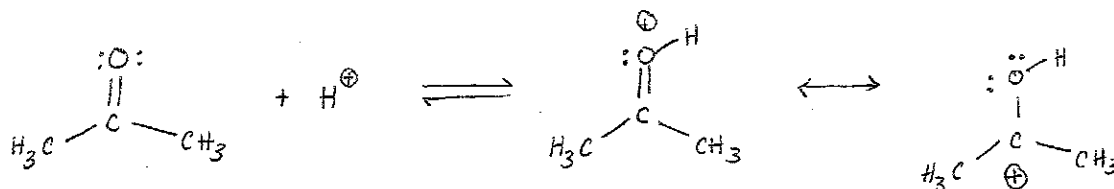
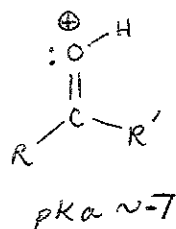


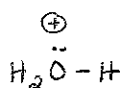
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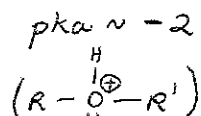
Recall: Rxns of aldehydes / ketones....

 $\rightarrow$ weak basespKa values -

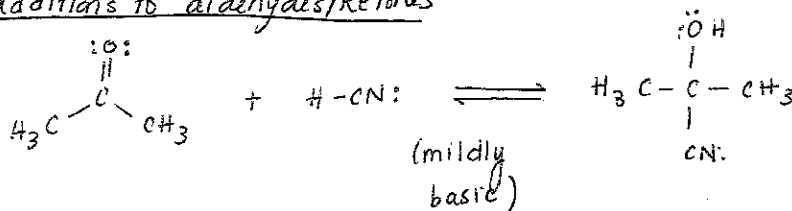
vs



water / alcohols / ethers are stronger
bases than aldehydes or ketones

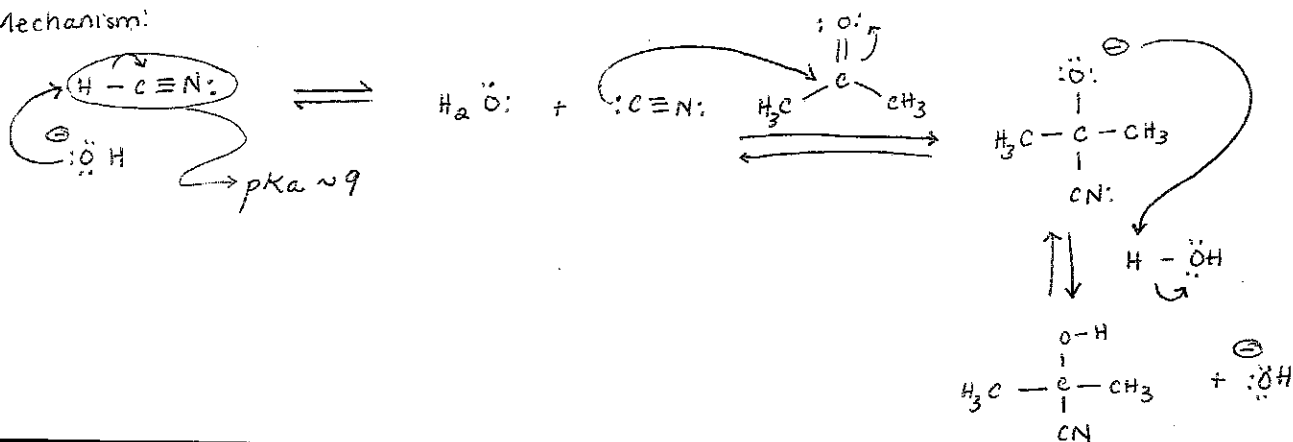
Reversible additions to aldehydes / ketones

Example:



