

# CHEMISTRY STUDY MATERIALS FOR CLASS 12

## (NCERT Based Notes of Chapter - 11)

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DATE:- 10/11/2020

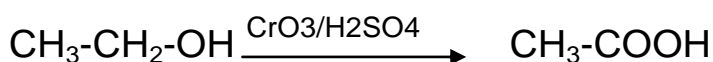
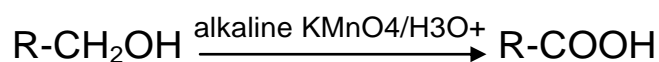
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### Aldehyde, Ketones and Carboxylic Acid

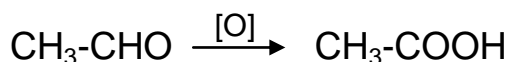
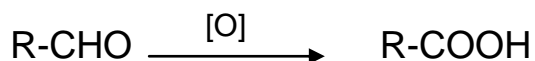
#### Methods of Preparation of Carboxylic acids

##### 1. From primary alcohols and aldehydes:

Primary alcohols are readily oxidised to carboxylic acids with common oxidising agents such as potassium permanganate ( $\text{KMnO}_4$ ) in neutral, acidic or alkaline media or by potassium dichromate ( $\text{K}_2\text{Cr}_2\text{O}_7$ ) and chromium trioxide ( $\text{CrO}_3$ ) in acidic media.

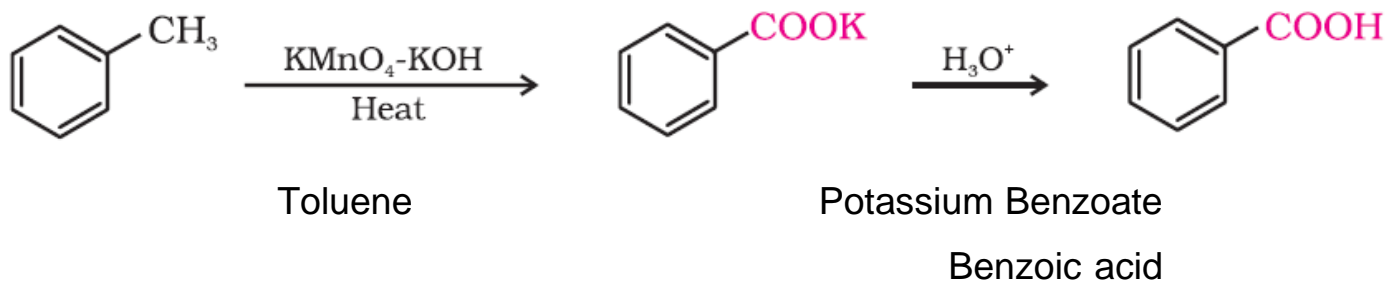


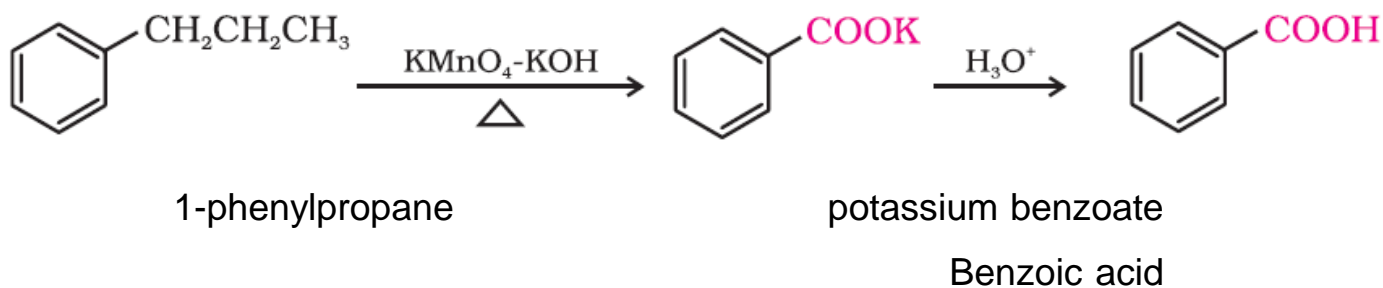
Aldehydes on oxidation with mild oxidising agents like  $\text{CrO}_3$  or Tollen's reagent to give carboxylic acids.



