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9/11/19 or 10/19

NURJING

Medicine and health sciences.

Give the IUPAC names of the following compounds.

(1) HCOOH - methanoic acid.

(2) $\text{HOOCH}_2\text{CH}_2\text{CH}_2\text{COOH}$ - Pentan-1,5-dioic acid.

(3) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ - Butanoic acid.

(4) $\text{H}_3\text{C}-\text{C}(=\text{O})-\text{CO}_2\text{H}$ - Ethanoic acid.

(5) $\text{CH}_3(\text{CH}_2)_4\text{COOH}$ - hexanoic acid.

(6) $\text{CH}_3\text{CH}=\text{CH}(\text{CH}_2)_2\text{COOH}$ - ~~Hexo~~-4-enoic acid.

(7) Discuss briefly the physical properties of carboxylic acids under the following heading (i) physical appearance.

(i) Boiling Point

(ii) Solubility.

(8) Physical appearance.

All simple carboxylic acid ~~up~~ up to C_6 are liquid at room temperature. Other carboxylic acid are solid. Anywhere carboxylic acid (lactic acid) also known as galactaric acid becomes solid ice-like below room temperature.

Boiling point

Increasing

The boiling point increases with ^{the} relative molecular mass. Aromatic carboxylic acids are crystalline ^{than} solid than ^{the} Aliphatic counterparts of comparable relative molecular mass.

Solubility

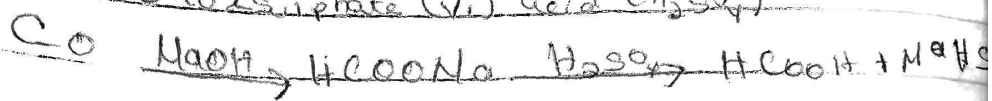
Lower molecular mass carboxylic acids with up to four carbon atoms in their molecules are soluble in water; the water solubility of the acids decreases as the relative molecular mass increases because the structure becomes relatively

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

3. Write two ~~INDUS~~ Industrial preparations of carboxylic acids.

Answer:
FROM CARBON (II) oxide

Methanoic acid (formic acid) is manufactured by adding Carbon (II) oxide under pressure to the aqueous solution of sodium hydroxide. The free carboxylic acid is liberated by careful reaction with tetraoxosulphate (VI) acid (H_2SO_4)



FROM ETHANOL

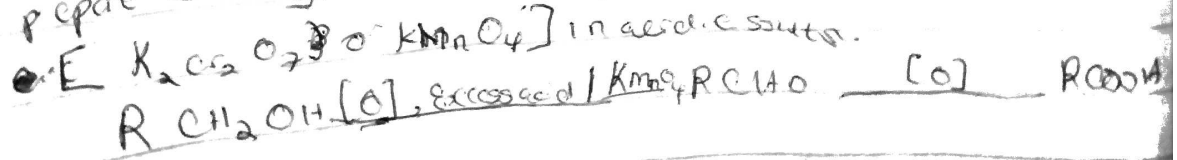
Ethanoic acid is obtained commercially by the liquid phase air-oxidation of 5% solution of ethanol in ethanoic acid using Manganese (II) ethanoate catalyst. Ethanol is obtained from ethylene.



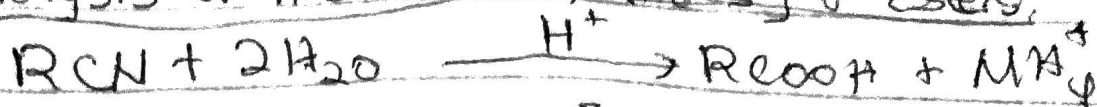
4) Which equations and brief explanation discuss the synthetic preparation of carboxylic acids?

Answer:

Oxidation of primary alcohols and aldehydes
Oxidation of primary alcohols and aldehydes can be used to prepare carboxylic acids using the usual oxidizing agents.



Hydrolysis of nitriles [Cyanides] or esters,



R = alkyl or aryl radical



Q) with chemical equation only, outline the reduction, decarbonylation and esterification of carboxylic acid.

Answer.

Reduction of primary Alcohols



Decarboxylation



Esterification

