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DEPARTMENT: PHARMACY

COURSE: CHEM 102

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1. HCOOH- Methanoic acid

$HOOCCH_2CH_2CH_2COOH$-petan-1, 5-doic acid

$CH_3CH_2CH_2COOH$- Butanoic acid

$HO_2C\text{-}CO_2H$- Ethandioic acid

$CH_3(CH_2)_4COOH$- Hexanoic acid

$CH_3CH{=}CHCH_2CH_2COOH$- Hex-4-eneoic acid

2. Physical appearance

All simple aliphatic carbolyxic acids up to c_{10} are liquids in temperature.

Boiling points

Boiling points increases with increasing relative molecular mass.

Solubility

Lower molecular mass carboxylic acids with up to four carbon atoms in thier molecules are soluble in water this largely due to thier ability to form hydrogen bonds with water molecules.

3. Two industrial preparations of carboxylic acids

. From carbon(II)0xide

From ethanol

4. Synthetic preparations

.Oxidation of primary alcohols and aldehydes

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

RCH_2OHEXCESS ACID---------RCHO -------RCOOH

. Carbonation of grignard reagent

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

$RMgBr + CO_2$ $(C_2H_3)_2$ -------- RCOOMg ---------RCOOH+ MgBrOH

. Hydrolysis of nitriles(cyanides) or esters

$RCN + 2H_2O \longrightarrow RCOOH + NH_4^+$