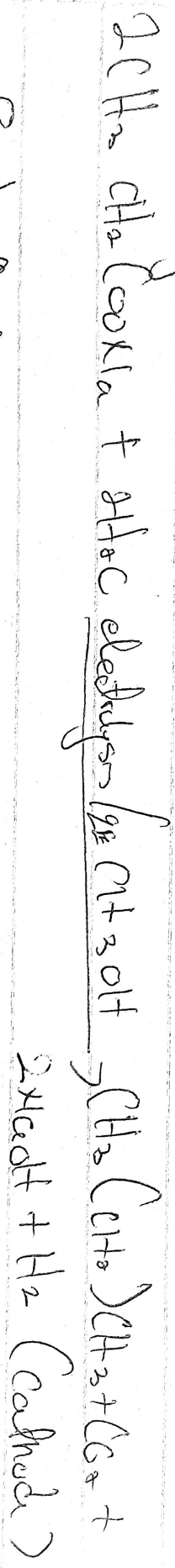


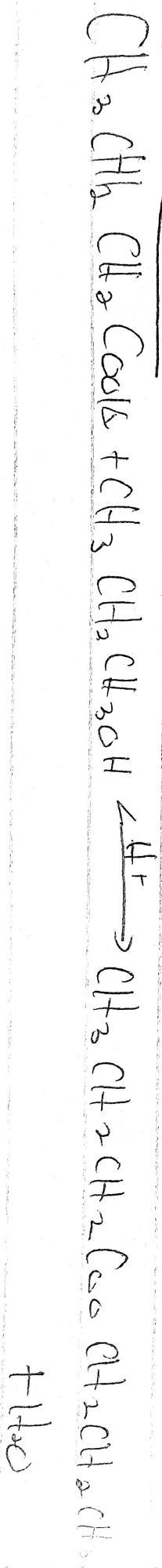
B) Decarboxylation



Kolbe Synthesis



C) Esterification



relatively more hydrocarbon in nature and hence conventional. All carboxylic acids are soluble in organic solvents.

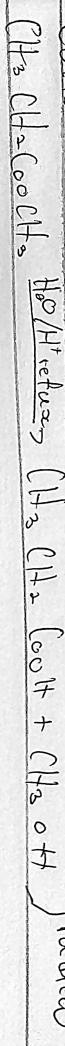
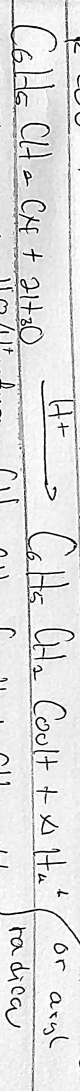
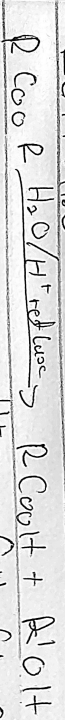
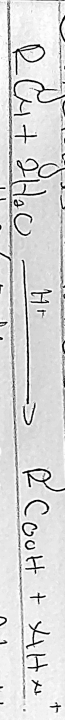
3) From Petroleum - liquid phase air oxidation of C<sub>5</sub>-C<sub>7</sub> alkanes, obtained from petroleum of high temp and press will give C<sub>5</sub>-C<sub>7</sub> carboxylic acids with methane, propane and butane as by-products.

C<sub>5</sub>-C<sub>7</sub> O<sub>2</sub> / High temperature and pressure → C<sub>5</sub>-C<sub>7</sub> Carboxylic acid

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

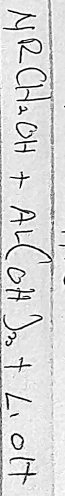
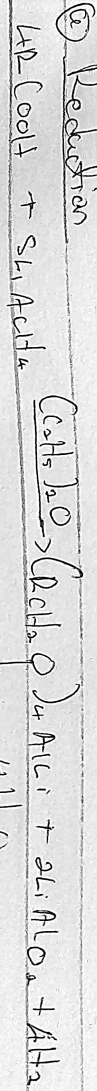


4) Hydrolysis of nitriles (Cyanides) or esters



5) Both chemical equations only outline the reduction, decarboxylation and esterification of carboxylic acids.

6) Reduction



AIKI DAVID JUSTKI

19/EX16.07/004

CHEM 102 (Carboxylic Acid)

### Assignment

①  $\text{HCOOH}$  - Methanoic acid

$\text{HOOCCH}_2\text{CH}_2\text{COOH}$  - Pentan-1,5-dioic acid

$\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$  - Butanoic acid

$\text{H}_2\text{C}=\text{CO}_2\text{H}$  - Ethanedioic acid

$\text{CH}_3(\text{CH}_2)_7\text{COOH}$  - Heptanoic acid

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

② Physical appearance: All simple aliphatic carboxylic acids up to  $\text{C}_6$  are liquids at room temperature. Most other carboxylic acids are solid at room temp although anhydrous carboxylic acid (acetic acid) also known as glacial acetic acid freezes to an ice-like solid below the room temp.

③ Boiling Point: This 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.

④ 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 acid decreases as the relative molecular mass increases because the structure becomes