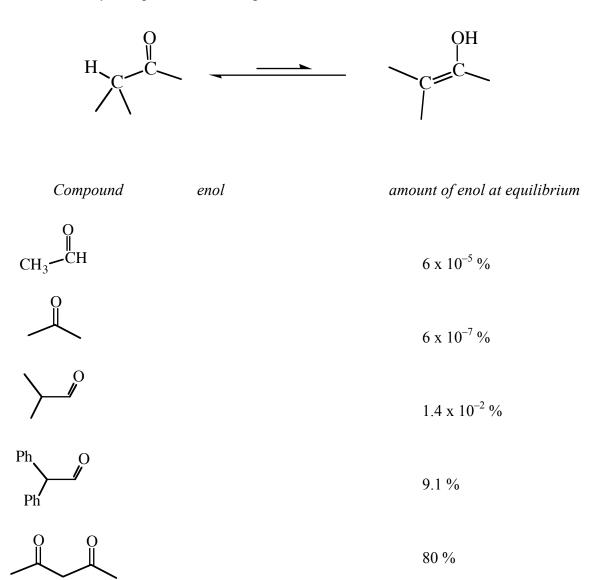
Lecture outline

Ch 20 — Rxns a to α carbonyl group enols and enolates, aldol and Claisen condensations

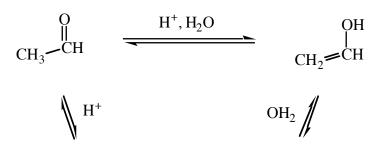
Carbonyl compounds exist in equilibrium with enol tautomers —



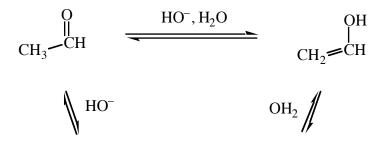
Draw the enol tautomer of each compound above and explain the variation in the position of the equilibria, reflected in the enol %s. Think about the relative stabilities of the carbonyl compound and enol and how this varies from case to case. Why is enolization so favorable for the β -dicarbonyl compound?

Enolization mechanisms (review, eh?) Fill in the details.

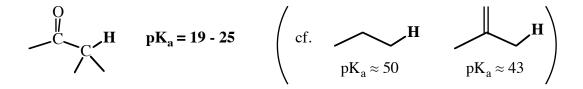
a. Acid-catalyzed



b. Base-catalyzed



Resonance stabilization makes Hs a to a carbonyl group moderately acidic



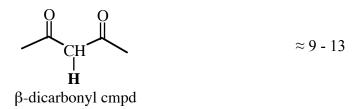
$$Cmpd$$
 pK_a

$$\sim 19 - 21$$

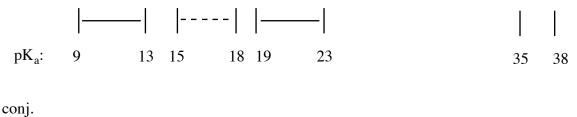
aldehyde or ketone

$$RO - C - C + H \approx 23$$
(ester)





On the number line below, put a simple carbonyl cmpd, a β -dicarbonyl cmpd, an alcohol, H₂, and NH₃ above the pK_a ranges, and then put the conjugate base of each one below the pK_a ranges for their conjugate acids.



base:

What's the point of this? A base can completely deprotonate any acid to the left/right (pick one).

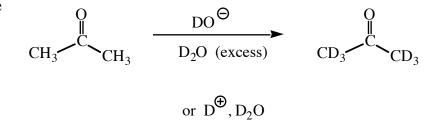
What bases can quantitatively deprotonate a ketone?

... and which ones can deprotonate a ketone to a small extent?

What bases can quantitatively deprotonate a β -dicarbonyl compound?

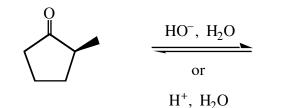
Reactions of enols and enolate ions

1. H-D exchange



write the mechanisms

2. Stereoisomerization



111111

