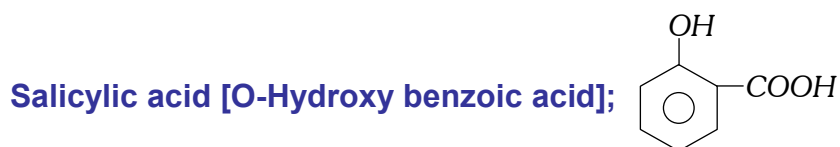


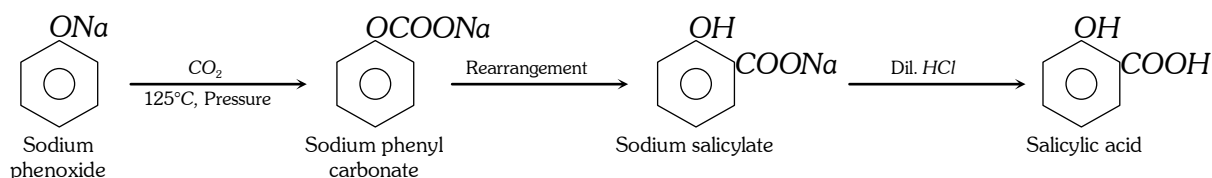
Carboxylic Acids and their derivatives Part 3



Salicylic acid is present in many essential oils in the form of esters. Oil of winter green is a methyl ester of salicylic acid.

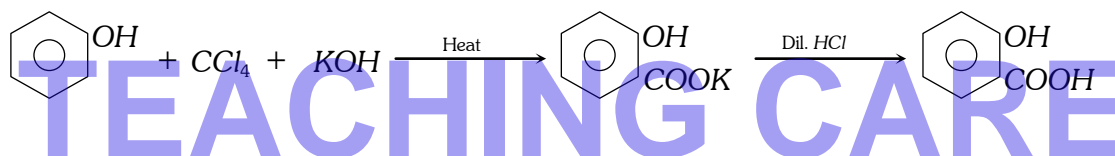
(1) Methods of preparation

(i) Kolbe Schmidt reaction

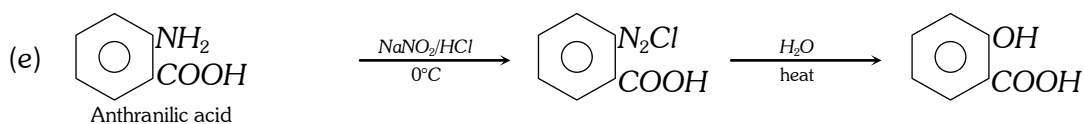
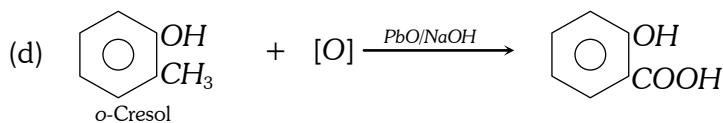
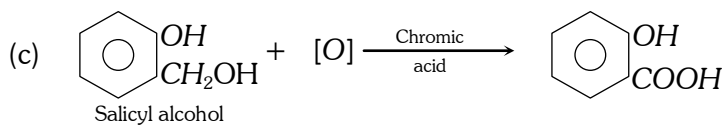
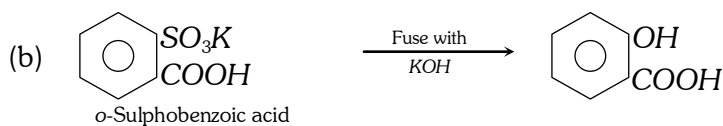
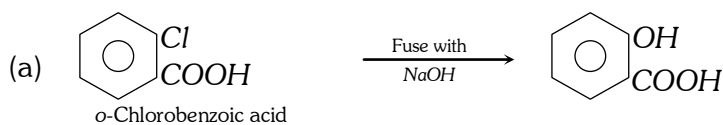


It is a commercial method. The reaction yields both *o*- and *p*- isomers. Salicylic acid is more volatile and separated by steam distillation.

