

SHERIFF FATIMA

19/MHS 01/398

1. HCOOH - Methanoic acid
 $\text{HOOC(CH}_2)_4\text{COOH}$ - Pentan-1,5-dioic acid
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ - Butanoic acid
 $\text{HO}_2\text{C}-\text{CO}_2\text{H}$ - Ethanedioic acid
 $\text{CH}_3(\text{CCH}_2)_4\text{COOH}$ - Hexanoic acid
 $\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_2\text{COOH}$ - Hex-4-enoic acid

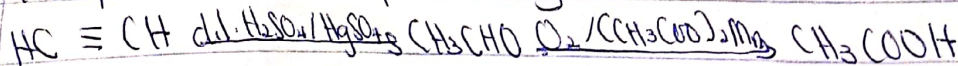
2. Physical appearances: All simple aliphatic carboxylic acids up to C_{10} are liquids at room temperature. Most other carboxylic acids are solid at room temperature although anhydrous carboxylic acid freezes to an ice-like solid below the room temperature.

ii Boiling points: Boiling point increases with increasing relative molecular mass. Aromatic carboxylic acids are crystalline solids and have higher melting points than their aliphatic counterparts of comparable relative molecular mass.

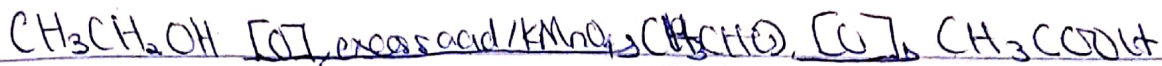
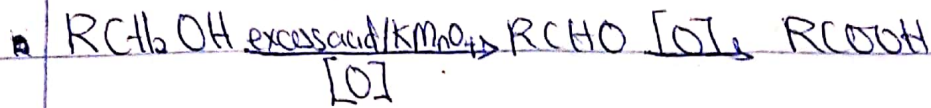
iii Solubility: Lower molecular mass carboxylic acids with up to four carbon atoms in their molecules are soluble in water; this is largely due to their ability to form hydrogen bonds with water molecules. The water solubility of the acids decreases as the relative molecular mass increases because the structure becomes more relatively more hydrocarbon in nature and hence covalent. All carboxylic acids are soluble in organic solvents.

3. From Carbon II oxide: Methanoic acid is manufactured by adding CO under pressure to hot aqueous solution of NaOH . The free carboxylic acid is liberated by careful reaction with H_2SO_4 .

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

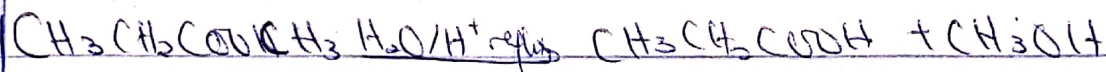
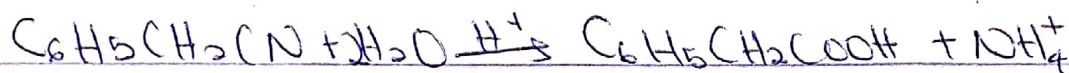


4) Oxidation of primary alcohols and aldehydes: Oxidation of primary alcohol and aldehydes are used to prepare carboxylic acids using the usual oxidizing agents i.e. $K_2Cr_2O_7 / KMnO_4$ in acidic solution.

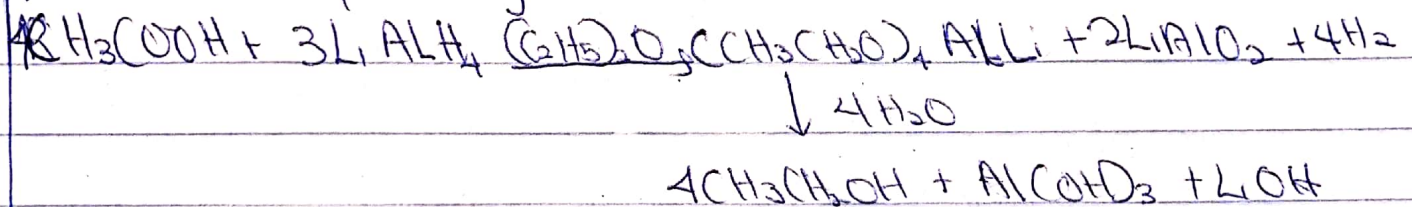


ii) Hydrolysis of nitriles (cyanides) or esters

Carboxylic acid can be prepared by the hydrolysis of nitriles or esters.

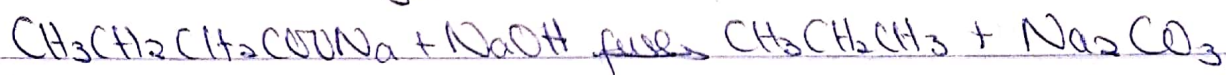


5) Reduction to primary alcohol

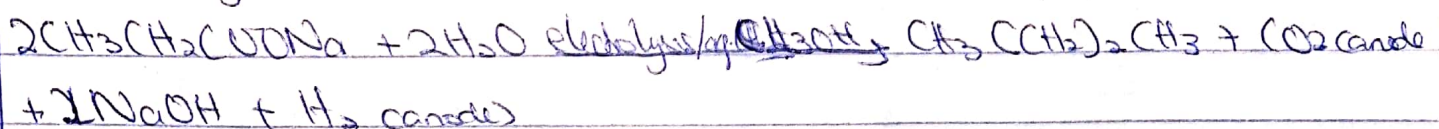


ii) Decarboxylation

Thermal decarboxylation



Kolbe synthesis



iii) Esterification

