

DADMUS TOLUWANI AMINATI 19/11/2016 MBBS

- i.  $\text{HCOOH}$  - Methanoic Acid
- ii.  $\text{HOOCCH}_2\text{CH}_2\text{CH}_2\text{COOH}$  - Pentan-1,5-dioic acid.
- iii.  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$  - Butanoic Acid
- iv.  $\text{HO}_2\text{C}-\text{CO}_2\text{H}$  - Ethanedioic Acid
- v.  $\text{CH}_3(\text{CH}_2)_4\text{COOH}$  - Hexanoic Acid
- vi.  $\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_2\text{COOH}$  - Hex-4-eneoic acid

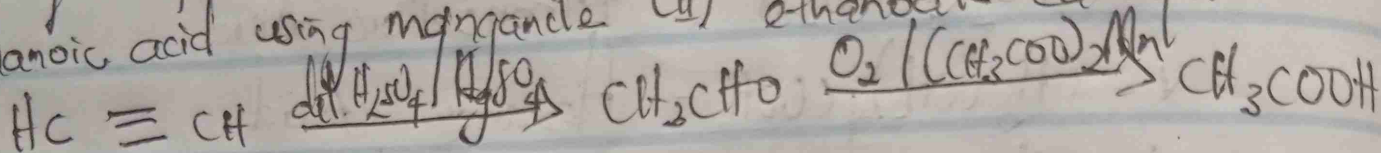
2: Physical Appearance:- All simple aliphatic carboxylic acids up to  $\text{C}_{10}$  are liquid at room temperature. Other carboxylic acids are solid at room temperature.

i. Boiling point:- Boiling point increases with increasing relative molecular mass.

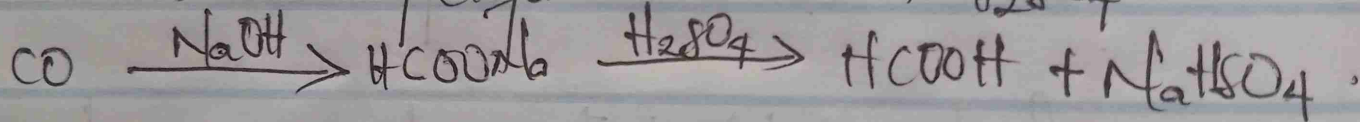
ii. Solubility:- Lower molecular mass carboxylic acids with up to 4 carbon atoms in their molecules are soluble in water. This is due to their ability to form hydrogen bonds with water molecules. All carboxylic acids are soluble in organic solvents.

3 Industrial preparations of carboxylic acids include:-

I from Ethanol:- Ethanoic acid is obtained commercially by the liquid phase air-oxidation of 5% solution of ethanol to ethanoic acid using manganate (II) ethanoate catalyst.

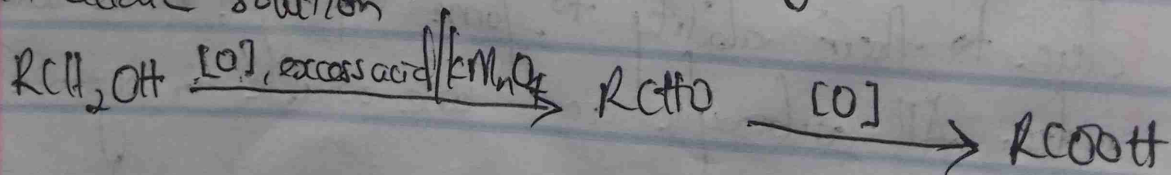


II from Carbon (II) oxide:- Methanoic acid [formic acid] is manufactured by adding carbon (II) oxide under pressure to hot aqueous solution of sodium hydroxide. The free carboxylic acid is liberated by careful reaction with  $\text{H}_2\text{SO}_4$ .

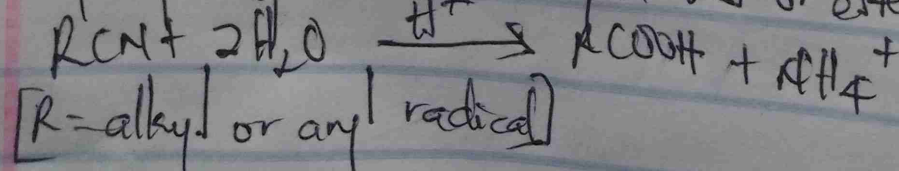


4 Synthetic preparation of carboxylic acids:-

1 Oxidation of primary alcohols and aldehyde:- Oxidation of primary alcohols and aldehydes can be used to prepare carboxylic acids using the usual oxidizing agents (i.e.  $\text{K}_2\text{Cr}_2\text{O}_7$  or  $\text{KMnO}_4$ ) in acidic solution.

