

B. Sc I June 2008:
New syllabus:

UNIT – 5 Carboxylic acids and their derivatives - - - - [7]

5.1 Monocarboxylic acids:

Introduction, Method of formation of halo acids, mono-, di- and trichloroacetic acids. Substitution reactions of monochloroacetic acids by nucleophiles CN^- , OH^- , I^- and NH_3

5.2 Hydroxy acids: Malic acid and citric acid.

Methods of formation of maleic acid from maleic acid, from O – bromo succinic acid and moist Ag_2O . Reactions of malic acid- action of heat, oxidation and reduction with HI . Uses of Malic acid.

Method of formation of citric acid from glycerol.

Reactions of citric acid- acetylation by acetic anhydride, reduction by HI and action of heat at 422K. Uses of citric acid.

5.3 Unsaturated acids: Acrylic acid and Cinnamic acid.

Methods of formation of acrylic acid from acrolin and by dehydration of P – hydroxy Propionic acid. Reactions of acrylic acid – addition of H_2O , reduction by $\text{Na/C}_2\text{H}_5\text{OH}$. Uses of acrylic acid.

Methods of formation of cinnamic acid from benzaldehyde using diethyl malonate and by using acetic anhydride and sodium acetate.

Reactions of cinnamic acid - Bromination and oxidation. Uses of cinnamic acid.

5.4 Dicarboxylic acids: Succinic acid and Phthalic acid.

Methods of formation of succinic acid from ethylene bromide, maleic acid

Reactions of succinic acid:- action of heat, action of NaHCO_3 , $\text{C}_2\text{H}_5\text{OH}$ in presence of acid. Uses of succinic acid.

Methods of formation of Phthalic acid from o-xylene, naphthalene.

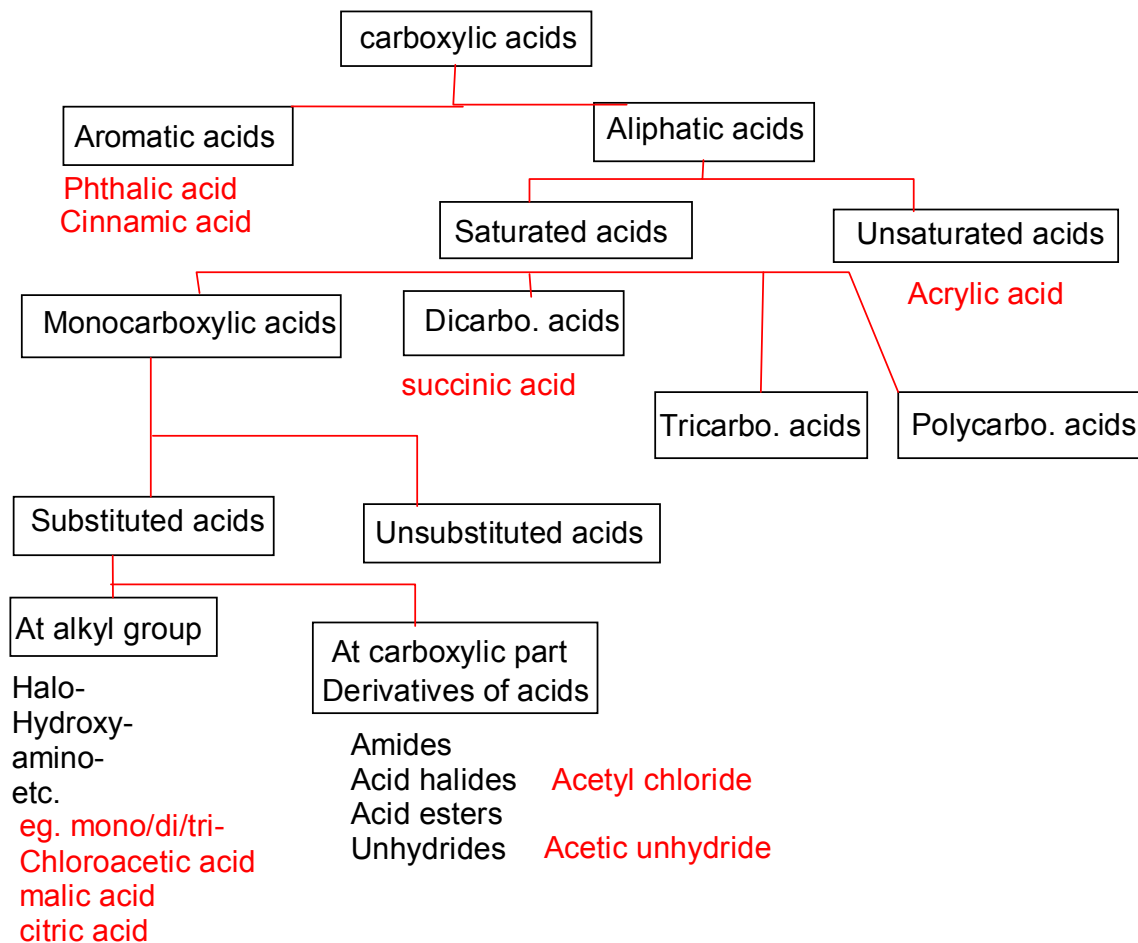
Reaction of phthalic acid- action of heat, reaction with sodalime, NH_3 . Uses of phthalic acid.