(ii) Reimer-Tiemann reaction



(iii) From benzene derivatives



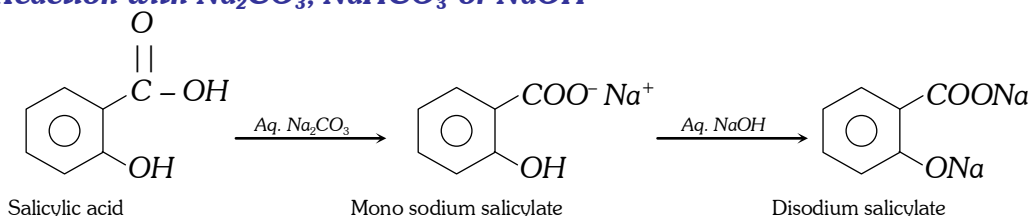
Carboxylic Acids and their derivatives Part 3

(2) Physical properties

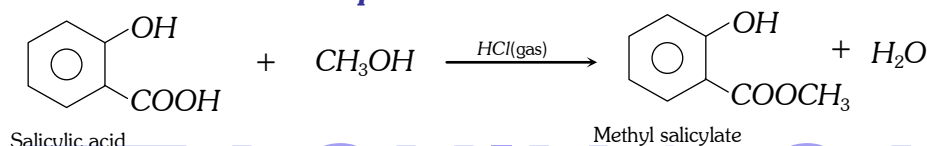
- It is a colourless needle shaped crystalline compound.
- Its *m.p.* is 156°C .
- It is sparingly soluble in cold water but readily soluble in hot water, alcohol, ether and chloroform.
- It is steam volatile.
- It is poisonous in nature. However, its derivative used in medicine internally and externally as antipyretic and antiseptic.

(3) Chemical properties

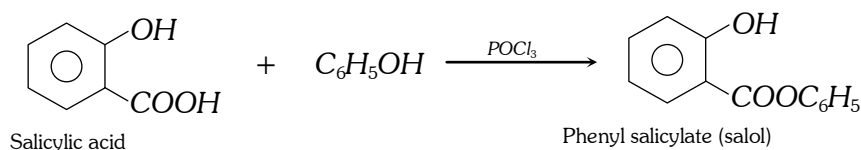
(i) Reaction with Na_2CO_3 , NaHCO_3 or NaOH



(ii) Reaction with alcohols or phenols

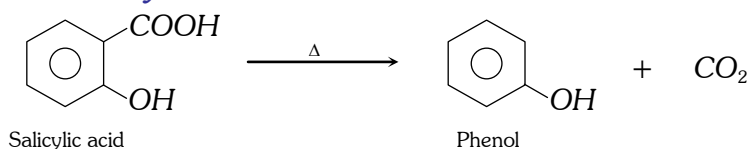


Methyl salicylate is an oily liquid (*oil of winter green*) with pleasant material. It is also used in medicine in the treatment of rheumatic pain and as a remedy for aches, sprains and bruises. It is used in perfumery and as a flavouring. It is used for making of iodex.

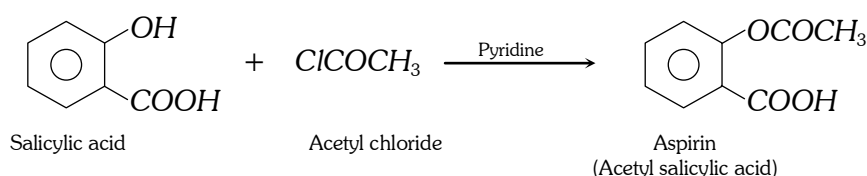


Salol is a white solid *m.pt.* 43°C . It is a good internal antiseptic. It is used in making of toothpastes. Salol absorbs ultraviolet light and its main use now is sun-screening agent and stabiliser of plastics.

(iii) Decarboxylation



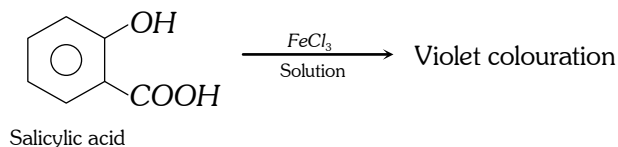
(iv) Acetylation



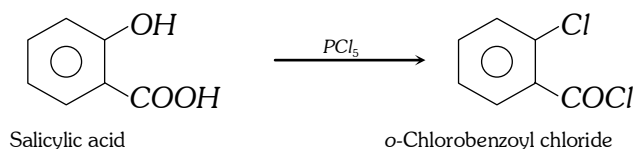
Note : * Aspirin is a white solid, melting point 135°C . It is used as antipyretic and pain killer (analgesic action).