##### 2. From alkyl benzenes:

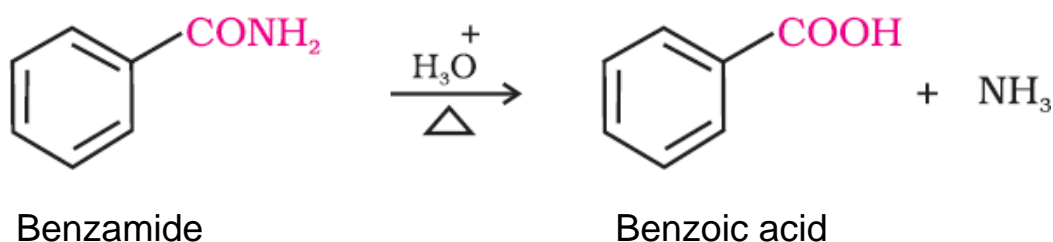
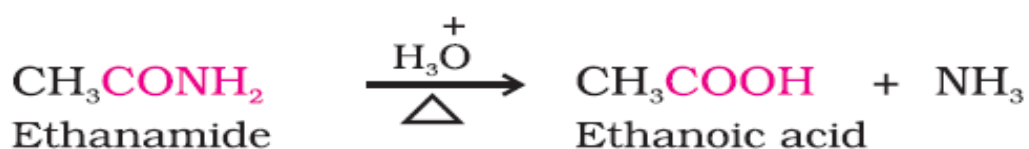
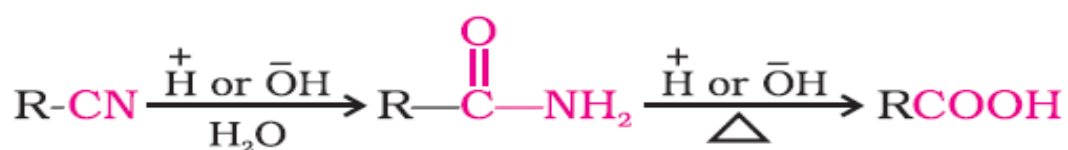
Aromatic carboxylic acids can be prepared by vigorous oxidation of alkyl benzenes with chromic acid or acidic or alkaline potassium permanganate. The entire side chain is oxidised to the carboxyl group irrespective of length of the side chain. Primary and secondary alkyl groups are oxidised in this manner while tertiary group is not affected.





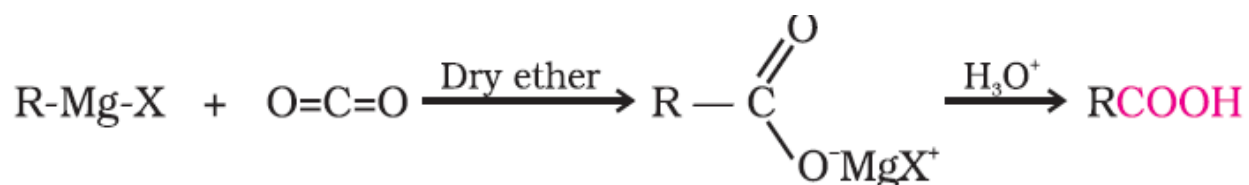
### 3. From nitriles and amides:

Hydrolysis of nitriles in presence of acid or alkali as catalyst first give amides, which on further give carboxylic acids. Mild reaction conditions are used to stop the reaction at the amide stage.



