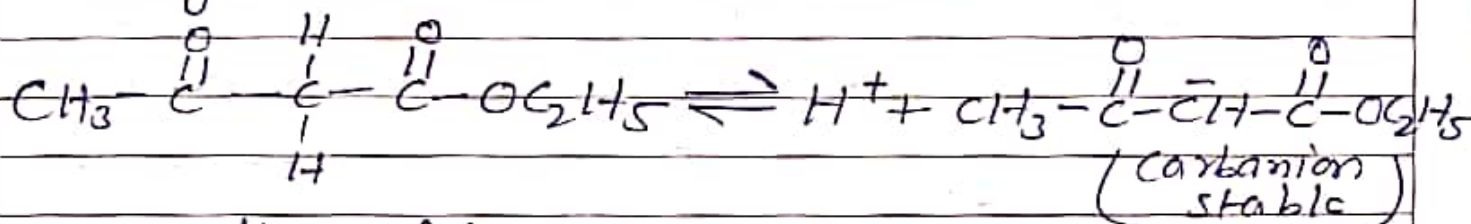


Acidity of methylene hydrogen:

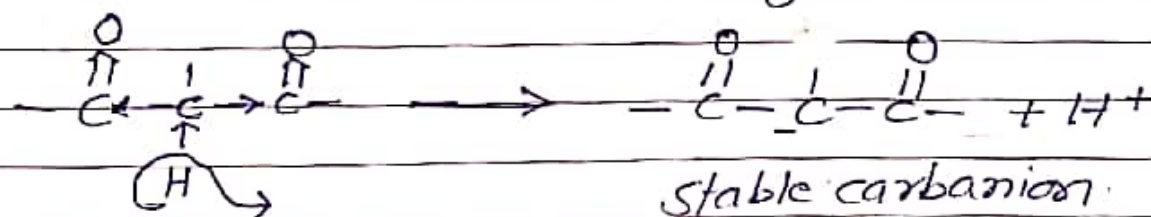
In ethyl acetoacetate methylene group (-CH₂-) flanked by two carbonyl groups. The C-H bond in CH₂ group is readily ionisable because the proton removal forms a very stable carbanion.



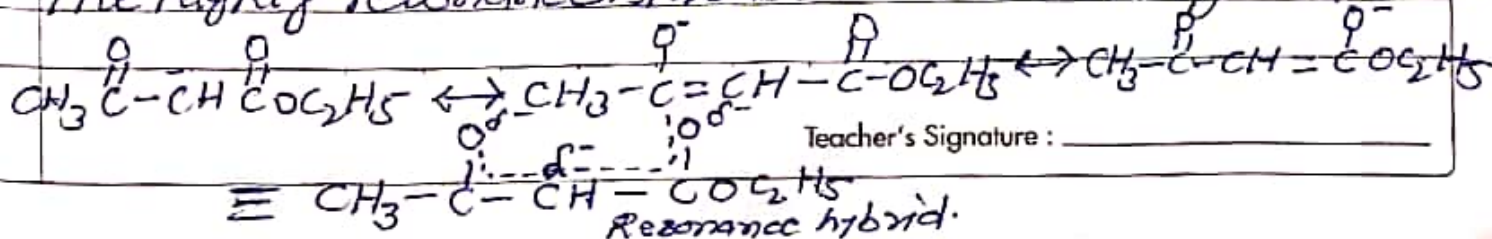
The acidity of the C-H bond in methylene group is attributed to two factors:

(i) Inductive effect:

The inductive effects caused by the electron attracting power of the electro-negative oxygen of the two carbonyl groups weakens the C-H bonds. Thus the hydrogen atom can dissociate to give a stable anion.

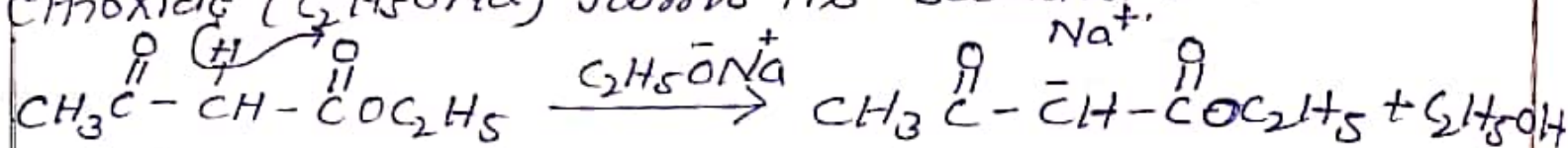
(ii) Resonance stabilisation of carbanion:

The acidity of C-H bond is greatly enhanced because the negative charge in the carbanion is delocalised into the two carbonyl groups by resonance. The highly resonance stabilised carbanion may be represented as



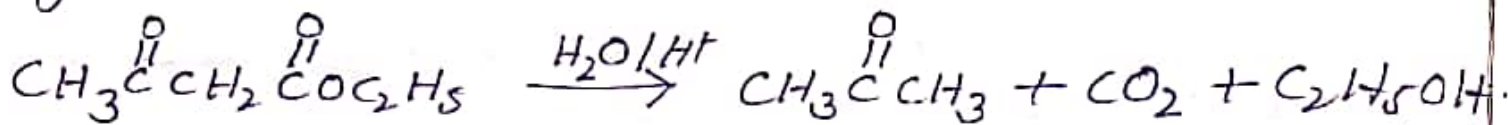
Salt Formation: →

Ethyl acetoacetate is appreciably acidic and when treated with a strong base such as sodium ethoxide (C_2H_5ONa) forms its sodium salt.



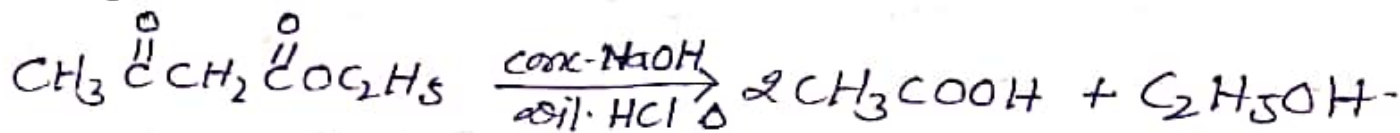
Ketonic Hydrolysis: →

When ethyl acetoacetate is hydrolysed with a dilute mineral acids, $COOC_2H_5$ is converted to $COOH$ and acetoacetic acid. It decarboxylates on heating to give acetone.



Acid Hydrolysis: →

When boiled with concentrated sodium or potassium hydroxide and then acidified with dil. HCl , EAA gives acetic acid.



This hydrolysis is known as Acid hydrolysis.

Succinic Acids: →

The reaction of sodium acetoacetic ester with ethyl chloro acetate ($ClCH_2COOC_2H_5$), and subsequent acid hydrolysis gives succinic acid.

