

YOUCHA PRAISE

MBS

19/MHSO₁/441

i) HCOOH - Methanoic acid

ii) $\text{HOOCCH}_2\text{CH}_2\text{CH}_2\text{COOH}$ - Pentan-1,5-dioic acid

iii) $\text{HO}_2\text{C}-\text{CO}_2\text{H}$ - Ethanedioic acid

iv) $\text{CH}_3(\text{CH}_2)_4\text{COOH}$ - Hexanoic acid

v) $\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_2\text{COOH}$ = Hex-4-eneoic acid

vi) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ = Butanoic acid

2: Physical appearance

All simple aliphatic carboxylic acids up to C_{10} are liquids @ room temperature. Most other carboxylic acids are solid @ room temperature although anhydrous carboxylic acid (acetic acid) also known as glacial ethanoic acid freezes to an ice-like solid below the room temperature.

ii) Boiling Points

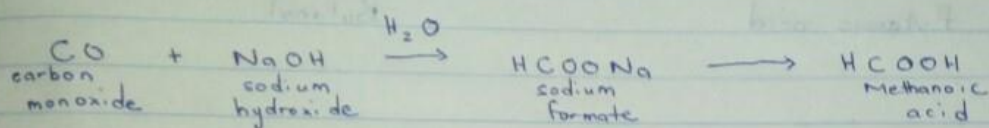
Boiling points increases with increasing relative molecular mass. Aromatic carboxylic acids are crystalline solids & have higher melting points than their aliphatic counterparts of comparable relative molecular mass.

iii) Solubility

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

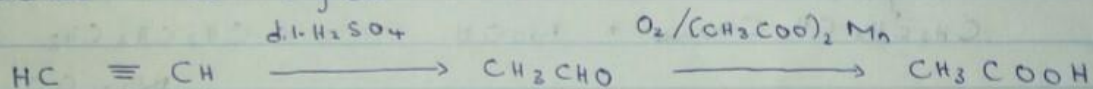
3: From carbon (II) oxide

It is made by the action of sulfuric acid upon sodium formate, which is produced from carbon monoxide and sodium hydroxide



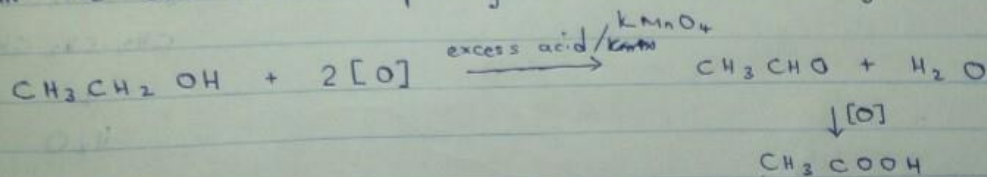
ii From ethanal

Ethanoic acid is obtained commercially by the liquid phase air-oxidation of 5% solution of ethanal to ethanoic acid using manganite (II) ethanoate catalyst. Ethanal itself is obtained from ethylene



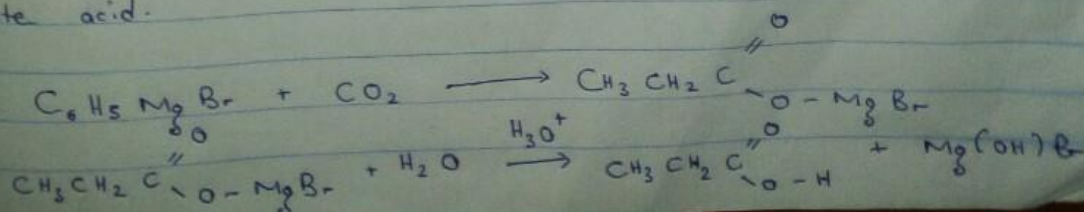
4: Oxidation of primary alcohols and aldehydes

With the use of oxidizing agents such as $\text{K}_2\text{Cr}_2\text{O}_7$ or KMnO_4 in acidic solution, carboxylic acids can be prepared from the oxidation of primary alcohols and aldehydes.

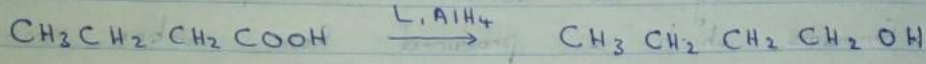


ii Carbonation of Grignard reagent

Aliphatic carboxylic acids are obtained by bubbling carbon(IV) oxide into the Grignard reagent and then hydrolyzed with dilute acid.



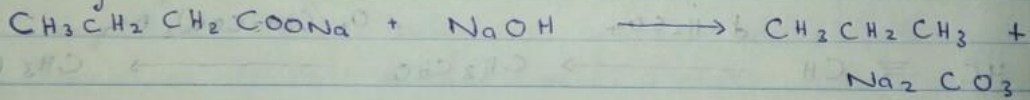
5: Reduction to primary alcohol



Butanoic acid

Butanol

ii: Decarboxylation



iii: Esterification