From Grignard reagents:

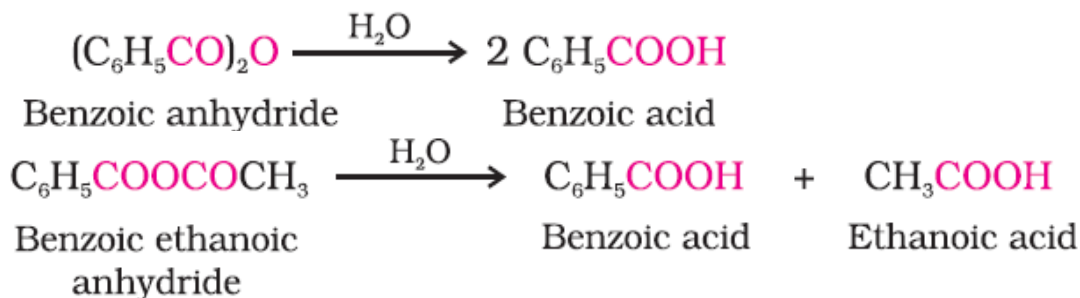
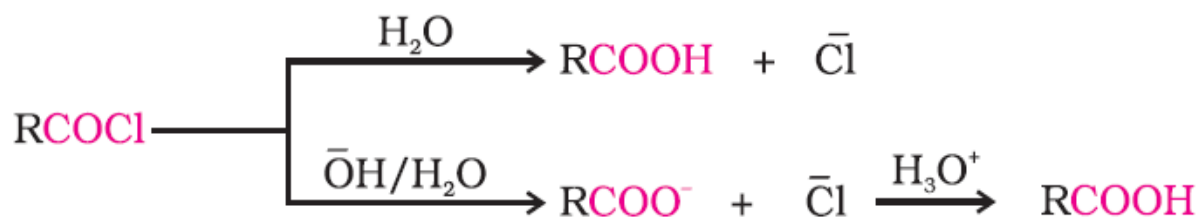
Grignard reagents react with carbon dioxide (dry ice) in dry ether to form salts of carboxylic acids which on acidification give corresponding carboxylic acids.



Grignard reagents and nitriles can be prepared from alkyl halides. So the above two reactions are used for converting alkyl halides into corresponding carboxylic acids having one carbon atom more than that present in alkyl halides.

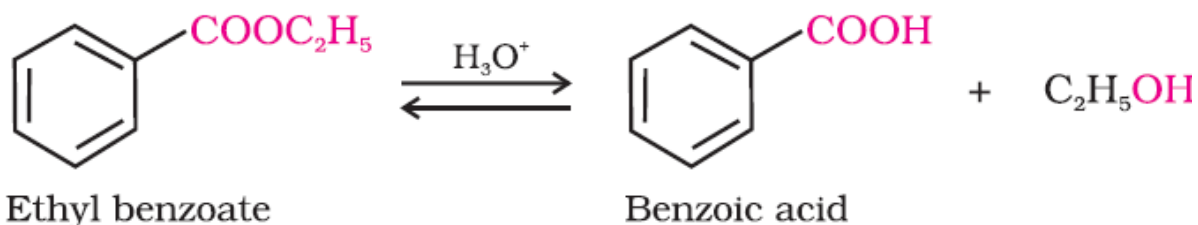
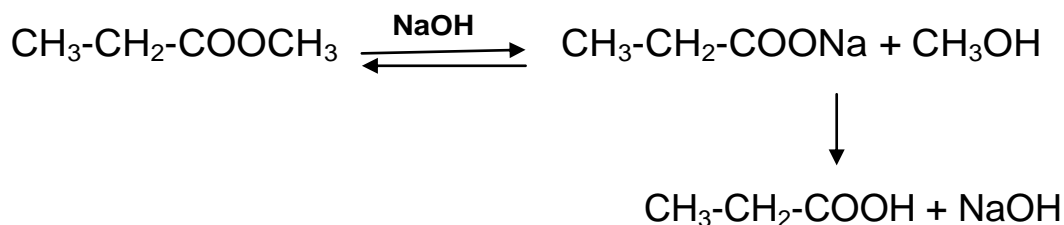
#### 4. From acyl halides and anhydrides:

Acid chlorides and anhydrides when hydrolysed with water give carboxylic acids. The rate of hydrolysis increases in alkaline medium.



#### 5. From esters:

Acidic hydrolysis of esters gives directly carboxylic acids while basic hydrolysis gives salt of carboxylic acids which on acidification give corresponding carboxylic acids.



#### Physical Properties

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