

Computer Engineering
19/ENGG021025

Assignment on Carboxylic acid

1. Give the IUPAC names of the following compounds

- i. HCOOH - Methanoic acid
- ii. $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ - Butanoic acid.
- iii. $\text{CH}_3(\text{CH}_2)_4\text{COOH}$ - ~~Pentanoic acid~~ Hexanoic acid.
- iv. $\text{HOOCCH}_2\text{CH}_2\text{CH}_2\text{COOH}$ - Pentan-1,5-dioic acid.
- v. $\text{HO}_2\text{C}-\text{CO}_2\text{H}$ - Ethanedioic acid
- vi. $\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_2\text{COOH}$ - ~~Hexanoic acid~~ Hex-4-enoic acid.

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

i. Physical appearance

All simple aliphatic Carboxylic acids up to C_{10} are liquids at room temperature. Most other Carboxylic acids are solids at room temperature although acetic acid freezes to an ice-like solid below room temperature.

ii. Boiling Points

Boiling point 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.

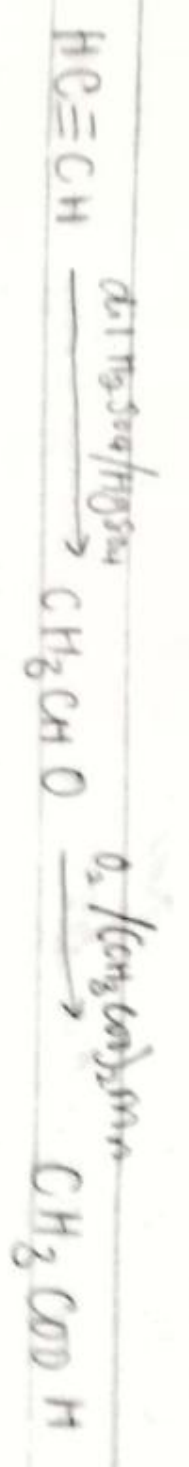
iii. Solubility

The solubility Carboxylic with up to C_4 are soluble in water. It solubility decreases with increasing molecular mass because the structure becomes ~~more~~ relatively more hydrocarbon in nature and hence covalent

3. Write two industrial preparations of carboxylic acids
 1. from carbon(II) oxide.



ii. From ethyne.

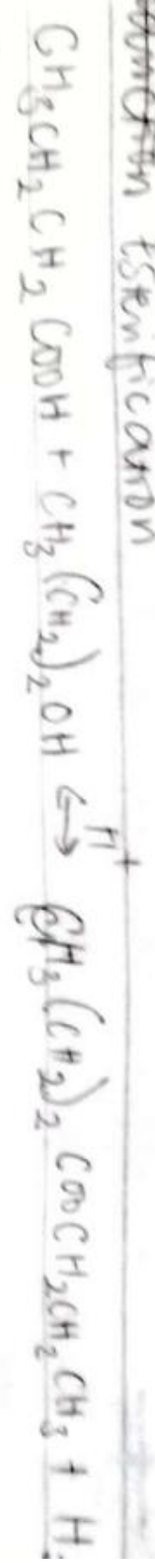


4. Write equations and brief explanation discuss the types preparation of carboxylic acid

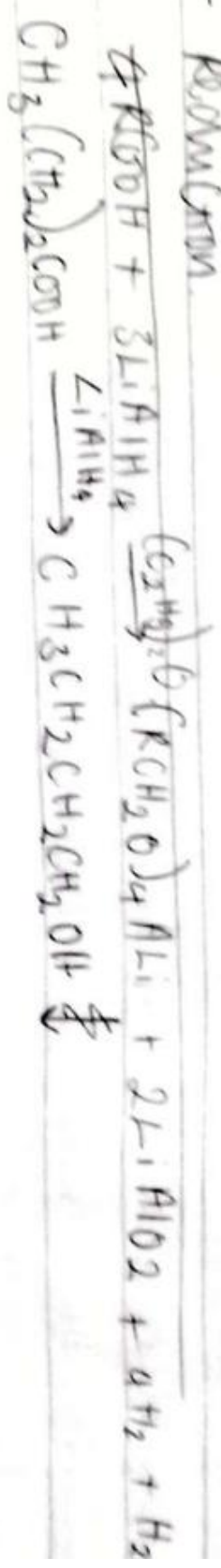
- Oxidation of primary alcohols and aldehydes.
 Oxidation of primary alcohols and aldehydes can be used to prepare carboxylic acids using the silver oxidizing agents (i.e. $\text{K}_2\text{Cr}_2\text{O}_7$ or KMnO_4) in acidic medium.
 $\text{RCH}_2\text{OH} \xrightarrow{[\text{O}]}$ acids and formula $\rightarrow \text{RCOOH}$

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

~~Reduction~~ Esterification



- Reduction



- Decarboxylation

