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DEPT: MEDICINE AND SURGERY

COLLEGE: MHS

MATRIC: 19/MHSOL/416

COURSE: CHM 102

ASSIGNMENT

1. Give the IUPAC names of the following Carboxylic Acids.

a. HCuOtt \rightarrow Methanoic acid.

b. $\text{HCOCH}_2\text{CH}_2\text{CH}_2\text{COtt}$ \rightarrow Pentan-1,5-dioic acid.

c. $\text{CH}_3\text{CH}_2\text{CH}_2\text{COtt}$ \rightarrow Butanoic acid.

d. $\text{HO}_2\text{C-CO}_2\text{H}$ \rightarrow Ethanedioic acid.

e. $\text{CH}_3\text{C(CH}_3)_2\text{COtt}$ \rightarrow Hexanoic acid.

f. $\text{CH}_3\text{CH}=\text{CHCH}_2\text{COtt}$ \rightarrow Hex-4-enoic acid.

2. Discuss briefly the physical features of carboxylic acids under the following headings:

a. Physical Appearance: All simple aliphatic carboxylic acids up to C_9 are liquids at room temperature. Most other carboxylic acids are solid at room temperature although anhydrous carboxylic acid (acetic acid) also known as glacial ethanoic acid freezes to an ice-like solid below the room temperature.

b. 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.

c. Solubility: Lower molecular mass carboxylic acids with up to four carbon atoms in their molecules are soluble

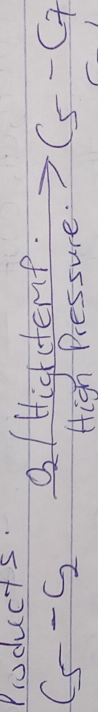
in water. They are largely due to their relative molecular to turn hydrogen bonds with water molecules. The water solubility of the acids decreases as the relative molecular mass increases because the structure becomes relatively more hydrocarbon in nature and hence curvalent.

3. Write two industrial preparation of carboxylic acids.

Answer:

a. From Petroleum:

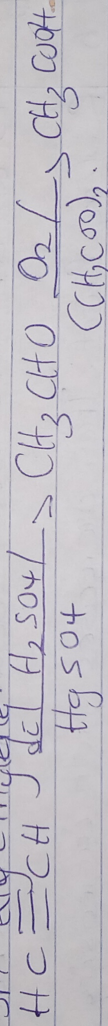
liquid phase air oxidation of C₅-C₇ alkanes obtainable from petroleum at high temperature and pressure will give C₅-C₇ carboxylic acids with methanoic, propanoic and butanoic acids as by-products.



Carboxylic acids.

b. From Ethanol:

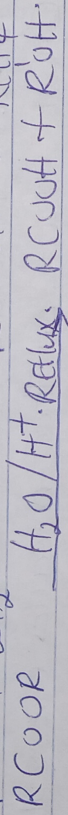
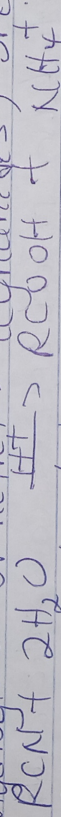
Ethanoic acid is obtained commercially by the liquid phase air-oxidation of 5% solution of ethanol to ethanoic acid using Manganate (VI) ethanoate catalyst. Ethanol itself is obtained from ethylene.

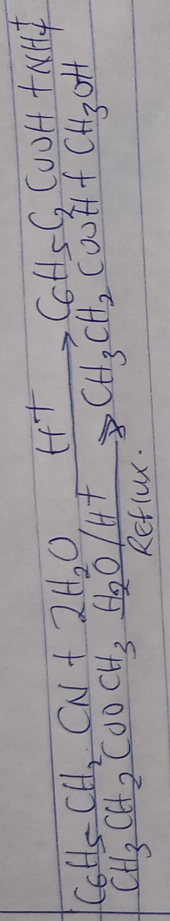


4. Write equations and brief explanation, discuss the synthetic preparation of carboxylic acid.

Answer:

Hydrolysis of nitriles (Cyanides) or esters.





5. Write chemical equation only outline the reduction, decarboxylation and esterification of carboxylic acid.