5.5 Carboxylic acid derivatives:- Acetyl chloride and Acetic anhydride.

Acid halide derivative:- acetyl chloride: methods of formation from acid by action with PCl_5 and SOCl_2 . Reactions with H_2O , alcohol and NH_3 . Uses of acetyl chloride.

Acid anhydride derivative:- Acetic anhydride: Method of formation by dehydration of acetic acid. Reactions with H_2O , alcohol and NH_3 . Uses of acetic anhydride.

1. Introduction: Classification of acids



Classification of ACIDS

2. Chemistry of : mono, di and tri chloroacetic acid

Hydroxy acids: Malic acid and citric acid.

Unsaturated acids: Acrylic acid and Cinnamic acid

Dicarboxylic acids: Succinic acid and Phthalic acid

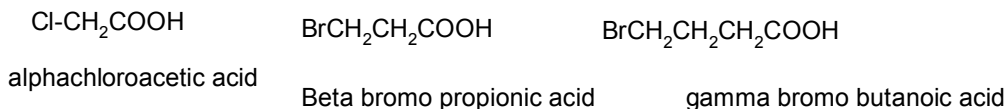
Carboxylic acid derivatives:- Acetyl chloride and Acetic anhydride

Mono carboxylic acids

These are having only one -COOH group.

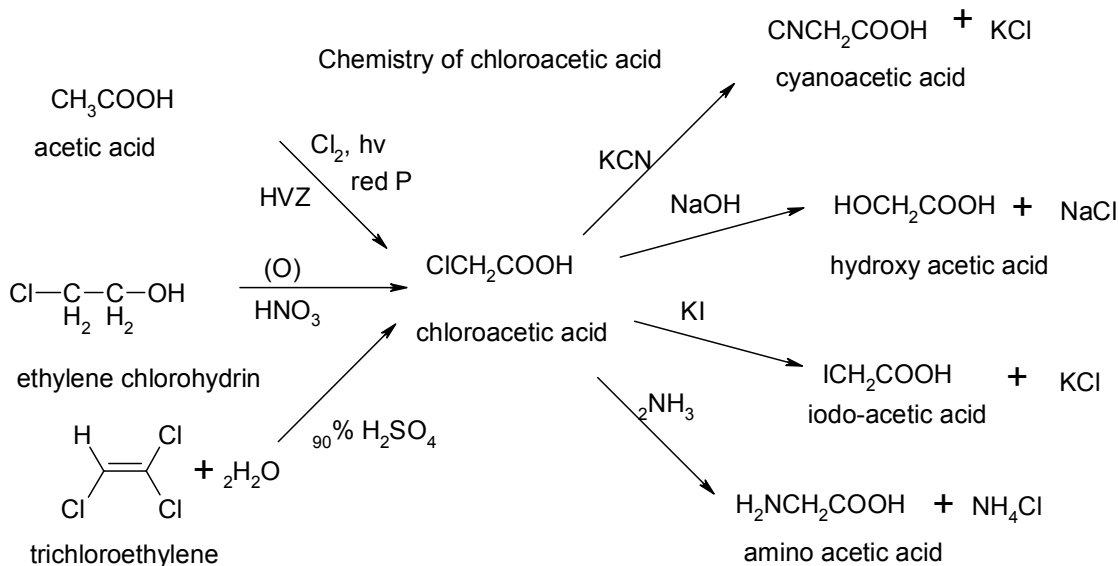
Haloacids are halogenated derivatives of monocarboxylic acids where one H is replaced by halogen. eg. chloroacetic acid.

The haloacids are further divided into alpha, beta, gamma halo-acids, depending on the position of the halogen.