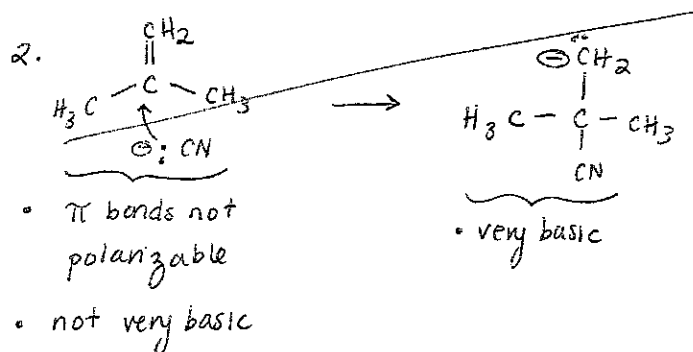
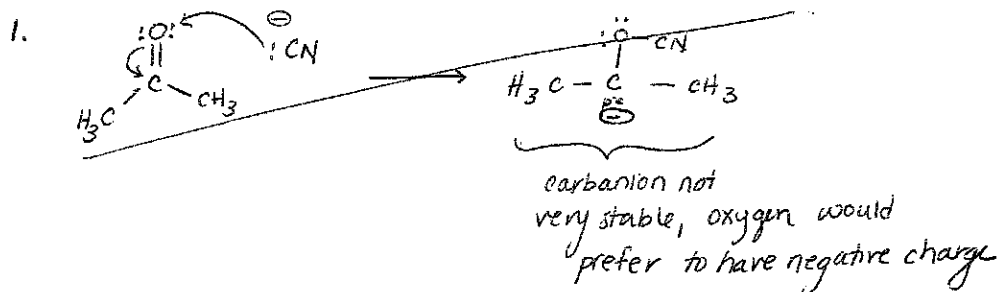
"a cyanohydrin"

Mechanism:

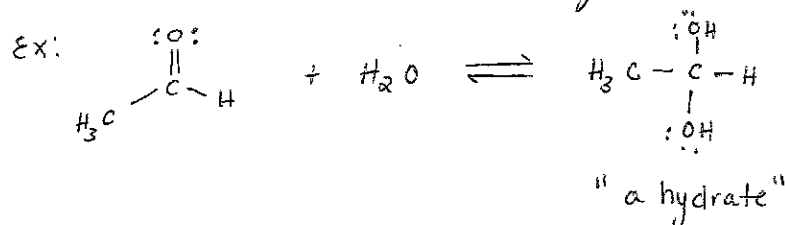


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Consider nucleophilic attack steps that do NOT occur:

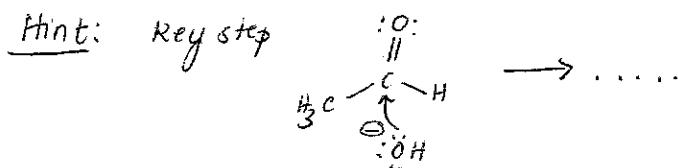


Another reversible addition to aldehyde/ketone: Hydrate Formation



* Hydrate formation can occur under basic or acidic conditions.

