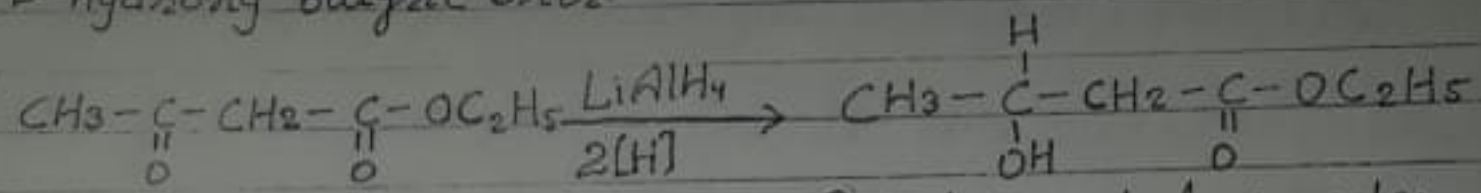


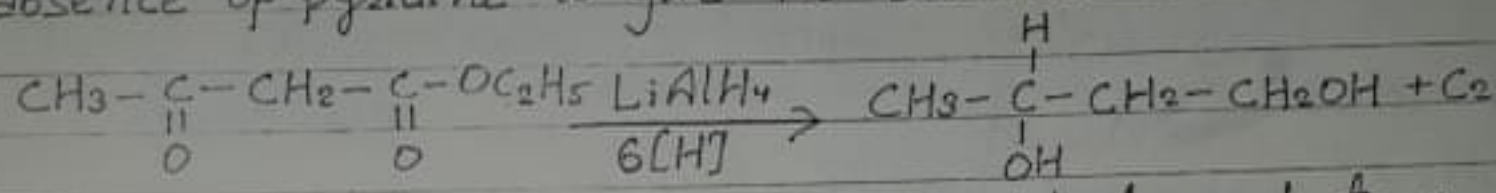
Chemical Properties: * Reaction involving Ketonic form:

1. Reduction:- When acetoacetic ester is reduced in the presence of Na/Hg/C₂H₅OH or LiAlH₄ / Pyridine to give B-hydroxy butyric ester.
or Ni-catalyst



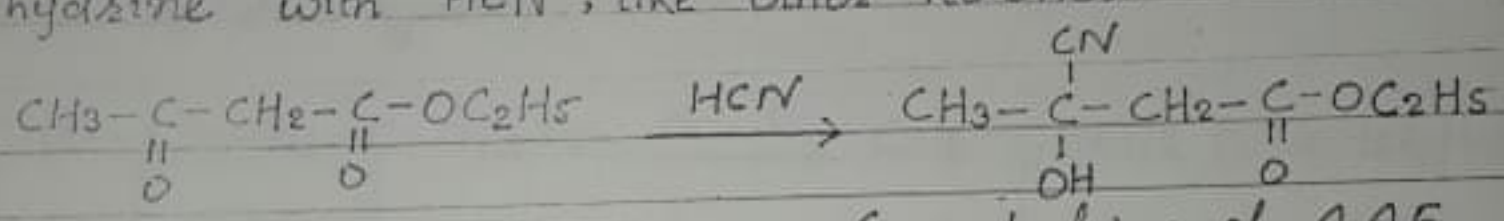
B-hydroxy butyric ester

When acetoacetic ester (A.A.E) reduced with LiAlH₄ in absence of pyridine to give 1,3-butanediol.



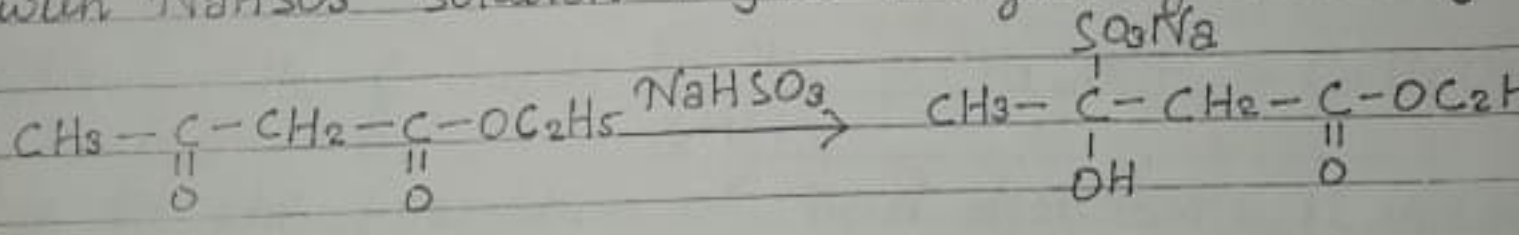
1,3-dihydroxy butane.