Carboxylic Acids and their derivatives Part 3

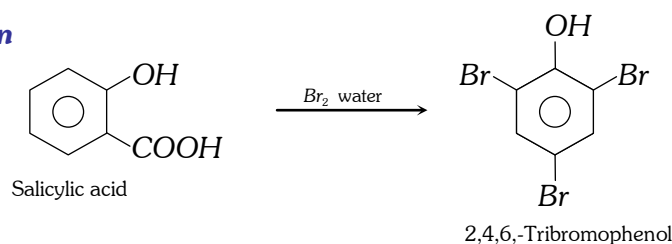
(v) Reaction with ferric chloride solution



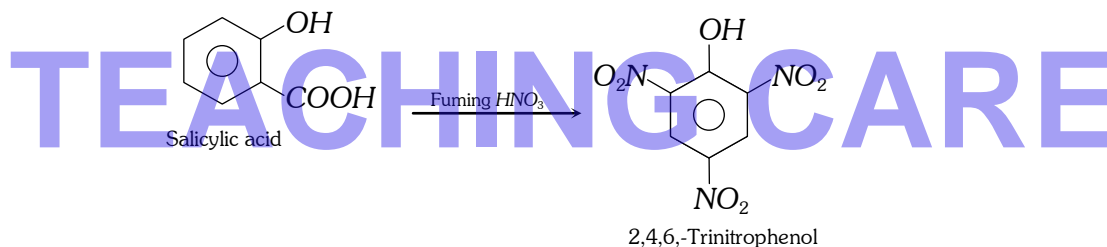
(vi) Reaction with PCl_5



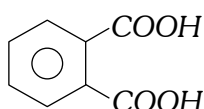
(vii) Bromination



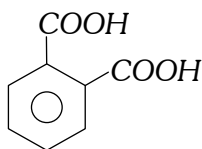
(viii) Nitration



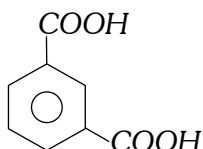
Phthalic acid [1,2,-Benzene dicarboxylic acid]



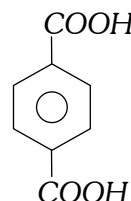
There are three isomer (ortho, meta, para) of benzene dicarboxylic acid.



Benzene-1,2-dicarboxylic acid
(Phthalic acid)



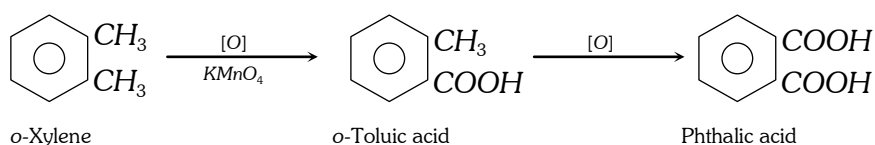
Benzene-1,3-dicarboxylic acid
(Isophthalic acid)



Benzene-1,4-dicarboxylic acid
(Terephthalic acid)

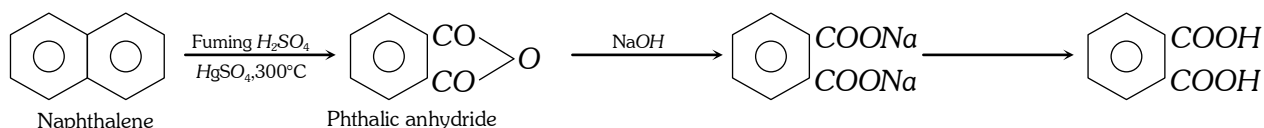
(1) Methods of preparation

(i) By the oxidation of o-xylene :



(ii) From naphthalene (Industrial method) : It is known as aerial oxidation.

