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MEDICAL AND HEALTH SCIENCES / MBBS

19/MHS01/059

CHEMISTRY 102

1)  $\text{HCOOH} \rightarrow$  Methanoic Acid

$\text{HCOOCCH}_2\text{CH}_2\text{COOH} \rightarrow$  Pentan-1,5-dioic acid

$\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH} \rightarrow$  Butanoic Acid

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

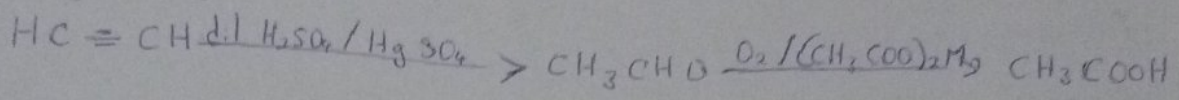
$\text{CH}_3(\text{CH}_2)_4\text{COOH} \rightarrow$  Hexanoic acid

$\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_2\text{COOH} \rightarrow$  Hex-4-enoic acid

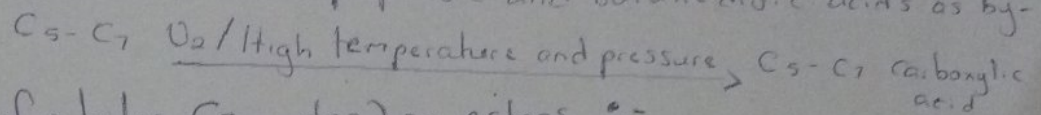
2) Boiling points:- Increases with increasing relative molecular mass. Aromatic carboxylic acids are crystalline solids and have higher melting points than their aliphatic counterparts of comparable relative molecular mass.

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.

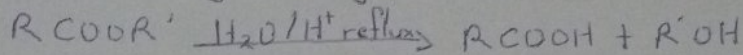
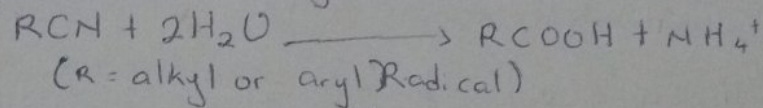
(3a) Ethanal: Ethanoic acid is obtained commercially by the liquid phase air-oxidation of 5% solution of ethanal to ethanoic acid using manganese(II) ethanoate catalyst.



(b) Petroleum: Liquid phase air oxidation of C<sub>5</sub>-C<sub>7</sub> alkanes, obtainable from petroleum at high temperature and pressure will give C<sub>5</sub>-C<sub>7</sub> carboxylic acids with methanoic, propanoic and butanedioic acids as by-products.

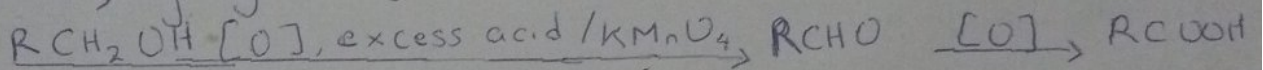


(4)A Hydrolysis of nitriles (Cyanides) or esters :-



(B) Oxidation of primary alcohols and aldehydes :-

It can be used to prepare carboxylic acids using the usual oxidizing agents (i.e. K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> or KMnO<sub>4</sub>) in acidic solution.



(C) Carbonylation of Grignard reagent

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

