Characteristics Of Enols and Enolates

from chapter(s) _____ in the recommended text

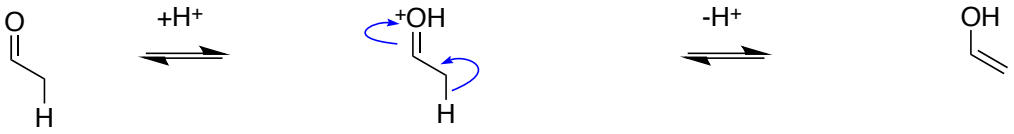
A. Introduction

B. Enols Form Under Acidic Conditions

Mechanism Of Formation

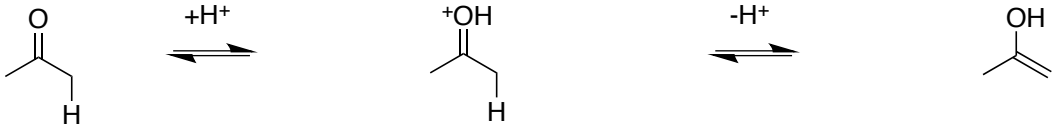
protonation

enol.



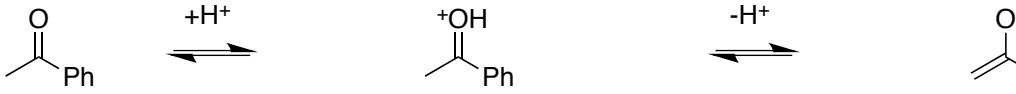
protonated carbonyl

enol form

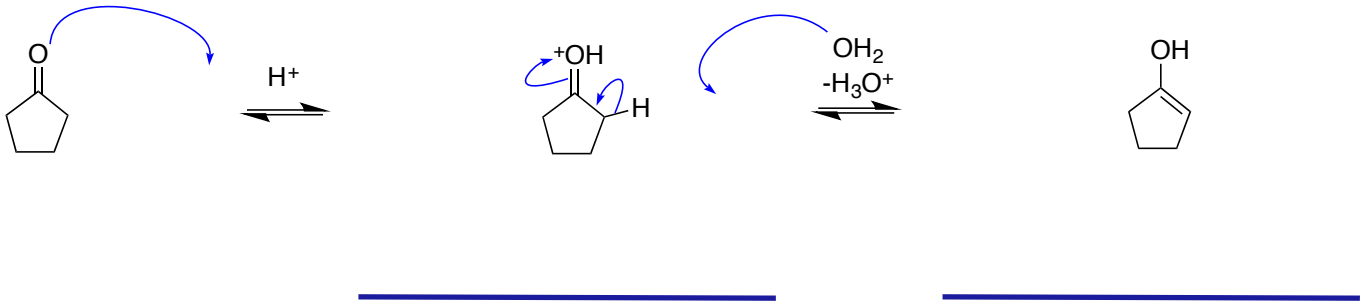


protonated carbonyl

enol form

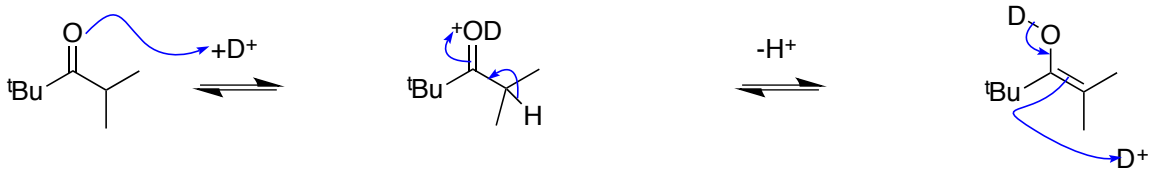


enol


O
H+
+OH
H
OH2
-H3O+
OH

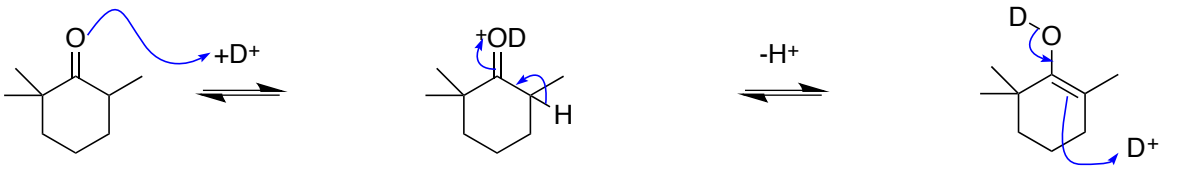
Deuterium Exchange

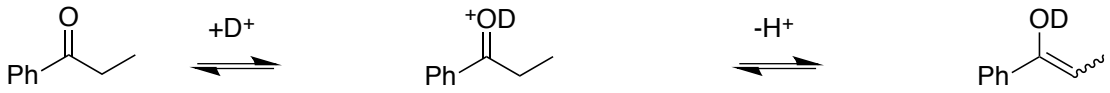
deuterons.



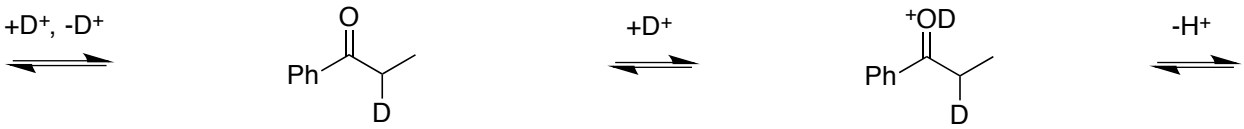
