**OMORODION OSAROGIE YOMA**

**COMPUTER ENGINEERING 19/ENG02/051**

**CHM 102 ASSIGNMENT**

**1**

|  |  |
| --- | --- |
| **ORGANIC COMPOUND** | **IUPAC NAME** |
| HCOOH | Methanoic acid |
| HOOCCH2CH2CH2COOH | Pentan-1, 5-dioic acid. |
| CH3CH2CH2COOH | Butanoic acid |
| HO2C-CO2H | Ethanedioic acid |
| CH3(CH2)4COOH | Hexanoic acid |
| CH3CH=CHCH2CH2COOH | Hex-4-eneoic acid |

**2**

**Physical Appearance:** All simple aliphatic carboxylic acids up to C10 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.

**Boiling point:** It 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.

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

**3**

**From carbon (ii) oxide:** Methanoic acids (formic acid) is manufactured by adding carbon (ii) oxide under pressure to not aqueous solution of sodium hydroxide. The free carboxylic acid is liberated careful reaction with tetraoxosulphate (VI) acid H2SO4.

CO NaOHH2SO4 HCOONa HCOKH + NaHSO4

**From Petroleum:** Liquid phase air oxidation of C5-C7 alkanes, obtainable of 5% solution of ethanol to ethanoic acid using magnate(ii)ethanoate catalyst .Ethanol itself is obtained from ethylene.

HC=L Dil.H2SO4/H2SO4 CH3CHO O2/(CH2COO)2 CH3COH

**4**

**Oxidation of primary alcohols and aldehydes:** Oxidation of primary alcohols and aldehydes can be used to prepare carboxylic acids using the usual oxidation agent (i.e. K2Cr2O7 or KMnO4) is acidic solution.

RCH2OH{ OH } Excess acid/KMNO4 RCHO {O} RCOOH

**Carbonation of Grignard reagent:** Aliphatic carboxylic acid are obtained by budding carbon (iv) oxide into the Grignard Reagent and then hydrolyzed with dilute acid.

RMGBR + CO2  (C2H4)2O RCOOMGBR H2O/dil.acid RCOOH + MGBROH

**Hydrolysis of nitric (cyanides) or esters:**

RCN+2H2 {H+} RCOOH + NHi.

(R=alkyl or aryl radical)

RCOOR' H2O/H’ reflux RCOOH + ROH.

**5**

**Reduction:**

4RCOOH + 3LiAlH4 (C2H5)2O (RCH­2O)4 AlLi + 2LiAlO2 + 4H2

4RCH2OH + Al(OH)3 + LiOH

CH3CH2CH2COOH LiAlH4 CH3CH2CH2CH2OH

Butanoic acid Butanol

**Decarboxylation:**

CH3CH2CH2COONa + NaOH Fuse CH3CH2CH2 + Na2CO3

Kolbe Synthesis

2CH3CH2COONa + 2H2O electrolysis/aq. CH3OH CH3(CH2)CH3 + CO2 + 2NaOH + H2

**Esterification:**

CH3CH2CH2COOH + CH3CH2CH2OH H+ CH3CH2CH2COOCH2CH2CH3  +H2O