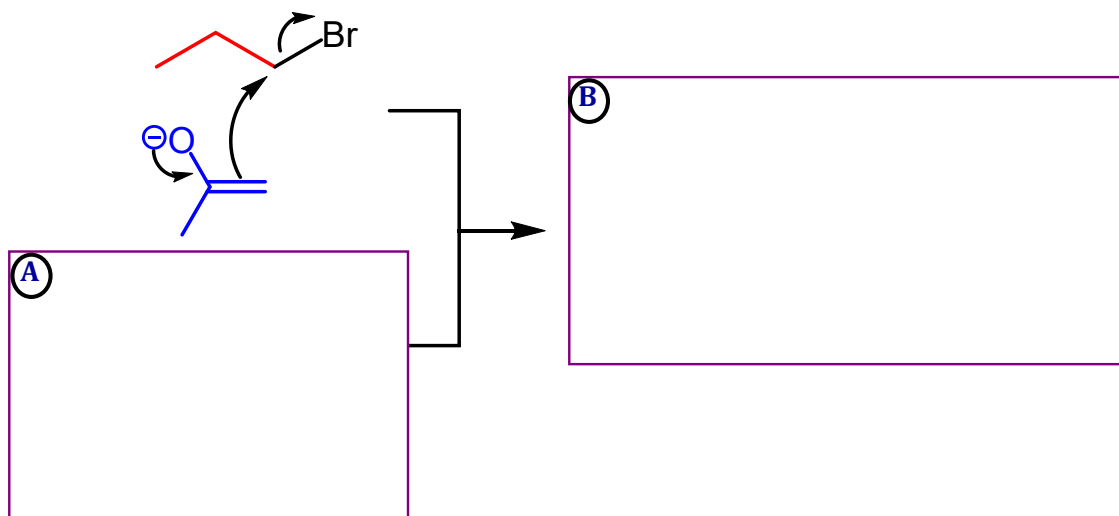
Notes

Lesson VI.15. Preparation of Enolates from Carbonyl Species

Alkylation of enolate

There are two ways that you may see nucleophilic attack by an enolate represented, depending on which resonance contributor is represented:

Two ways to represent the same S_N2 reaction



Notes