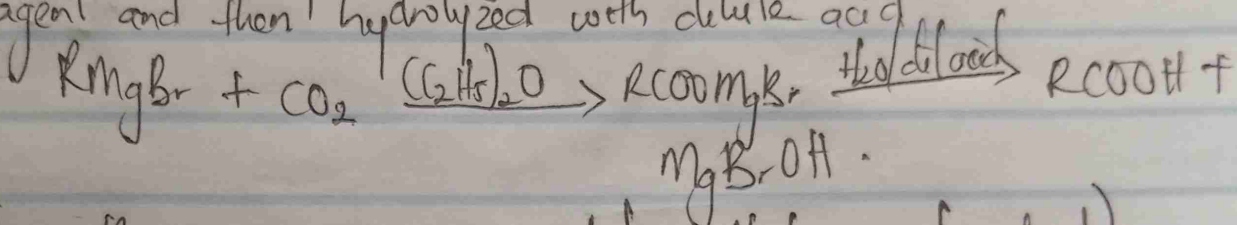


2 Hydrolysis of nitriles [cyanides] or esters:-



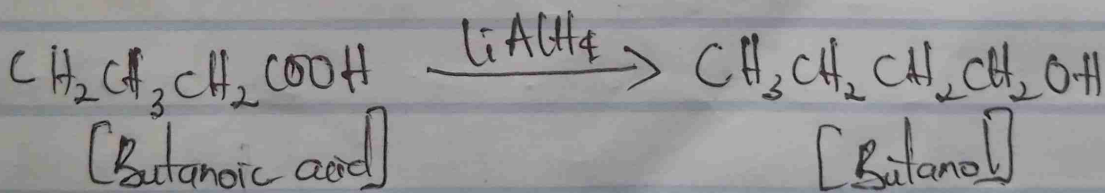
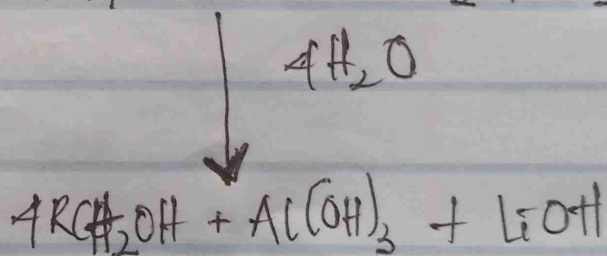
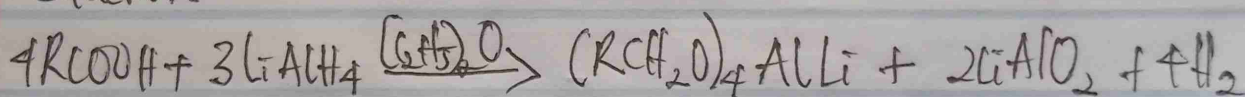


3 Carbonation of Grignard Reagent :- Aliphatic carboxylic acids are obtained by bubbling carbon (iv) oxide into the Grignard reagent and then hydrolyzed with dilute acid.

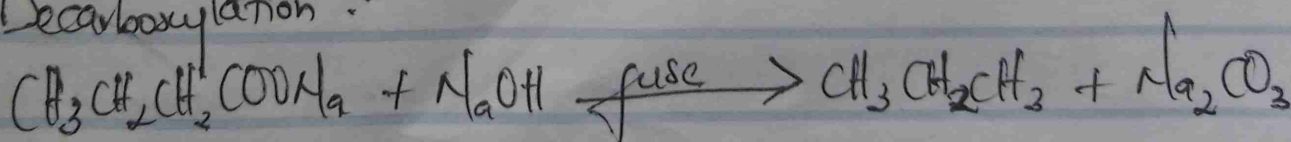


(where R may be 1°, 2°, 3° aliphatic alkyl or aryl radical)

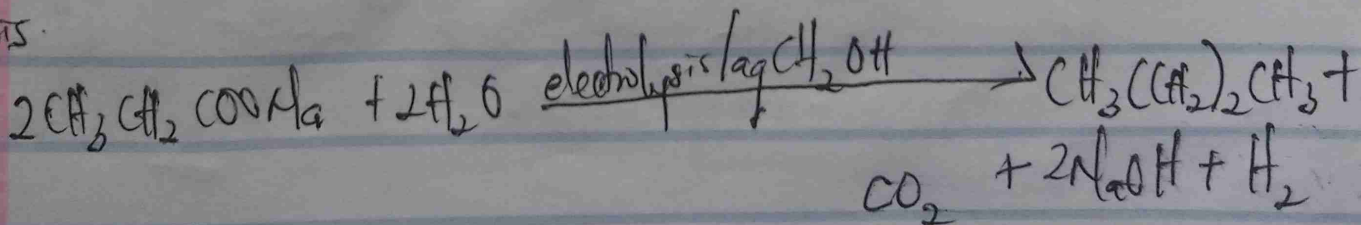
5i Reduction :-



ii Decarboxylation :-



Kolbe Synthesis.



as Esterification :-