You fill in basic mechanism

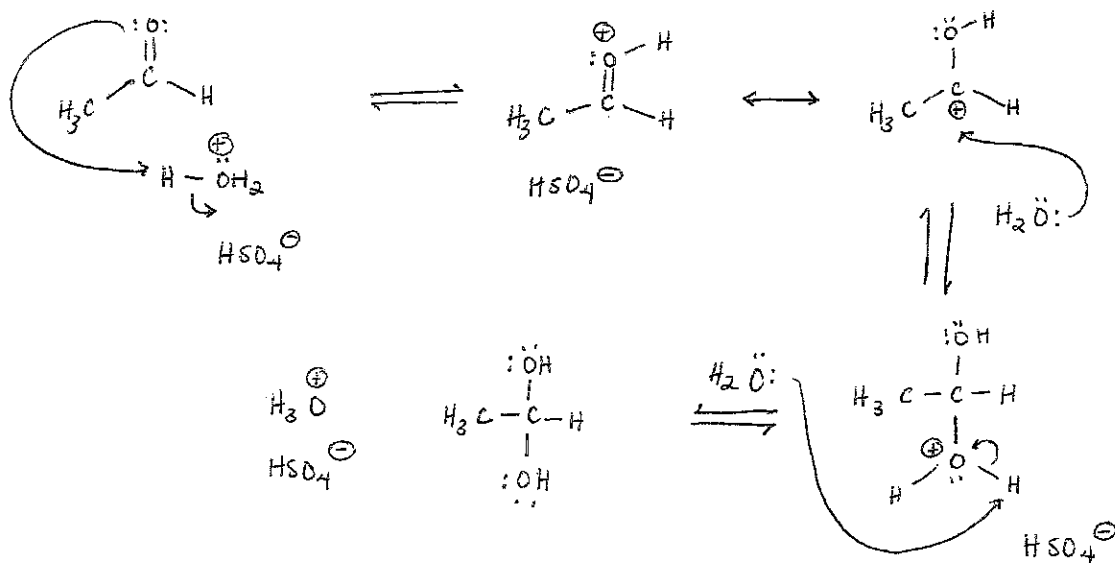


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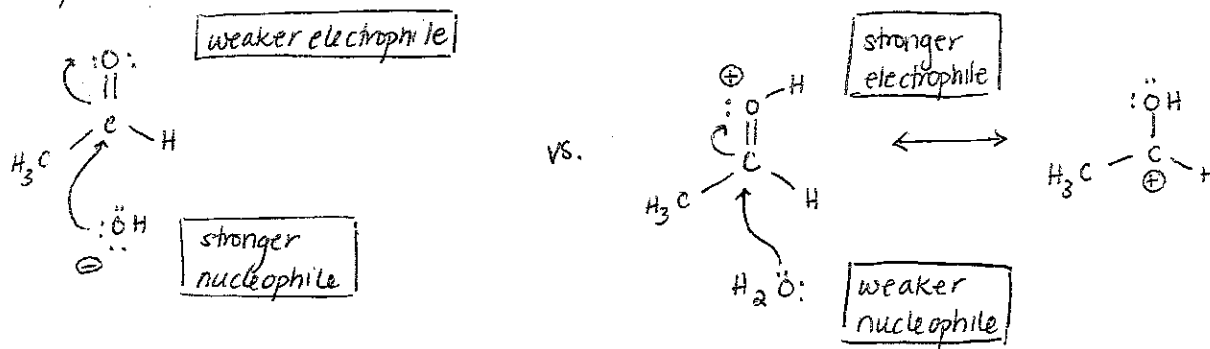
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Hydrate Formation:

Mechanism under acidic conditions:

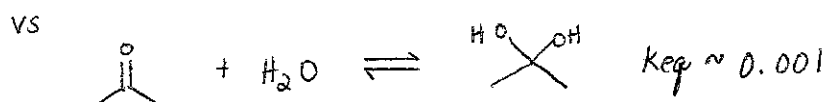
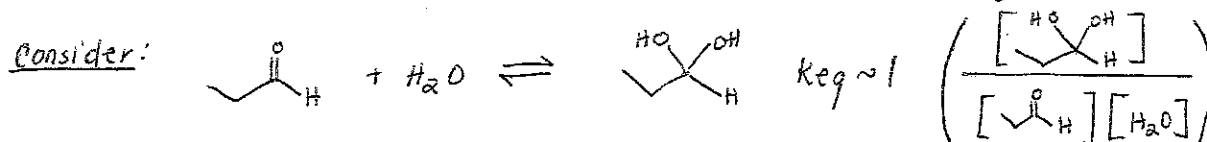


Compare nucleophile attack steps, basic vs. acidic conditions

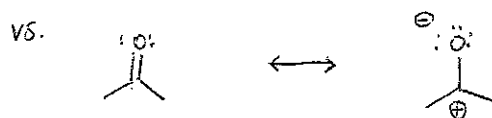
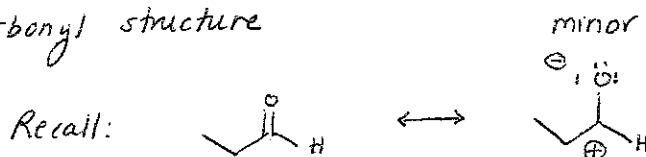


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Position of the hydrate equilibrium is strongly influenced by structure of ketone/aldehyde
 - rationalize trends based on prior knowledge (c^+ stability trends)



Rationale: based on consideration of carbocation resonance contributor to carbonyl structure



* No c^+ resonance structure in hydrates $\therefore$ more stabilized c^+ form
 $\rightleftharpoons$ less tendency to form hydrate

* This concept can be extended to many other hydrate comparisons