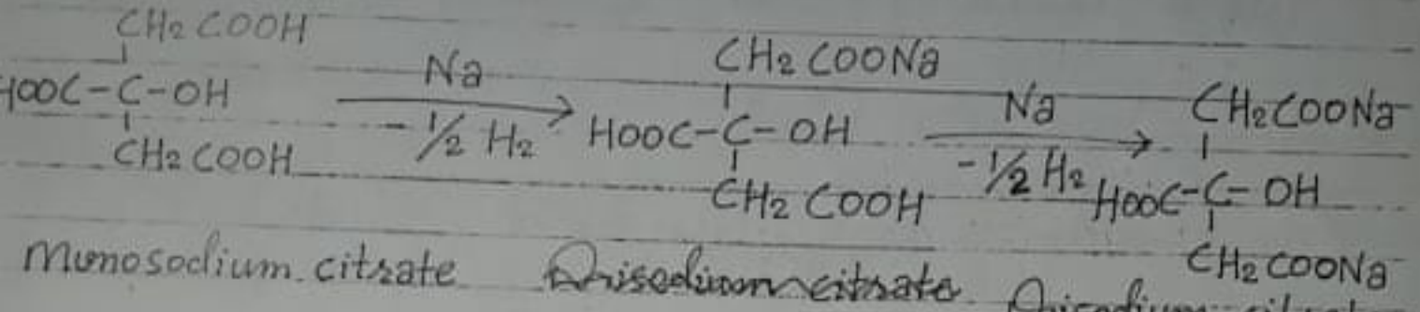
Chemical Properties

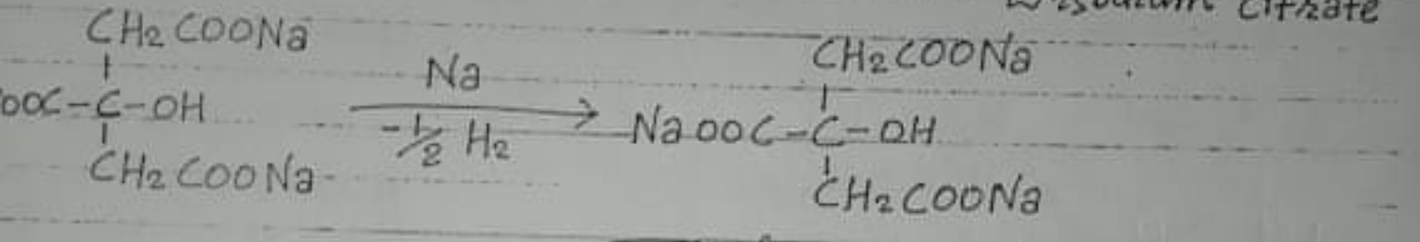
Citric acid behaves as a tribasic acid and alcoholic group also.

Reaction due to Carbonyl group

1. Reaction with metal :- When citric acid reacts with 3-atom of Na one by one to give mono sodium citrate, disodium citrate and trisodium citrate.