2. Reaction with hydrogen cyanide:- A.A.E forms cyanohydrine with HCN, like other ketones.

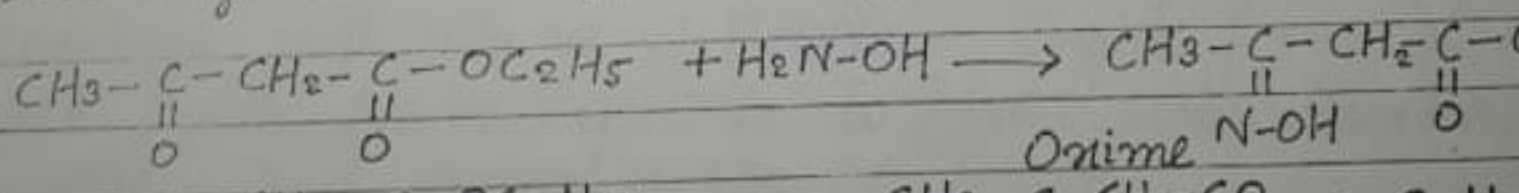


Cyanohydrine of A.A.E

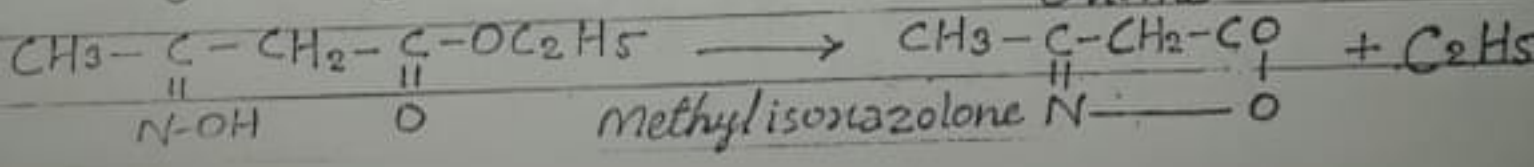
3. Reaction with sodium bisulphite:- When A.A.E react with NaHSO₃ solution to give a crystal of NaSO₃ of A.A.E.



4. Reaction with hydroxylamine:- When A.A.E react with hydroxylamine to give Oxime. Which immediately loses ethyl alcohol to give methyl isoxazolone.

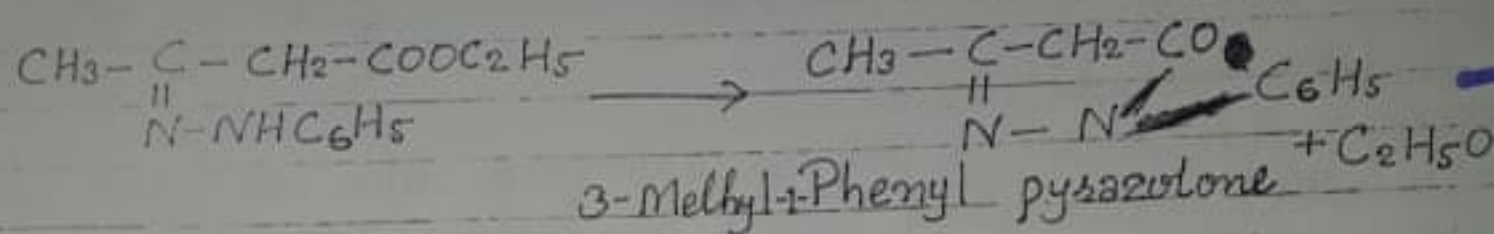
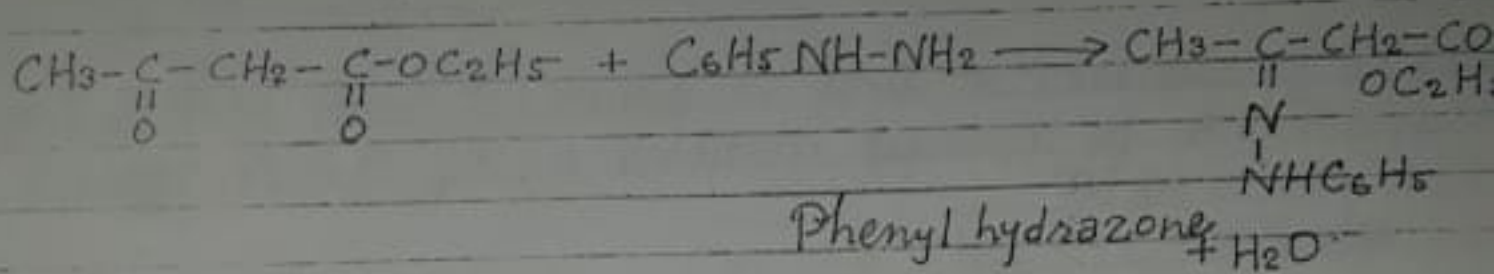