deuterated carbonyl *enol form*

deuterated product

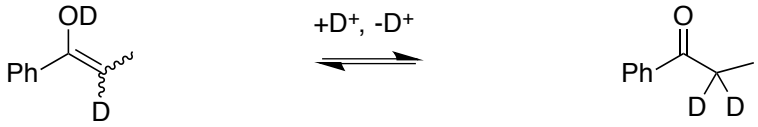




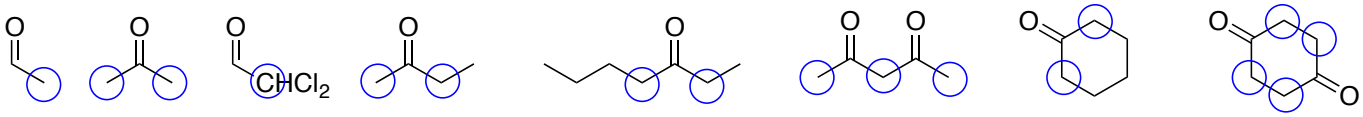
O-deuterated carbonyl *O-deuterated enol*



C-deuterated ketone *O-deuterated carbonyl*



enol form *dideuterated ketone*



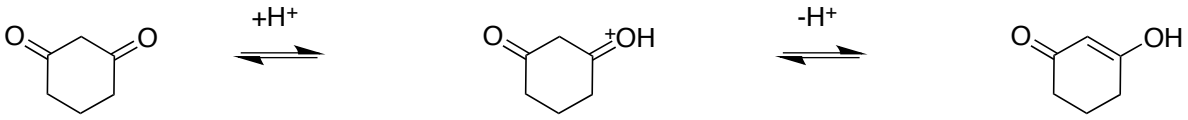
tautomerism;

Enols Of 1,2- And 1,3-Dicarbonyl Compounds

keto form

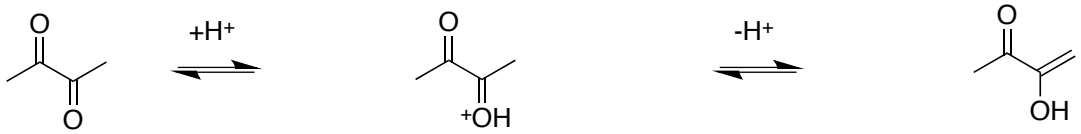
10^6 : 1.

enol



protonated carbonyl *enol form*

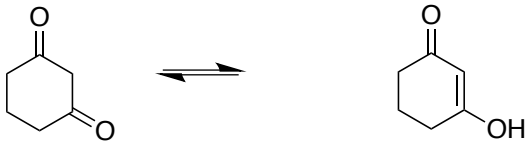
reason: Enolization of 1,3-cyclohexanedione forms conjugation between carbonyl and C=C which is stabilized by resonance, while the acetone does not have resonance effect.