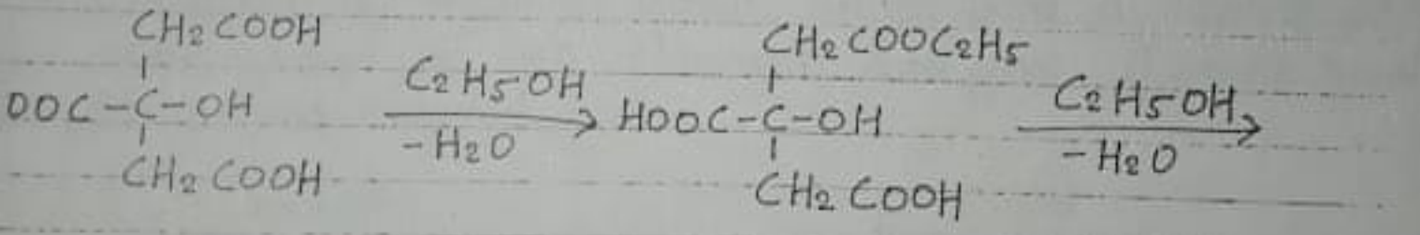


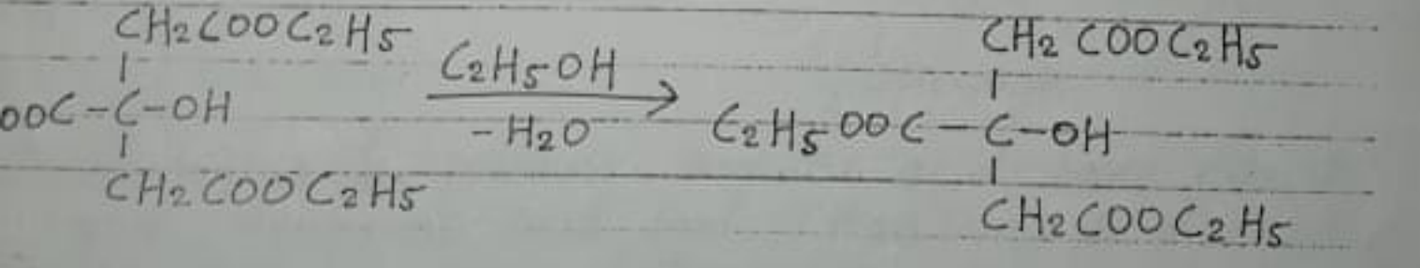
Monosodium citrate ~~Disodium citrate~~ Disodium citrate

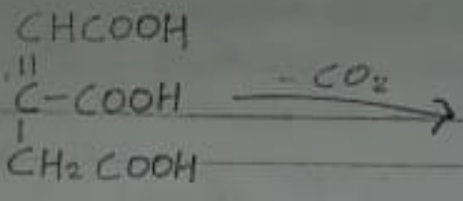


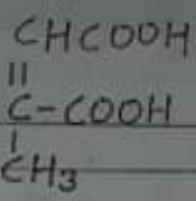
Trisodium citrate

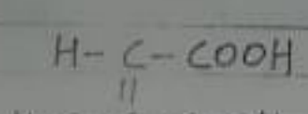
2. Reaction with Alcohol :- When citric acid reacts with alcohol to form three series of esters.

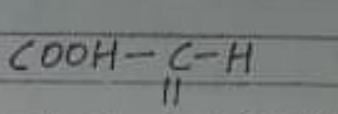








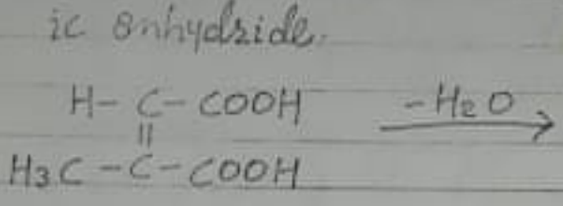




Citraconic acid

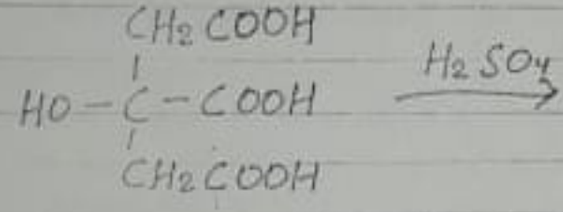
Mesoconic acid

Citraconic acid eliminate H_2O mol. to give Citraconic anhydride.

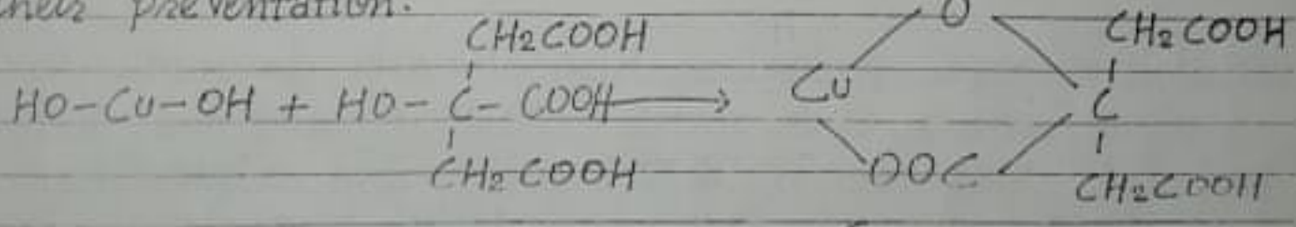


Citraconic anhydride

6. Reaction with H_2SO_4 :- When citric acid reacts with H_2SO_4 to give Acetone dicarboxylic acid because Conc. H_2SO_4 is hygroscopic in nature.



