

CLASS - B.Sc (Hons) PART - II

PAPER - IV

TOPIC - Properties and uses of citric acid

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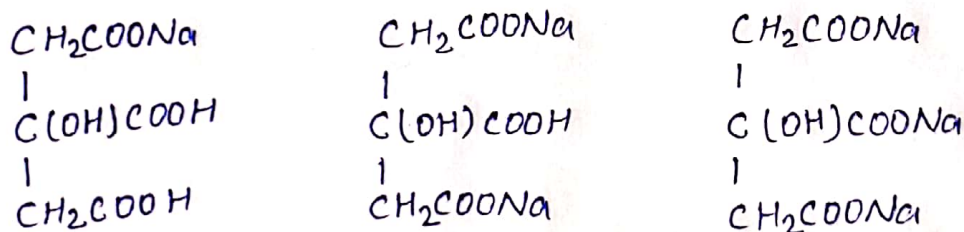
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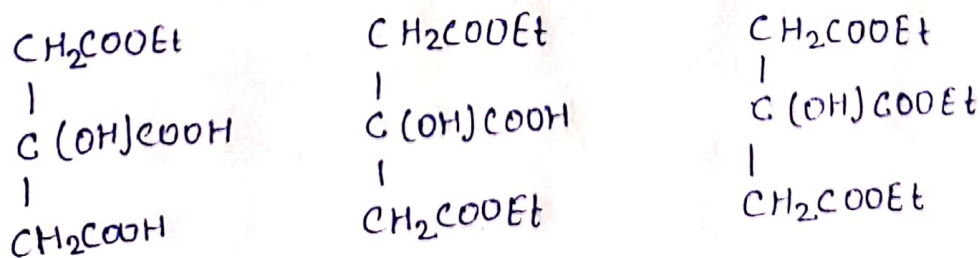
Q Give the properties and uses of citric acid?

Ans. Properties: It is a white crystalline solid containing one molecule of water of crystallisation. It loses its water at 130° and melts at 153°. Readily soluble in water, moderately soluble in alcohol and sparingly in ether. It does not contain any asymmetric C-atom and is not optically active

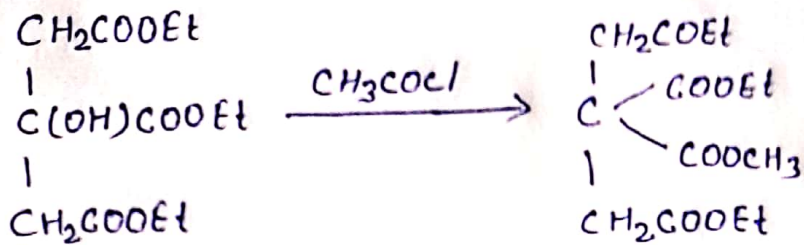
1 As it is a tribasic acid, it forms three series of salts with alkalis and carbonates, three series of esters with alcohol and three series of amides with caustic soda, it can give mono, di and tri sodium acetate.



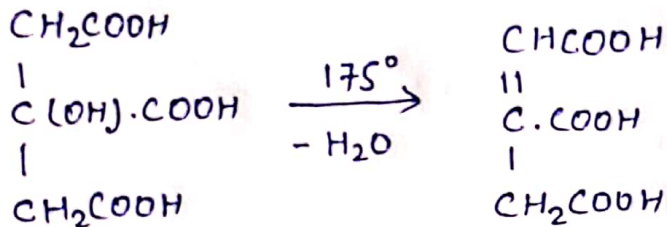
2 with alcohol, it forms three series of ester - mono, di and triethyl ester.



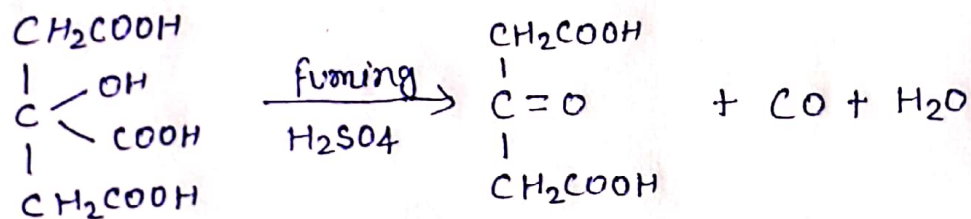
3 When heated with acetic anhydride or acetyl chloride, citric acid or better its triesters give mono acetyl derivative as it contains one -OH group.



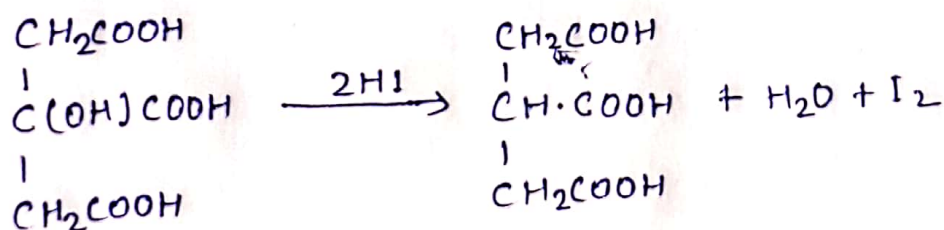
4. When the anhydrous acid is heated to 175° , it loses a molecule of water and forms an unsaturated aconitic acid



5. When citric acid is heated with Conc. H_2SO_4 , aconitic acid is formed but when heated with fuming H_2SO_4 , citric acid is converted into acetone dicarboxylic acid.



6. When reduced by HI, tricarballylic acid is obtained



Like tartaric acid, it also prevents the precipitation of certain metallic hydroxide from their salt solutions. When KOH solution is added to CuSO_4 solution in presence of citric acid, Cu(OH)_2 is not precipitated.

Uses: Used in making lemonades, as a mordant in dyeing and calico printing. Also as medicines, as plasticizers for lacquers and varnishes etc.