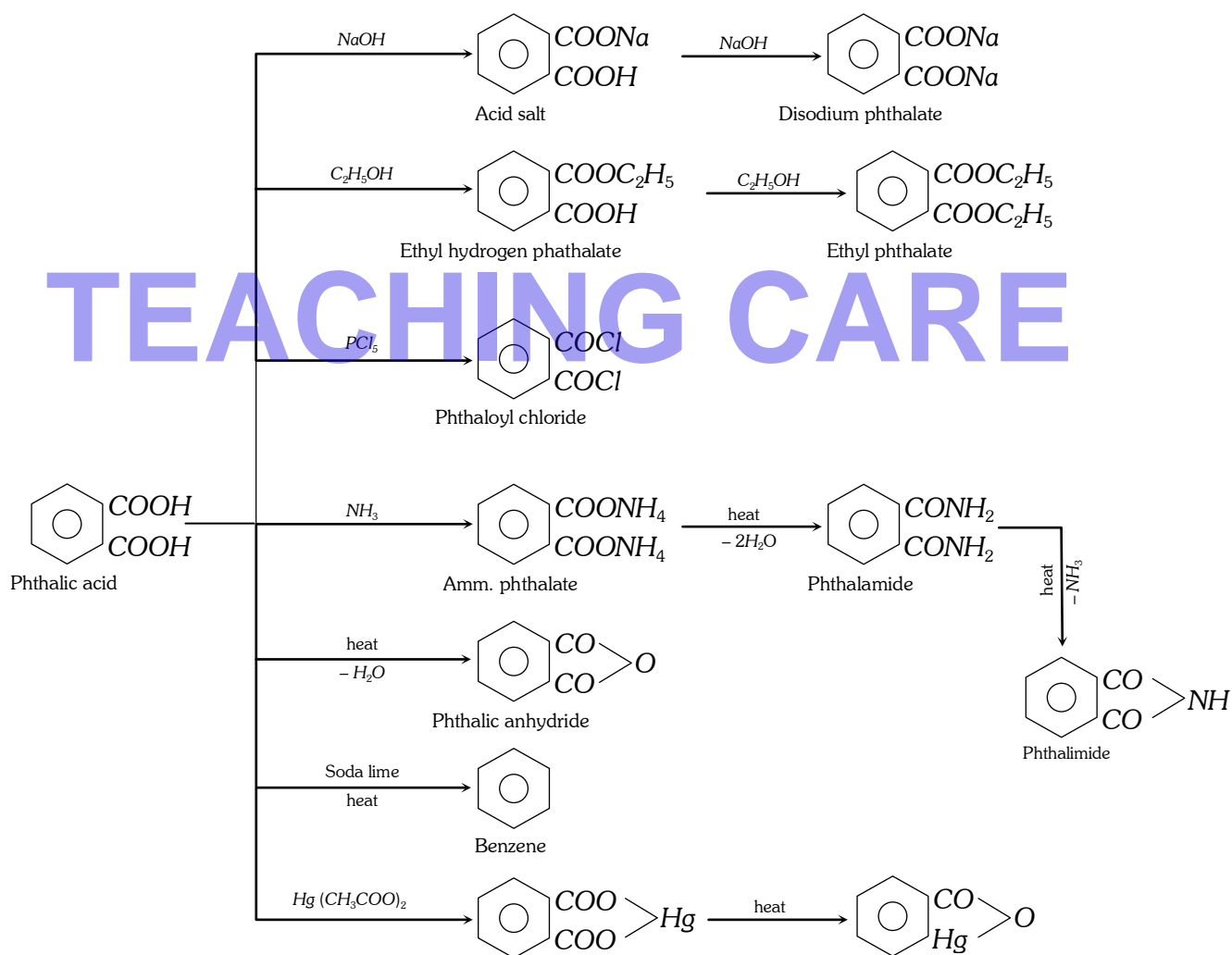
Carboxylic Acids and their derivatives Part 3



(2) Physical properties

- (i) It is colourless crystalline compound.
- (ii) Its melting point is not sharp (195–213°C).
- (iii) It is sparingly soluble in cold water but soluble in hot water, alcohol, ether, benzene etc.

(3) Chemical properties



(4) Uses : It is used in the manufacture of plastics, dyes and other compounds such as phthalic anhydride, phthalimide, anthraquinone and fluorescein etc.