Oxime

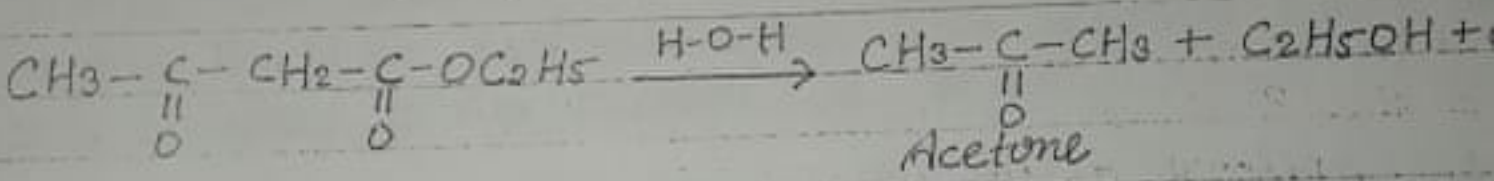


methyl isoxazolone

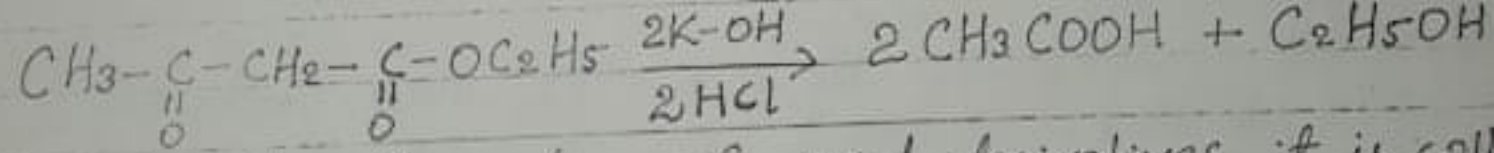
(5) Reaction with Phenyl hydrazine :- When A.A.E. reacts with phenyl hydrazine, it first form phenyl hydrazone then loses of ethylalcohol to give 3-methyl-1-phenyl pyrazolone



(6) Ketonic hydrolysis :- When A.A.E. boiled with aq. or alc. KOH to give acetone or pot. salt of fatty acids. It is called Ketonic hydrolysis.



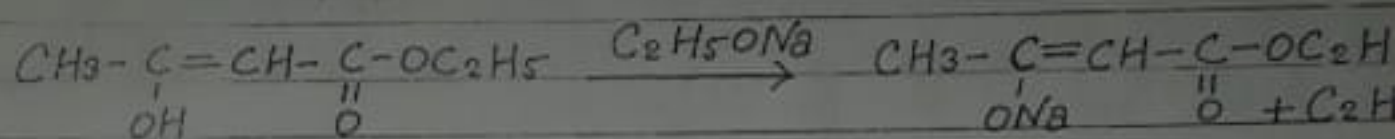
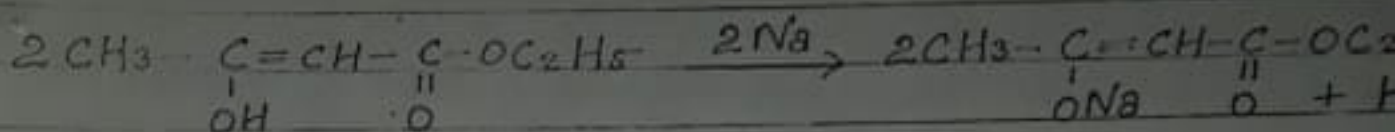
(7) Acid hydrolysis :- When A.A.E. boiled with conc. KOH it is hydrolysed to form acid:



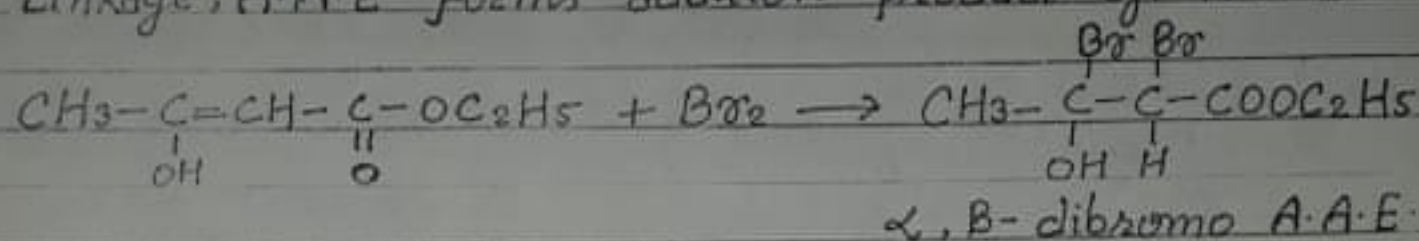
Due to the formation of acid derivatives it is called acid hydrolysis.

* Reaction involving Enolic form

(8) Reaction with Na or C₂H₅ONa :- Enolic form of A reacts with Na or C₂H₅ONa to give sodio derivative of ester and evolved H₂ gas. or C₂H₅OH

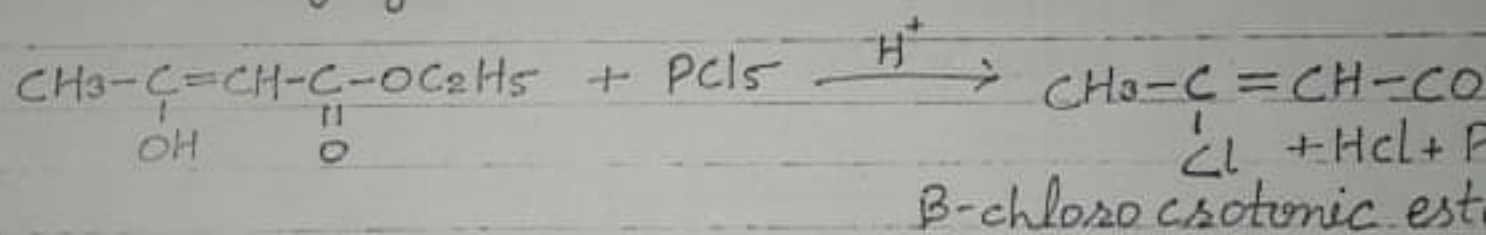


(9) Reaction with Bromine :- Due to presence of Olefinic Linkage, A.A.E forms addition product of A.A.E.

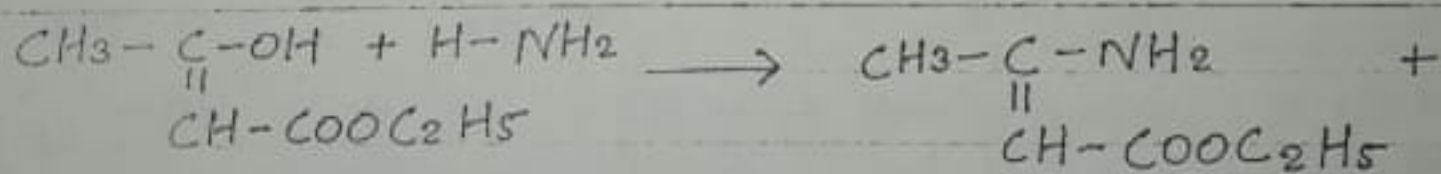


(10) Reaction with Grignard reagent :- When A.A.E. reacts with Grignard reagent to form hydrocarbon (Alkane). The formation of alkane depends upon alkyl group of Grignard reagent.

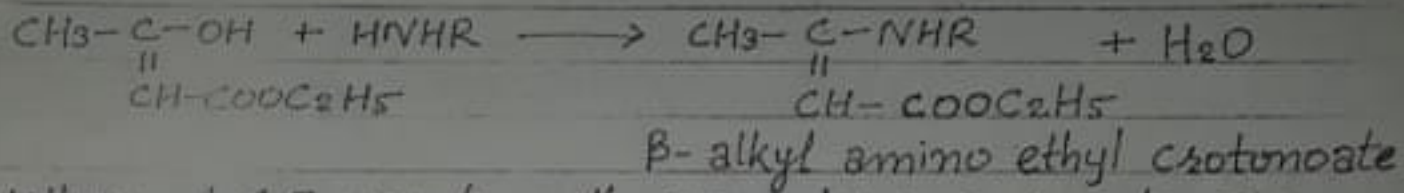
(11) Reaction with PCl5 :- When A.A.E. reacts with PCl5 to give β-chloro crotonic ester. This reaction proves one hydroxy group present in A.A.E.



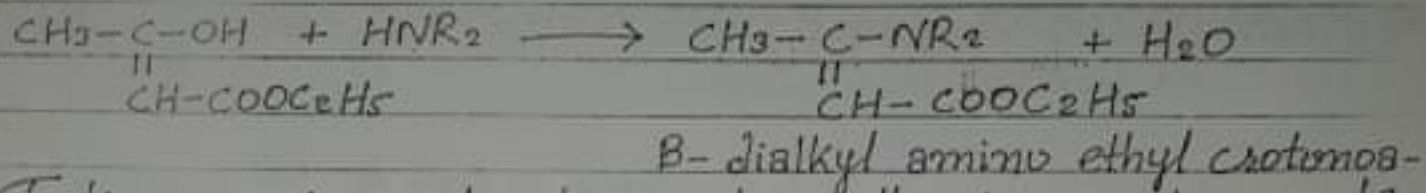
(12) Reaction with NH3 and its derivatives :- When A.A.E. reacts with NH3 to give β-amino crotonic ester.



When A.A.E reacts with primary amine to give β -alkyl amino ethyl crotonate.

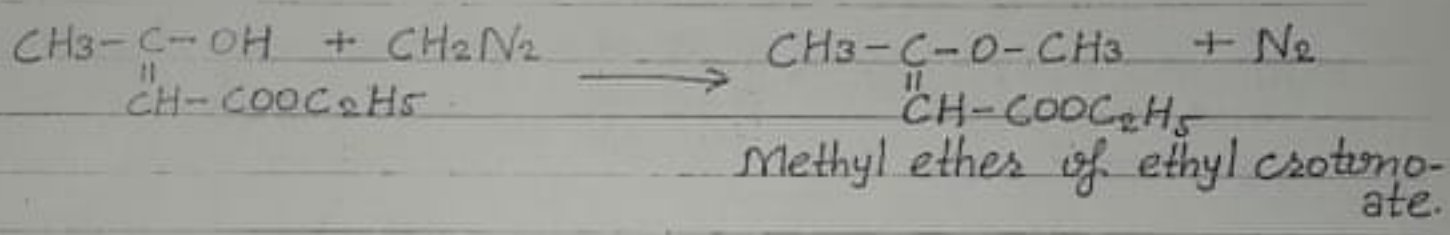


When A.A.E reacts with secondary amine to give β -dialkyl amino ethyl crotonate.



Tertiary amines do not react with A.A.E due to absence of H-atom

(13) Reaction with diazomethane :- When A.A.E reacts with diazomethane to give methyl ether of ethyl crotonate.



(14) Reaction with pyrogallol (1,2,3-trihydroxy Benzene) :- When A.A.E reacts with pyrogallol to give 4-methyl-7,8-dihydroxy coumarin

