

1. IUPAC Names of the following.

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 properties of carboxylic acids under the following

a. Physical Appearance

All simple aliphatic acids up to C₁₀ are liquids at room temperature. Most other carboxylic acids are solids at room temperature although anhydrous carboxylic acid also known as glacial ethanoic acid freezes to an ice-like solid below the room temperature

b. Boiling Point

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,

c. Solubility

Lower molecule mass carboxylic acids with up to four carbon atoms in their molecules are solute in water; this is largely due to their ability to form hydrogen bonds with water molecules. The water solubility of acids decreases as the relative molecular mass increases because the structure becomes relatively more hydrocarbon in nature and hence covalent. All carboxylic acids are solute in organic solvents.

3. Industrial Preparations of Carboxylic Acids

From

Carbon (II) oxide



From Petroleum



4. Synthetic Preparation of Carboxylic Acids

Oxidation of primary alcohols and aldehydes: Oxidation of primary alcohols and aldehydes can be used to prepare carboxylic acids using the usual oxidising agents in acidic solution.



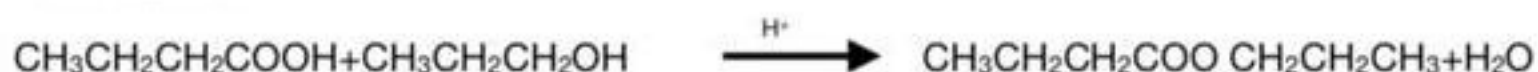
5. Reduction



Decarboxylation



Esterification



1. IUPAC names of the following

CH₃OCH₃ - Methoxymethane

CH₃CH₂OCH₂CH₃ - Ethoxyethane

(CH₃CH₂CH₂CH₂)₂O - Butoxymethane

CH₃CH₂OCH₃ - Methoxyethane

CH₃CH₂CH₂OCH₂CH₃ - Ethoxypropane

2. Physical States: At room temperature, ethers are colourless, neutral liquids with pleasant odours. The lower aliphatic ethers are highly flammable gases or volatile.

Density: Most of the simple ethers are less dense than water, although the density increases with increasing relative molecular mass and some of the aromatic ethers are in fact denser than water.

Solubility: Ethers are less soluble in water than are the corresponding alcohols. Lower molecular weight ethers such as methoxymethane are fairly soluble in water since the molecules are able to form hydrogen bonds with the water but as the hydrocarbon content of the molecules increases, there is a rapid decline in solubility. They are miscible with most organic solvents.

Boiling Point: Low molecular mass ethers have a lower boiling point than the corresponding alcohols but these ethers containing alkyl radicals larger than four carbon atoms, the reverse is true.

3. Controlled catalytic hydration of olefins



2-isopropoxypropane

Partial dehydration of alcohols. Simple ethers are manufactured from alcohol by catalytic dehydration.



4. Used as a gaseous sterilising agent

Used as intermediate in the hydrolytic manufacture of ethylene glycol

Used in the preparation of nonionic emulsifying agents, plastics, plasticisers and several synthetic textiles.