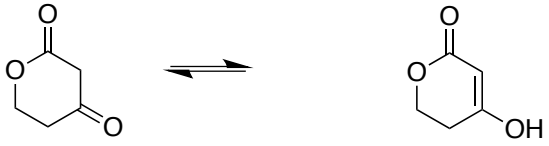


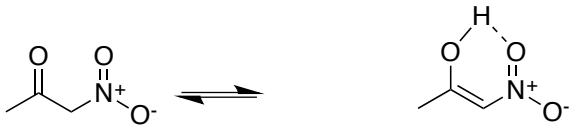
reason: Compared to acetone, one carbonyl group in the 2,3-butanedione acts as electron withdrawing group that enhances acidity of α-H.

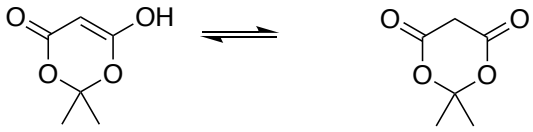
.

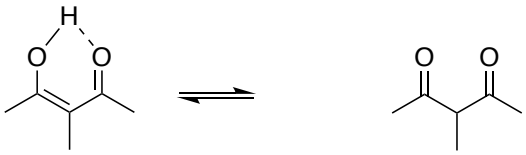
conjugates

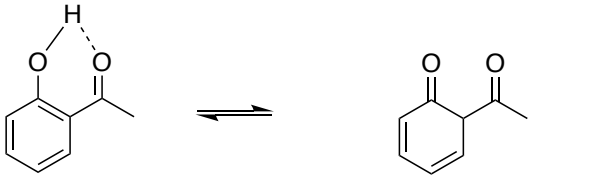


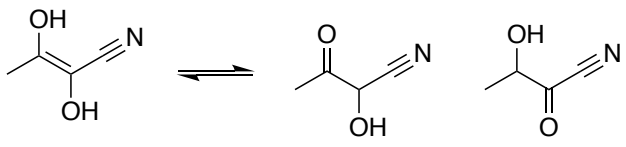






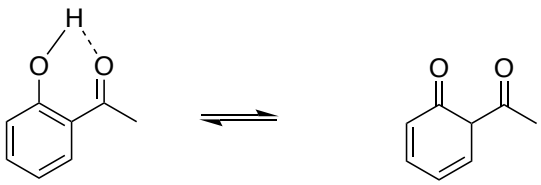


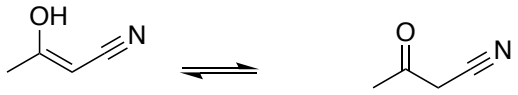




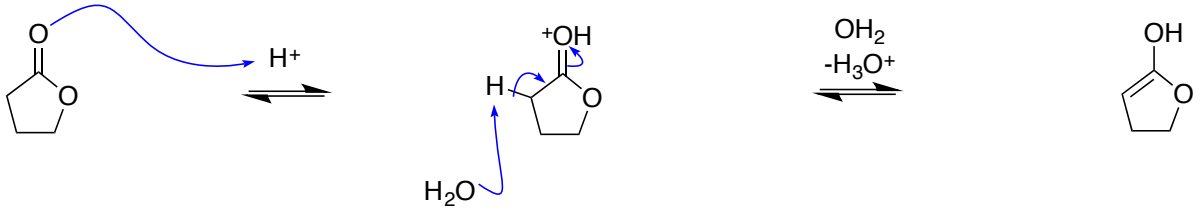
best *second best*

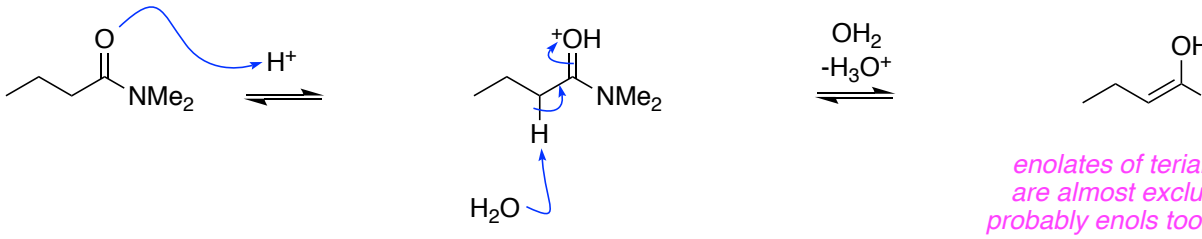
In the print the question above right will be changed to the following:


