

ORGANIC CHEMISTRY 2 LECTURE GUIDE 2019

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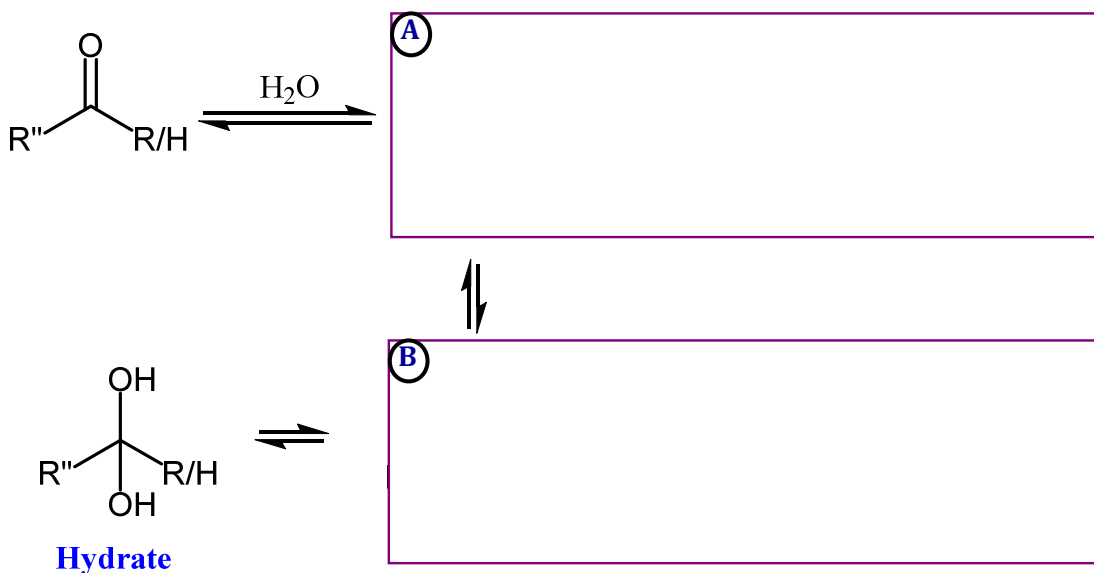
Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

ISBN 978-0578415017 (IQ-Proton Guru)

Lesson VI.6. Addition of Water or Alcohols to Aldehydes and Ketones*Water reacts with aldehyde/ketone to form hydrates*

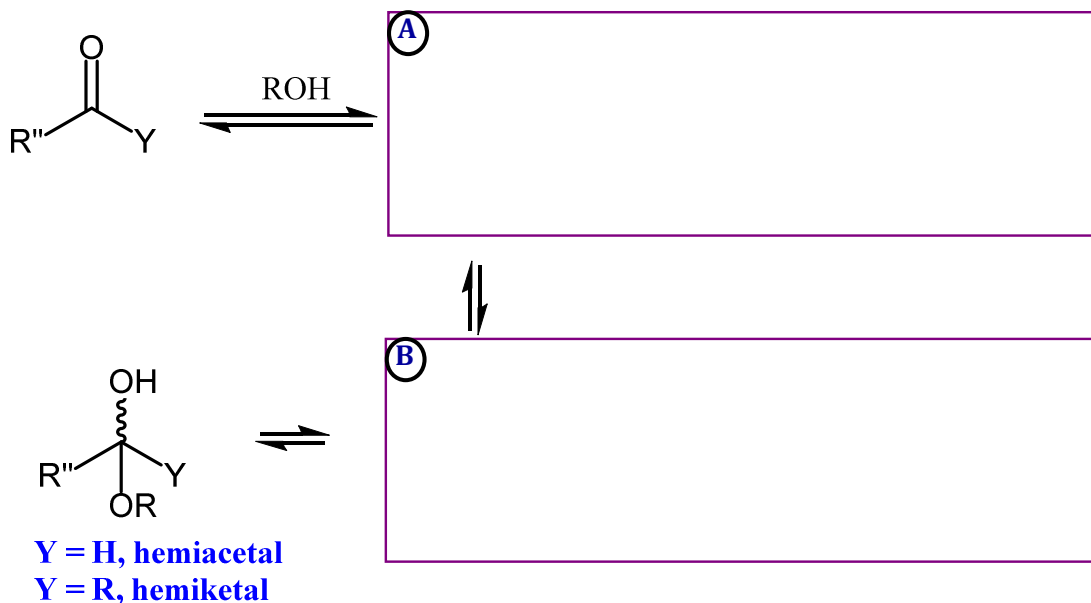
Neutral nucleophiles like water and alcohols are also capable of doing Type A reactions with aldehydes and ketones. When water is the nucleophile, a **hydrate** is formed:

