

SUBJECT - CHEMISTRY
 CLASS - B.Sc (Hons) PART - II
 PAPER - IV

TOPIC - Ethyl acetoacetate (EAA)

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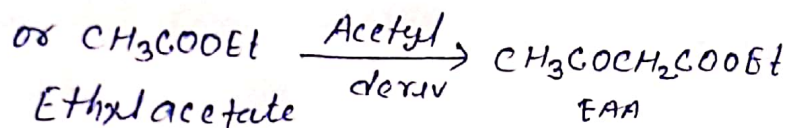
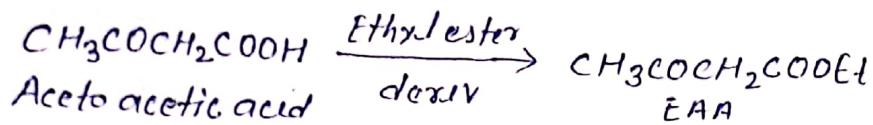
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Q. What is ethyl acetoacetate (EAA)?

(b) How is ethyl acetoacetate prepared in laboratory.

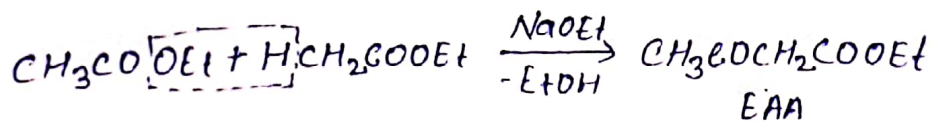
Describe the mechanism of the reaction.

Ans. It is represented as EAA. This is the ethyl ester of acetoacetic acid or acetyl derivative of ethyl acetate:



(b) Preparation:

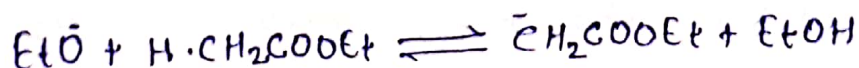
EAA is prepared by the Condensation of two molecules of ethyl acetate in the presence of Sodium ethoxide (NaOEt) base



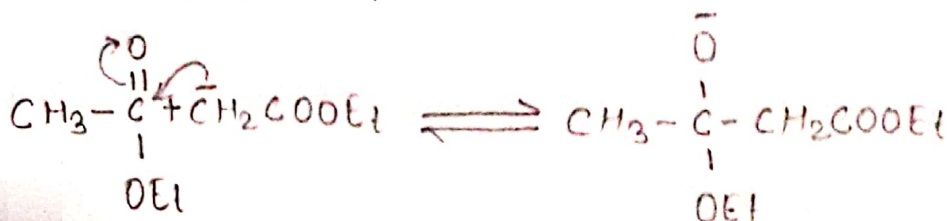
This reaction is called Claisen Condensation

Mechanism

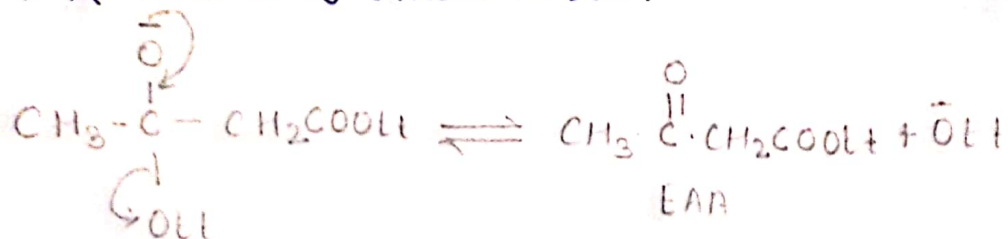
(1) formation of Carbanion



(2) Nucleophilic attack of the Carbanion on the Carbonyl C-atom of the ester.



(3) Removal of ethoxide ion:



Procedure: Pure and dry ethyl acetate and clean Na (10:1) are placed in a R.B flask. A little alcohol is added to it. The flask is refluxed on a water bath till the disappearance of Na. The semisolid mass is obtained on cooling this is treated with dilute acetic acid until acidic. on standing, The top oily layer is separated on fractional distillation, It gives ethyl acetate at 78°C and EAA at 181°C. The latter is further purified by vacuum distillation.