H
O
O
O
O

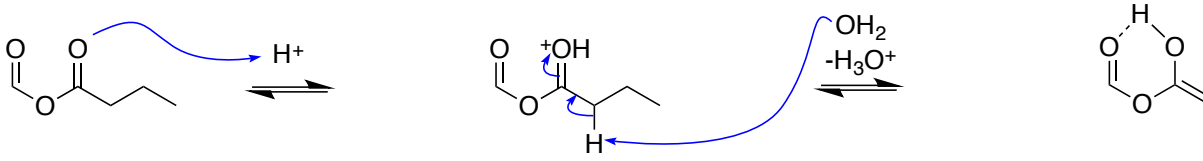

OH
N
O
N

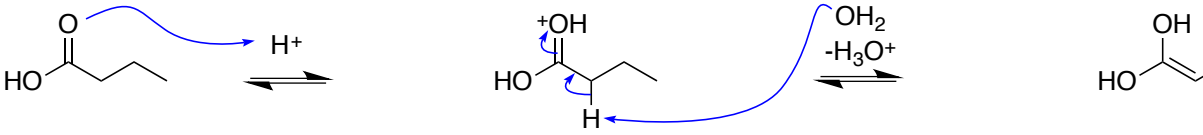
Enols Of Other Carbonyl Compounds



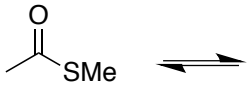


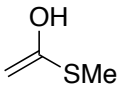
enolates of teriary amides are almost exclusively cis, probably enols too under most conditions



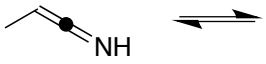


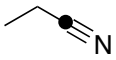
Keto-Enol Tautomers Of Other Compound Types



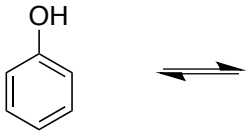


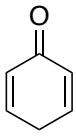
enol



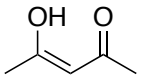


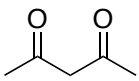
keto



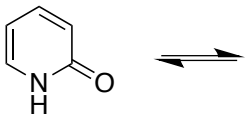


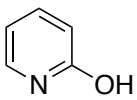
keto



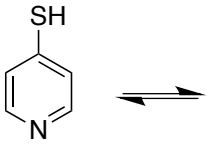


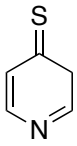
keto



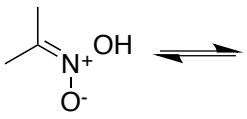


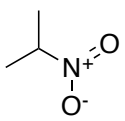
enol



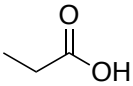


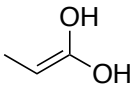
keto





keto





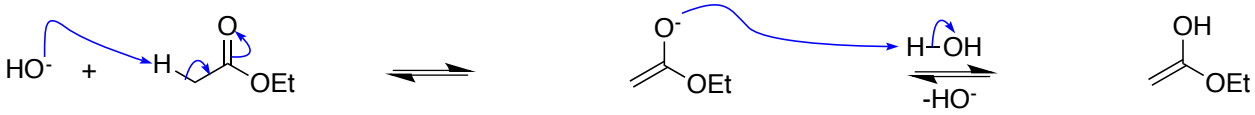
enol

incorrect

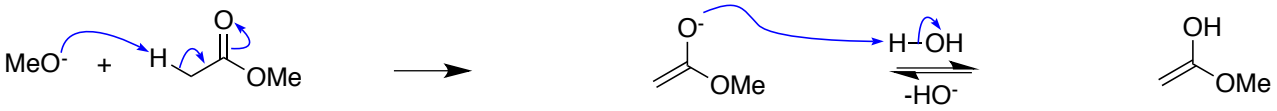
they are not resonance structures.

