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### CHEM 102 ASSIGNMENT (CARBOXYLIC ACIDS)

① Give the IUPAC names of the following

→  $\text{HCOOH}$  - Methanoic acid

→  $\text{HOOCCH}_2\text{CH}_2\text{CH}_2\text{COOH}$  - 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

→  $\text{CH}_3(\text{CH}_2)_4\text{COOH}$  - Hexanoic acid

→  $\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_2\text{COOH}$  - Hex-4-enoic acid

② Discuss briefly the physical properties of Carboxylic acids under the following headings

→ Physical appearances: All simple aliphatic carboxylic acids up to  $\text{C}_{10}$  are liquids at room temperature. Most other carboxylic acids are solid at room temp. although anhydrous carboxylic acid (acetic acid) also known as glacial ethanoic acid freezes to an ice-like solid below the room temperature.

→ Boiling Points: This increases with increasing relative Molecular Mass.

3 \* Aromatic Carboxylic acids are crystalline solids and have higher melting points than their aliphatic counterparts of comparable relative Molecular Mass.

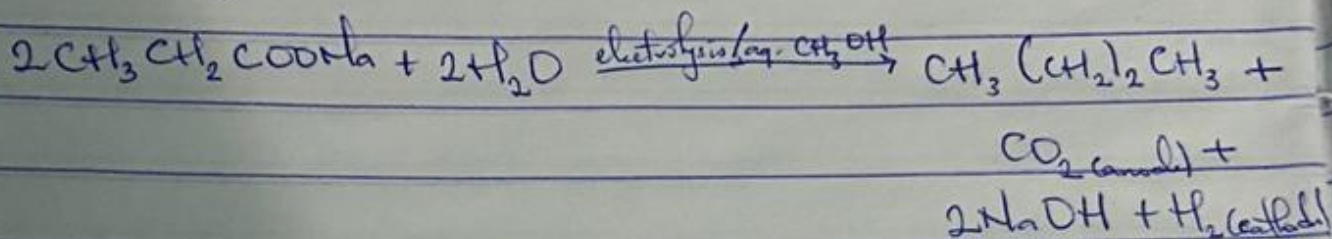
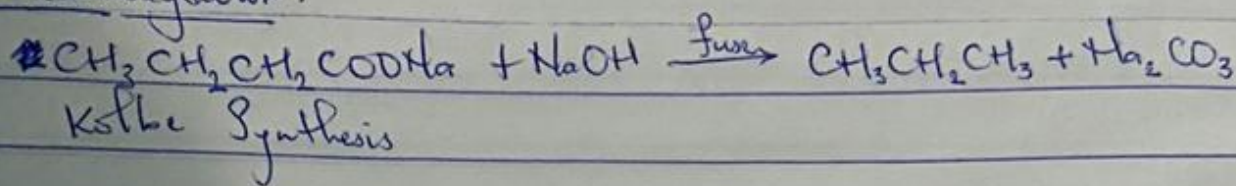
→ Solubility: Lower Molecular Mass Carboxylic acids with up to four Carbon atoms in their molecules are soluble in water. This is largely due to their ability to form hydrogen bonds with water molecules. The water solubility of the acids decreases as the relative Molecular Mass increases because the structure becomes relatively more hydrocarbon in nature and hence covalent. All Carboxylic acids are soluble in organic solvent.







⇒ Decarboxylation:



⇒ Esterification

