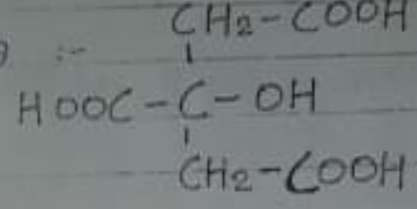
CITRIC ACID

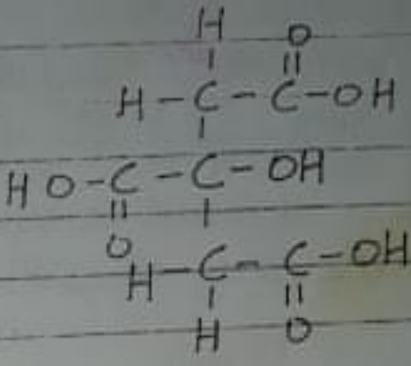
It is also known as 3-carboxy, 3-hydroxy pentane 1,5-dioic acid or 1,2,3-tricarboxy, 2-hydroxy propan

Molecular formula :- $C_6H_8O_7$

Rational formula :-



Structural formula :-

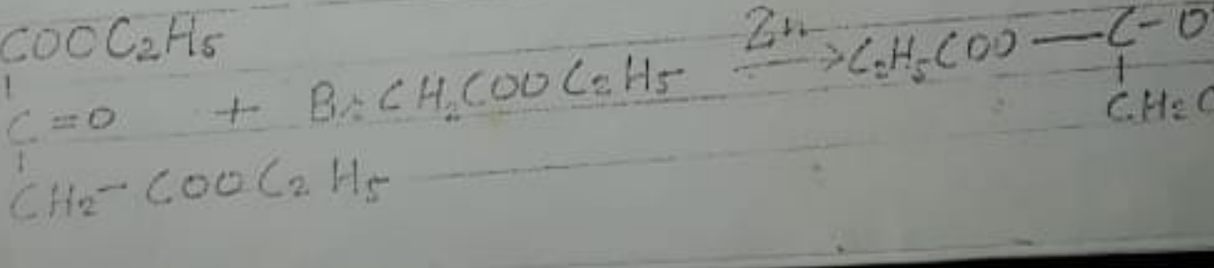


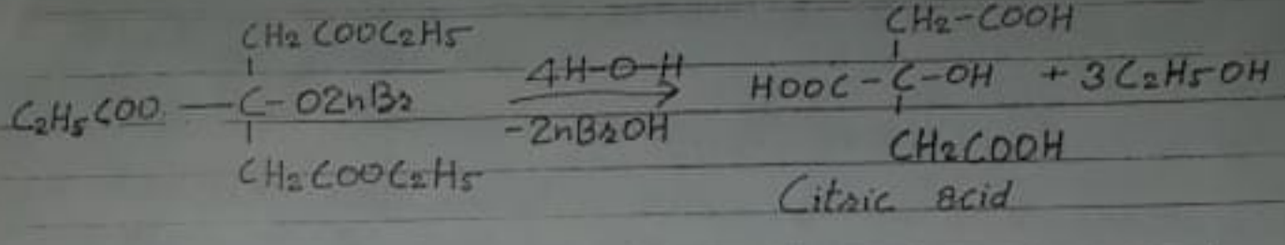
Occurence :- Citric acid generally occurs in unripe fruits of Citrus group.
ex :- Tomato, orange, lemon, galgal, etc.
Lemon juice contains 6-10 % of citric acid.

Methods of Preparation :-

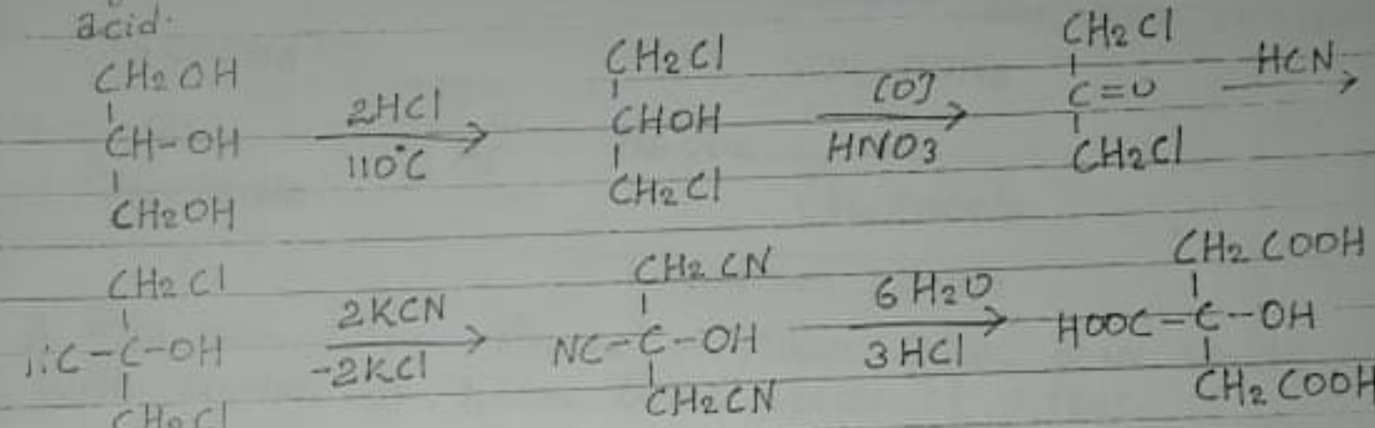
1. From lemon juice :- Lemon juice is first boile coagulate proteins which is filtered off. The fil is neutralised with lime, and boiled. Calcium ci insoluble in boiling water which is removed by f ation method. Calcium citrate reacts with H_2SO_4 give monohydrate crystals of Citric acid.

2. By Reformatsky reaction :- Citric acid is obtai hydrolysing the product which is obtained by sation of ethyl bromoacetate with oxal acetate presence of Zn.





3. From Glycerol :- When glycerol reacts with HCl at 110°C then both the primary alcoholic group change into chloro group. After oxidation, secondary alcohol oxidised to give ketonic group then reacts with HCN to give dichloro derivative which on further reacts with HCN to give 1,2,3-tricyano-2-hydroxy propane which is hydrolysed with H_2O in presence of HCl to give Citric acid.



Physical Properties :

1. Citric acid crystallises in the form of large rhombic crystals containing one molecule of H_2O.
2. Melting point 101°C.
3. Upon heating 130°C it looses water and becomes anhydrous. The mp of anhydrous citric acid is 153°C.
4. It is soluble in water and alcohol but sparingly soluble in ether.