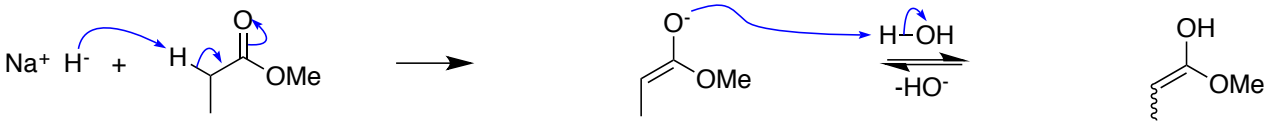
C. Enolates Form Under Basic Conditions

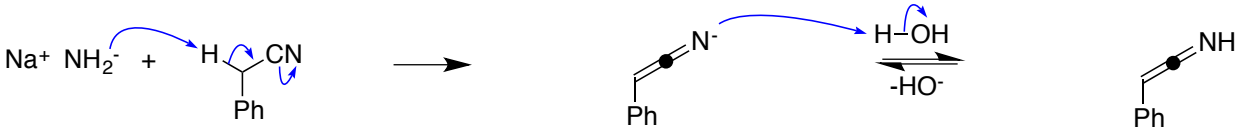
Mechanism Of Formation

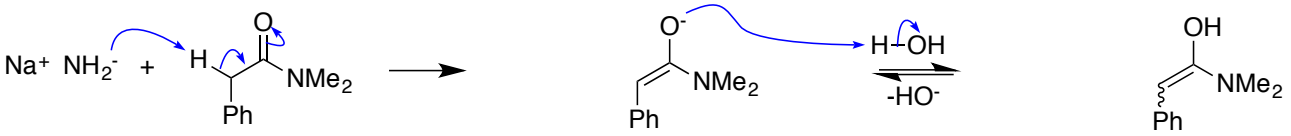


enolate *enol*

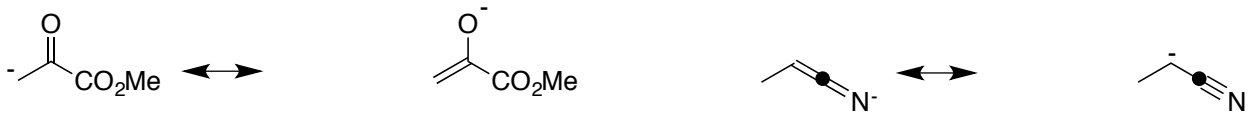


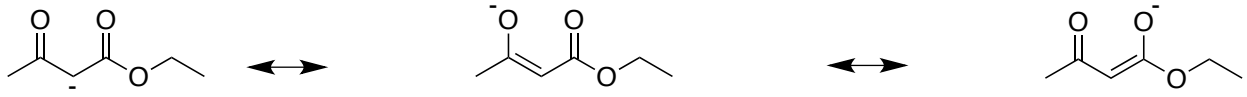


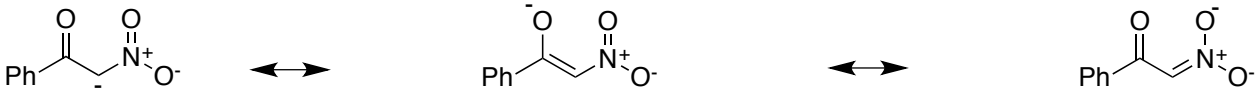




Resonance Structures Of Enolates

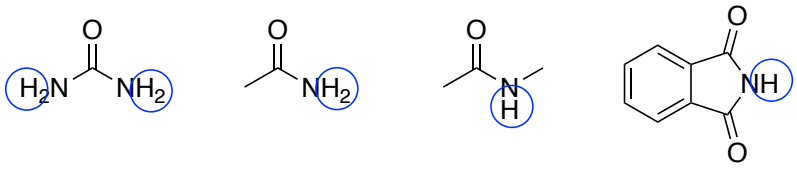






more

more



It *is not* easy

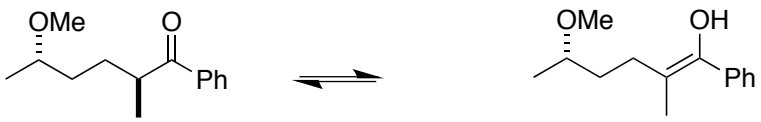
N-anions instead.

