

Name Belle Hawaii Olykassala

Matr 191111021034

Dept Nursing Science

Course CHM 102

Assignment:

- 1-  $\text{HC}\text{OOH} \rightarrow$  Methanoic acid
- 2-  $\text{H}\text{BrO}\text{C}\text{H}_2\text{C}\text{H}_2\text{CO}\text{OH} \rightarrow$  Pentan-1,5-dioic acid
- $\text{CH}_3\text{CH}_2\text{CH}_2\text{CO}\text{OH} \rightarrow$  Butanoic acid
- $\text{H}_2\text{C}=\text{C}(\text{CO}_2\text{H})_2 \rightarrow$  Ethenedioic acid
- $\text{C}_6\text{H}_5\text{CO}\text{OH} \rightarrow$  Benzoic acid
- $\text{C}_6\text{H}_5\text{CH}_2\text{CO}\text{OH} \rightarrow$  Phenylacetic acid

2) Physical appearance

Most of carboxylic acids are solid at room temperature but all simple aliphatic carboxylic acids upto  $\text{C}_{10}$  are liquids at room temperature. Aromatic carboxylic acid like benzoic acid freezes to an ice-like solid below room temp.

1) Boiling point

The boiling point increases with increasing relative molecular mass. Aromatic carboxylic acid has higher melting points than their aliphatic counterparts at comparable  $\text{R}$  group solubility.

All carboxylic acids are soluble in organic solvents. Lower molecular mass carboxylic acids with up to four carbon atoms in their molecules are soluble in water from ethanol.

3)

Ethanoic acid is obtained commercially by the liquid phase air-oxidation of 5% solution of ethanol to ethanoic acid using manganese(IV) ethanoate catalyst.  
 $\text{C}_2\text{H}_5\text{CO}\text{OH}$   
 $\text{CH}_3\text{CO}\text{OH}$

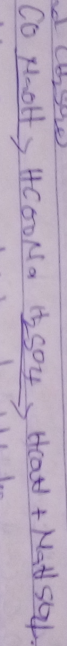
11. Fossil hydrocarbons

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 carbonic acid is

liberated by reaction with atmospheric CO<sub>2</sub>

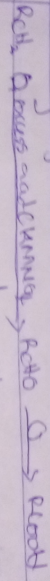
acid (CH<sub>2</sub>SO<sub>2</sub>)



4) Oxidation of primary alcohols and aldehydes -

It can be used to prepare carboxylic acids using

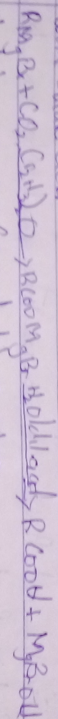
oxidizing agents in acidic solution.



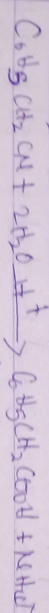
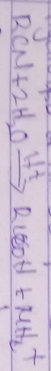
12. Carbonation of engineered reagent

Aliphatic carboxylic acids are obtained by bubbling carbon dioxide into the engineered reagent then hydrolysed

with dilute acid

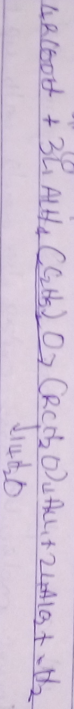


13. Hydrolysis of esters (pendants) or esters

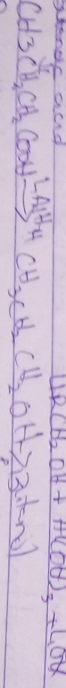


5. Reduction of Carboxylic acid

LiAlH<sub>4</sub> or NaBH<sub>4</sub>



Strong acid



Decarboxylation → CH<sub>3</sub>CO<sub>2</sub>CH<sub>3</sub> → CH<sub>3</sub>COOH + MeOH

Reductive synthesis → 2CH<sub>3</sub>CO<sub>2</sub>CH<sub>3</sub> + 2H<sub>2</sub> → CH<sub>3</sub>CH<sub>2</sub>CO<sub>2</sub>CH<sub>3</sub> + MeOH

Eslen Reaction

