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**COURSE CODE: GST 122**

**DEPARTMENT: MBBS**

**MATRIC NUMBER: 19/MHS01/341**

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DEPT. MBBS

COURSE CODE CHEM 102

MATRIC NO. 19/MH501/341

1. Give the IUPAC names of the following compounds

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

2. Discuss briefly the physical properties of carboxylic acids under the following

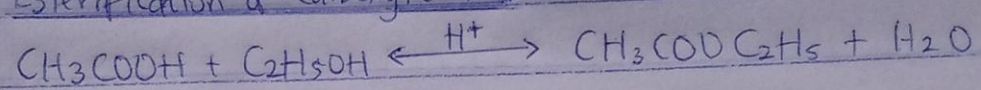
- i. Physical appearance: All simple aliphatic carboxylic acids up to 10 carbon atoms,  $\text{C}_{10}$ , are liquids at room temperature. Anhydrous carboxylic acid, also known as acetic acid or glacial ethanoic acid freezes to an ice-like solid ~~below~~ below room temperature. Most other carboxylic acids are solid at room temperature.
- ii. Boiling points: As the relative molecular mass increases, so does the boiling point. Aromatic carboxylic acids which are crystalline solids have higher melting points than their aliphatic counterparts of comparable relative molecular mass.
- iii. Solubility: Lower molecular mass carboxylic acids with up to four carbon atoms in their molecules are soluble in water due to their ability to form hydrogen bonds with water molecules. As the acid's covalency increases (the relative molecular mass ~~increases and its~~ <sup>and hydrocarbon</sup> nature ~~increases~~), the water solubility of the acid decreases. All carboxylic acids are soluble in organic solvents.

3. Write two industrial preparations of carboxylic acids.

- I. From carbon (II) oxide: Methanoic (formic) acid is manufactured by adding carbon (II) oxide under pressure to hot aqueous solution of sodium hydroxide. The free carboxylic acid is liberated by careful reaction with tetraoxosulphate (VI) acid.



II. Esterification of Carboxylic Acids.



Ethanoic acid

Ethanol

Ethylethanoate