Notes

Lesson VI.6. Addition of Water or Alcohols to Aldehydes and Ketones

Alcohol reaction to form hemiketals and hemiacetals

When an alcohol is the nucleophile, a **hemiacetal** is formed from an aldehyde and a **hemiketal** is formed from a ketone:

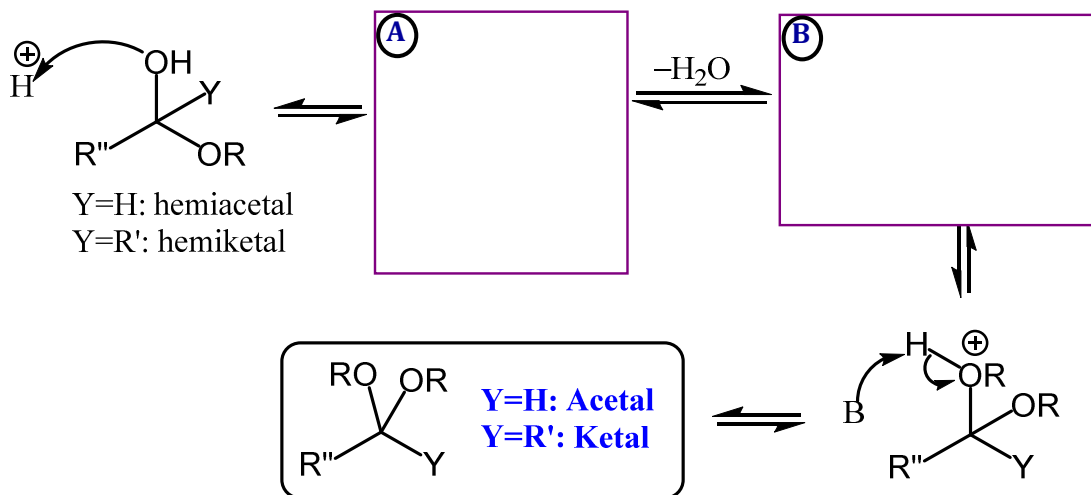


Notes

Lesson VI.6. Addition of Water or Alcohols to Aldehydes and Ketones

Excess Alcohol Pushes Reaction to Acetal/Ketal formation

We have already seen that aldehydes and ketones can react with ROH to form hemiacetals and hemiketals, respectively. If we continue reaction, aldehydes and ketones will form **acetals** and **ketals**, respectively:



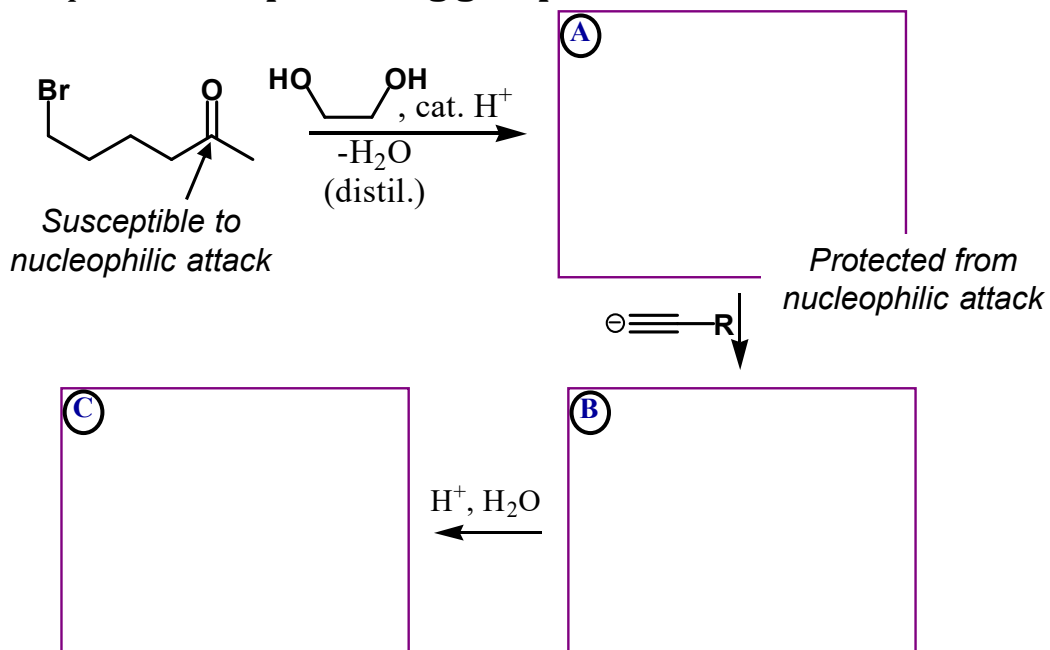
Notes

This is a Type D reaction (option I):

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

Lesson VI.6. Addition of Water or Alcohols to Aldehydes and Ketones
Acetals and Ketals as Protecting Groups

Acetals/ketals are treated in some detail by your text because of their importance as **protecting groups**:



Notes