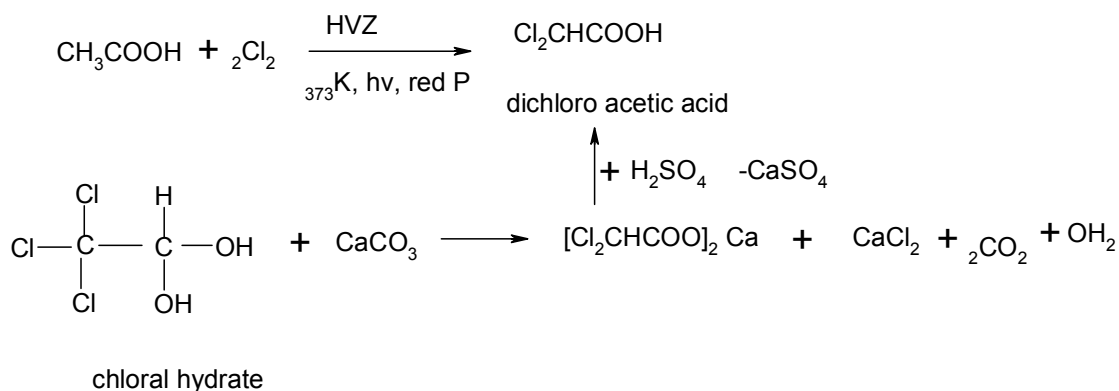


Also the halo-acids are classified as mono- di- tri- halo acids depending on the number of halogen atoms.

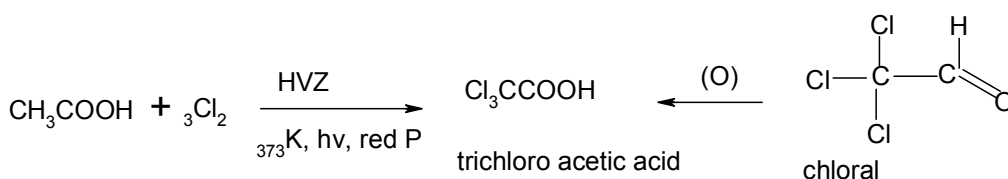
Chemistry of monochloroacetic acid



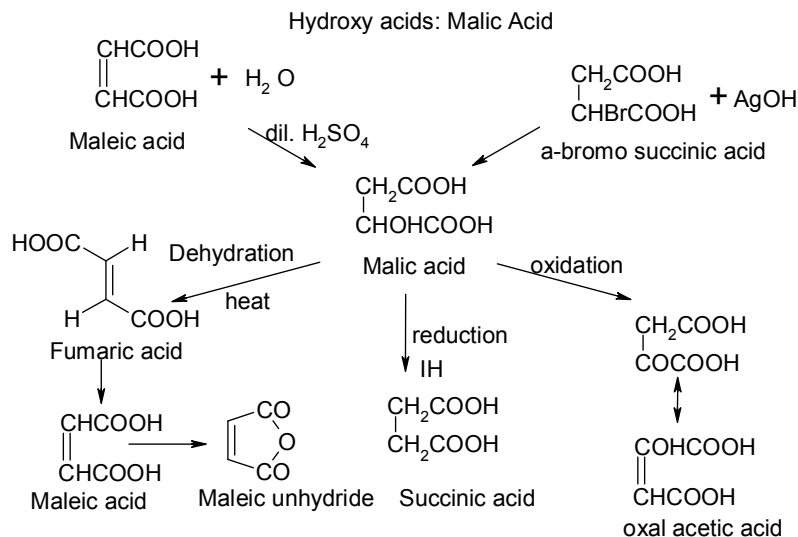
Dichloroacetic acid:



Trichloro acetic acid



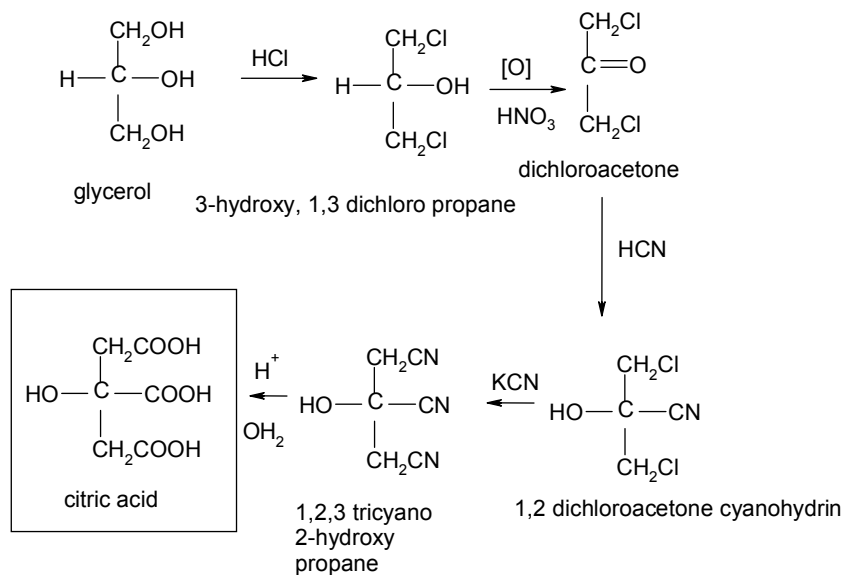
Hydroxy Acids : 1. Malic Acid



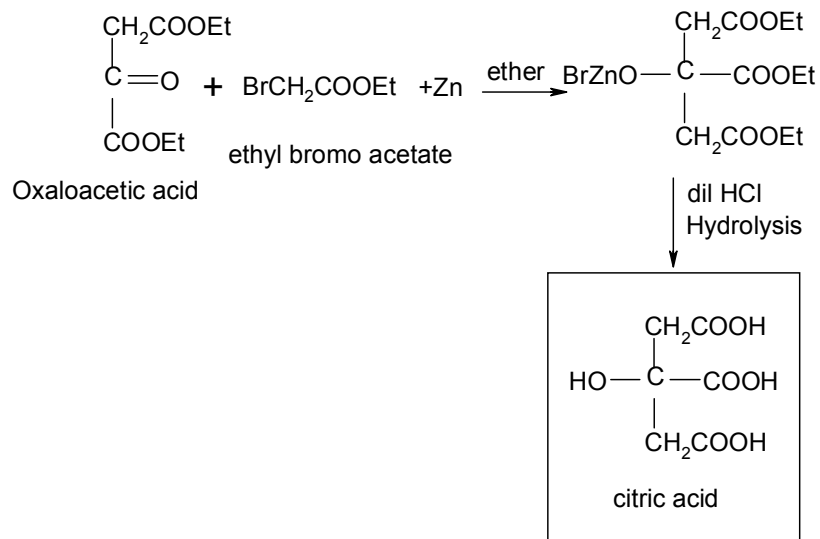
Hydroxy Acid : 2. Citric Acid

Citric acid: 3-carboxy,3-hydroxy ,pentan-1,5-dioic acid

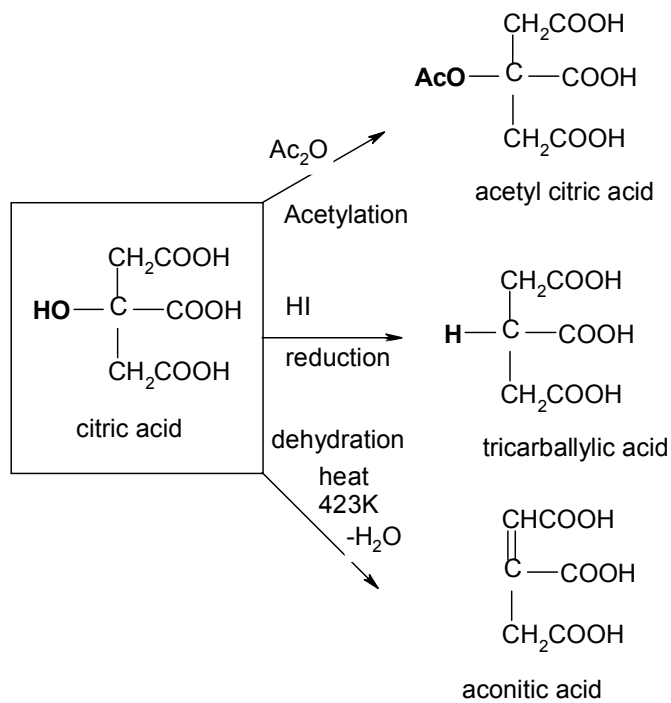
1. Preparation from Glycerol:



2. By Reformatsky reaction:

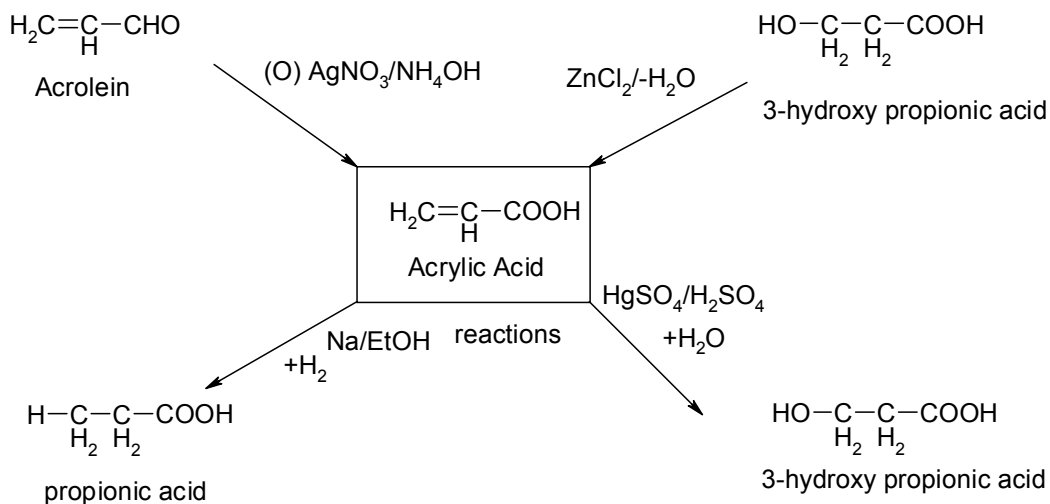


B] Reactions of Citric acid:



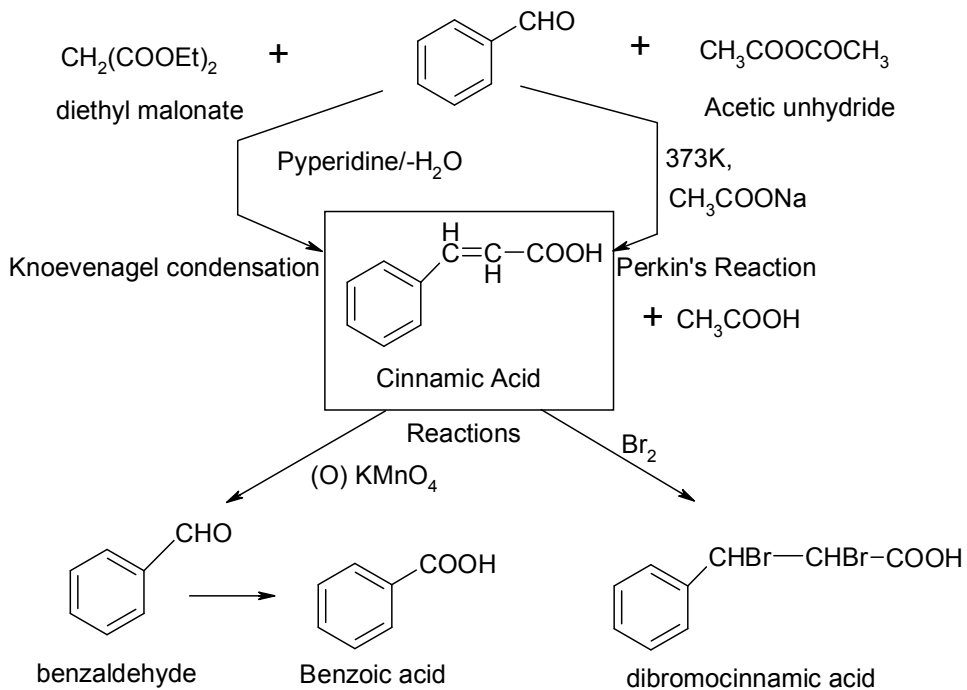
Unsaturated acid: 1. Acrylic Acid

Unsaturated acids: Acrylic acid
methods of preparation

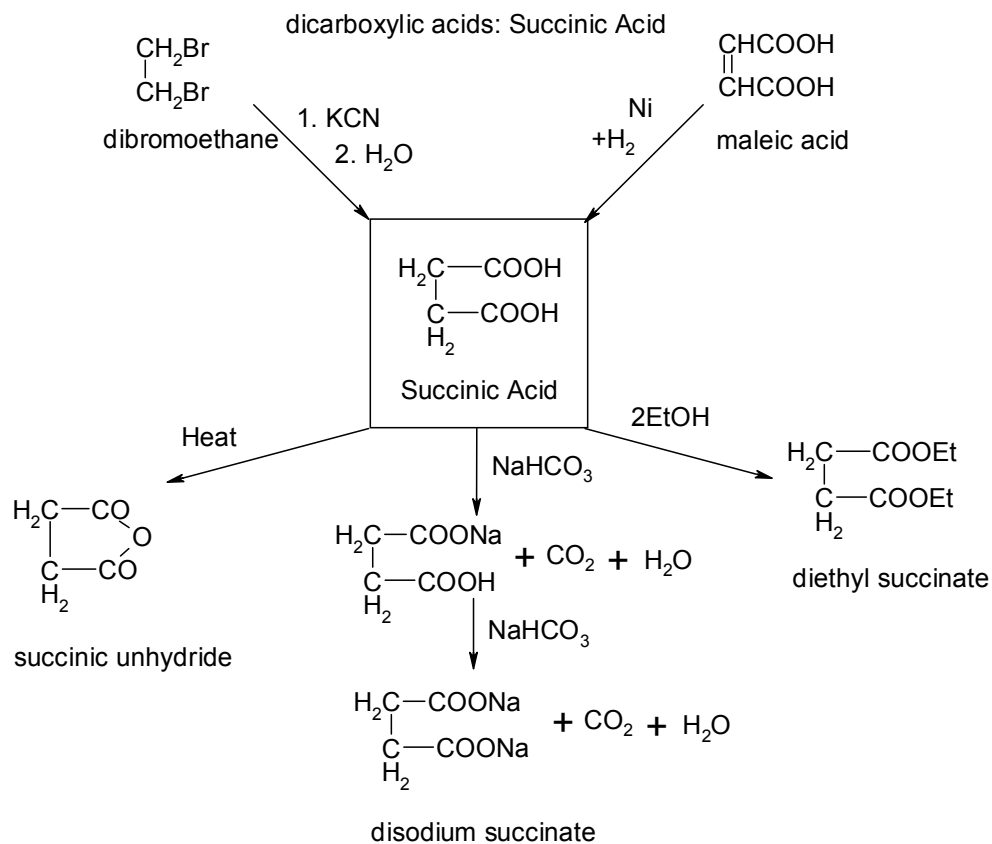


Unsaturated acids: Cinnamic acid

Unsaturated acid: 2. Cinnamic Acid

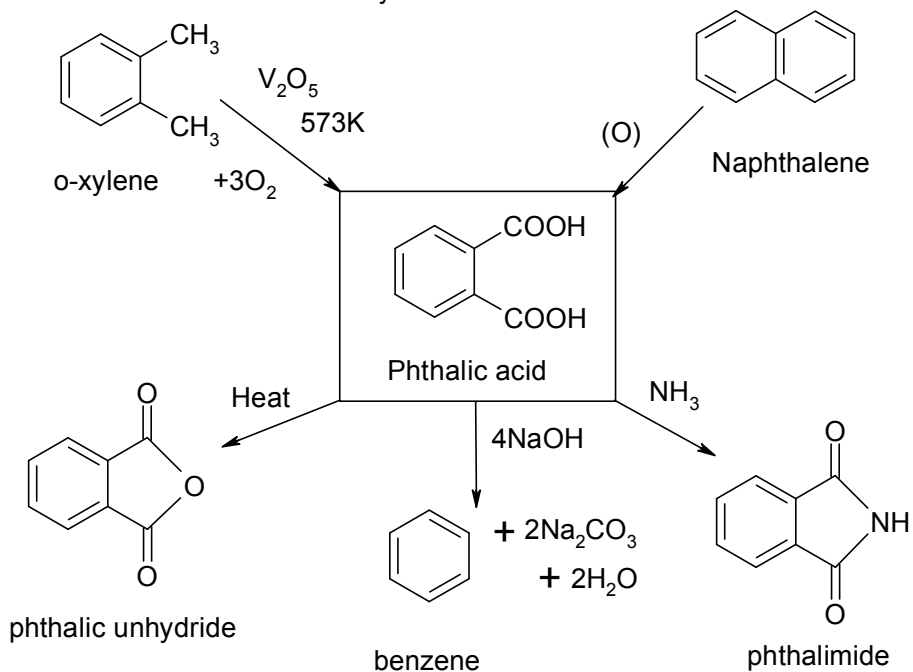


Dicarboxylic Acid: 1. Succinic Acid



Dicarboxylic Acid: 2. Phthalic Acid

dicarboxylic acids: Phthalic Acid



Acid Derivatives:

