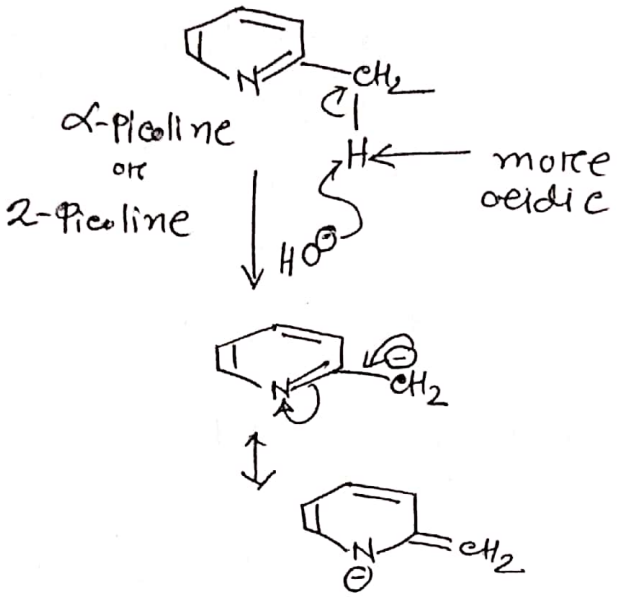
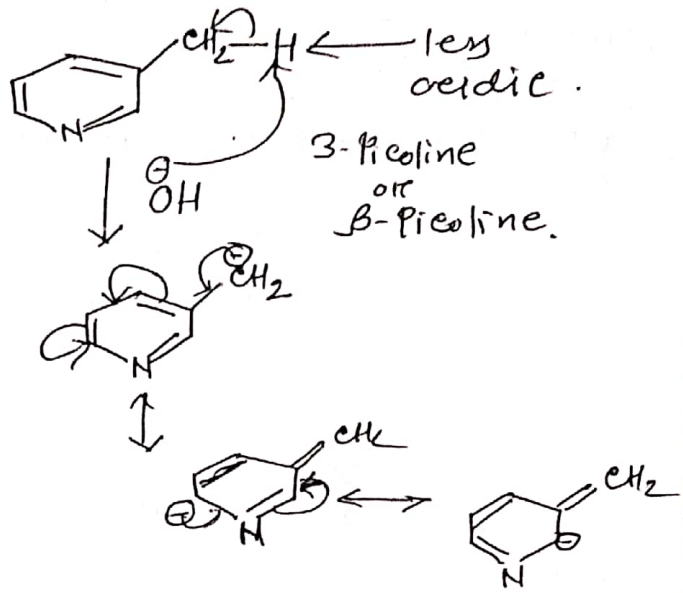
Acidity and Basicity

* 2-Picoline is more acidic than 3-Picoline. Explain.



Conj. base more stable, as resonating str. involves -ve charge on more electronegative N-atom.



Conj base is less stable as there is no -ve charge on N atom.

So, α-Picoline is more acidic than β-Picoline.

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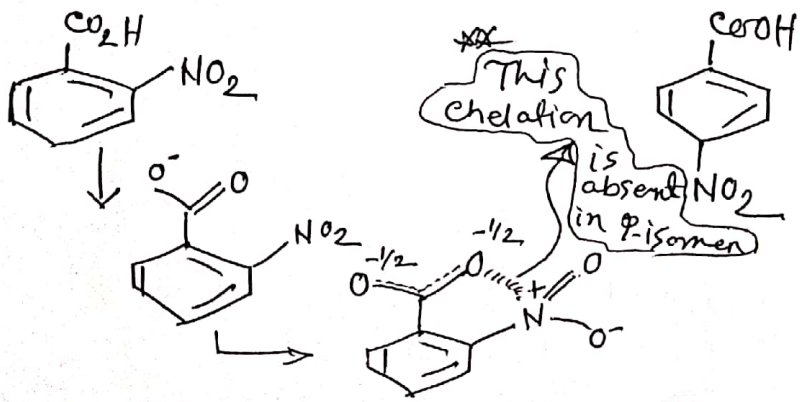
* Compare the acidity betwn ortho nitro benzoic acid and para nitro benzoic acid.

In most cases ortho derivatives are more acidic than para derivatives.



In Both cases NO_2 gr by it's -I and -R effect decreases the bond strength of O-H gr. of CO_2H group.

So due to extra stabilization by chelation betwⁿ $O^{\ominus}$ of $CO_2^{\ominus}$ gp. and $N^{\oplus}$ of NO_2 gp. the conjugate base of 2-nitro benzoic acid is more stable than that of 4-nitro benzoic acid. Consequently ortho isomer is more acidic.