D. Effects Of Enolization

Racemization

optically active

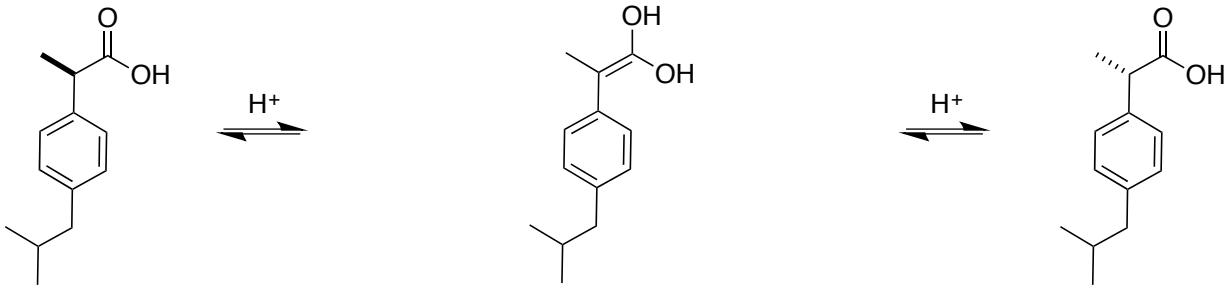
achiral



optically active

optically active

can racemize

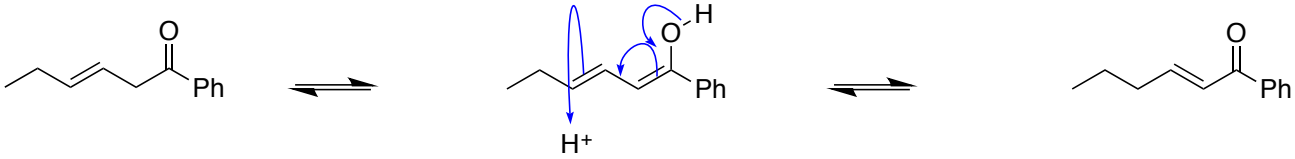


ibuprofen

enol

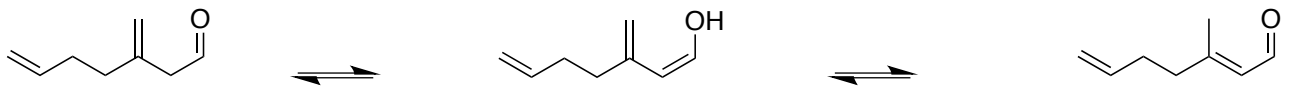
Double Bond Migration

Migration

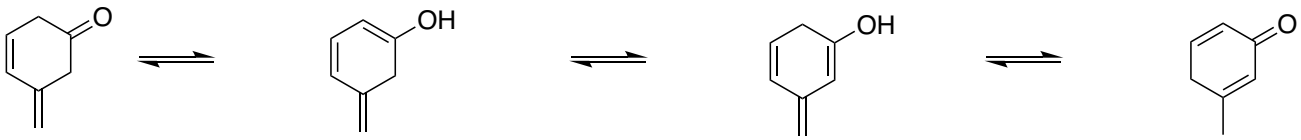


enol

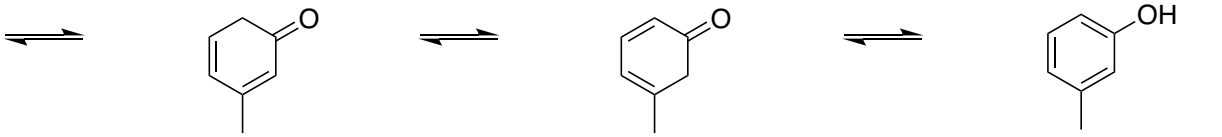
keto



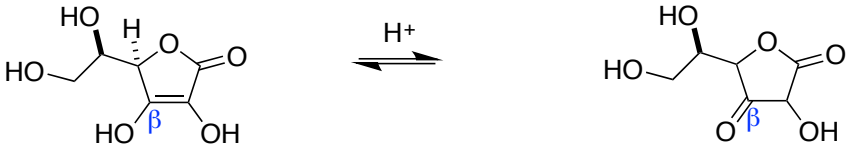
enol *keto*



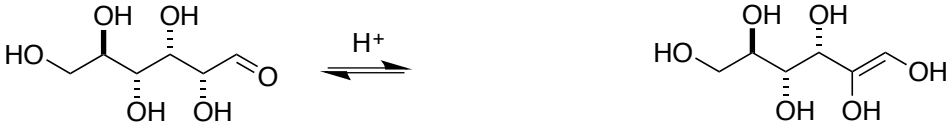
enol *enol* *keto*



keto *keto* *phenol*

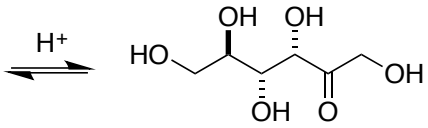


keto



glucose

enol



fructose