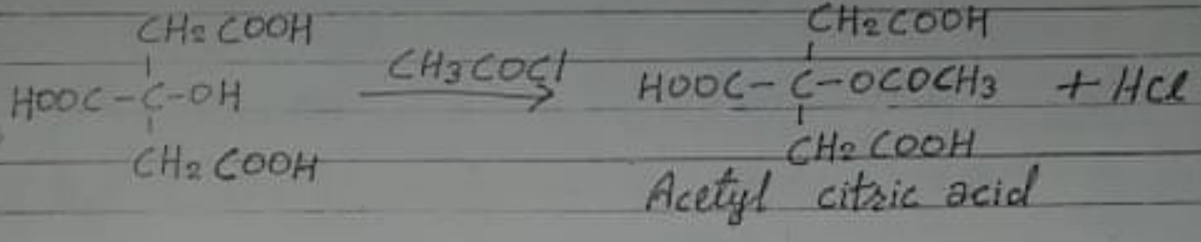
Like tartaric acid it also forms soluble complexes with certain metallic hydroxides and thus prevents their preventation.



Soluble complex

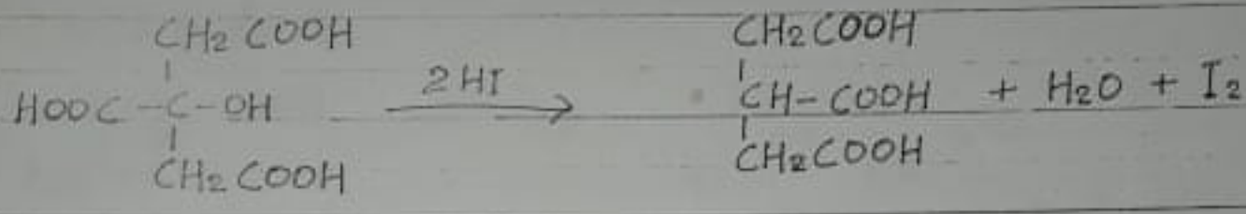
Reaction due to alcoholic group

3. Reaction with Acetyl chloride :- When citric acid reacts with acetyl chloride, the acetyl chloride reacts with alcoholic group and form acetyl citric acid.



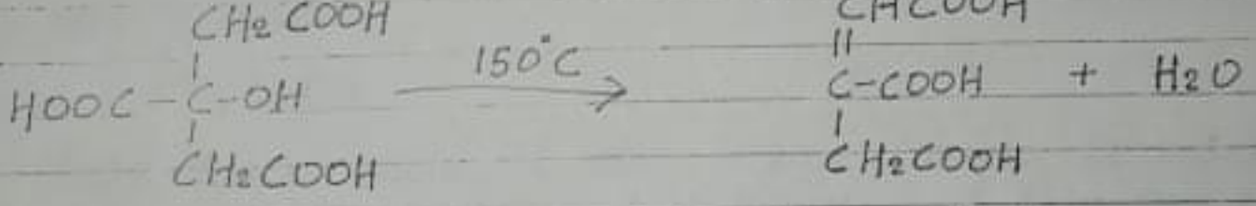
Acetyl citric acid

4. Reduction :- When citric acid is reduced in presence of HI to give ~~tricarboxylic~~ Tricarboxylic acid.



Reaction due to alcoholic and Carboxylic group both

5. Effect of Heat :- When citric acid is heated at 150°C 1 mol. of H_2O eliminate and give Aconitic acid. It is unsaturated acid.



At higher temperature aconitic acid loses CO_2 to give mesaconic acid and Citraconic acid. Both are isomer- Cis and trans form.