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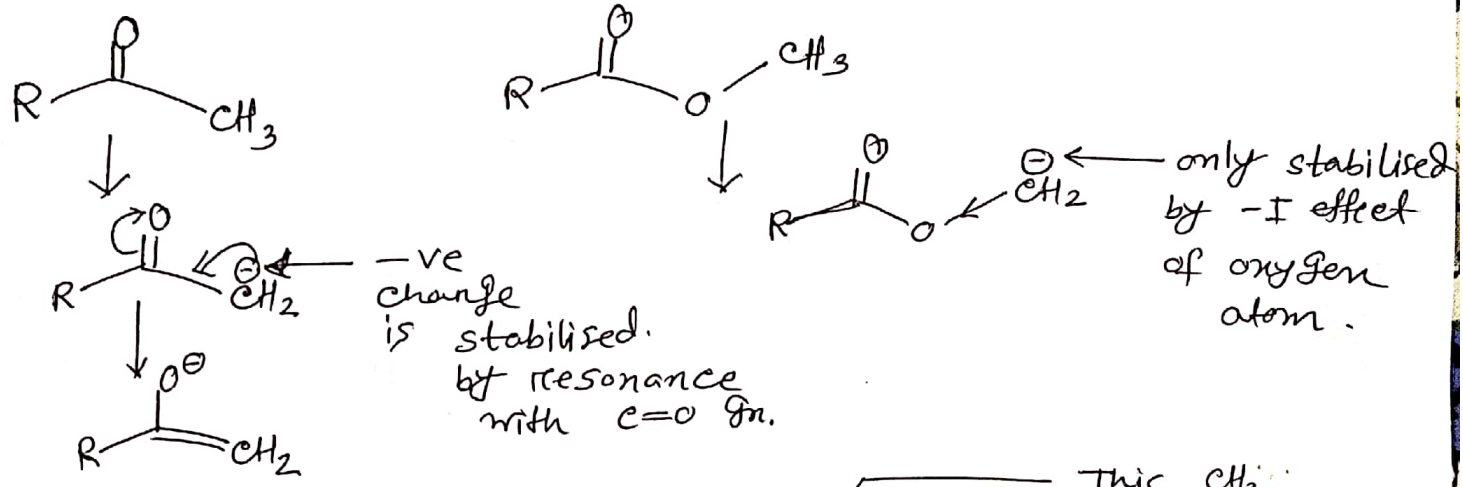
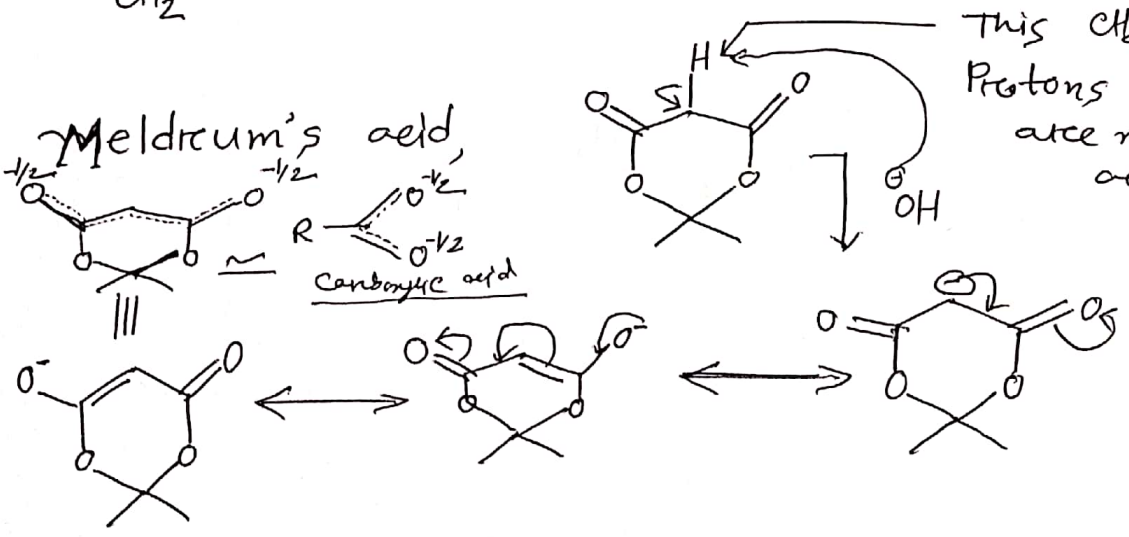
* Ketones have lower pKa value than ester, but Meldrum acid being a cyclic ester is more acidic. Explain.



Now, Meldrum's acid,



Hence, conjugate base of Meldrum's acid resembles a carboxylate anion (like carboxylic acid) and they shows acidity more.

(Also compare resonance hybrid)