

19/ENG01/005

Chemical Engineering

Chalkwedge Excellence

1. HCOOH - hydroxy carboxylic acid, methanoic acid.

2. $\text{HOOCCH}_2\text{CH}_2\text{COOH}$ - pentan-1,5-dioic acid.

3. $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ - butanoic acid.

4. $\text{HO}_2\text{C}-\text{CO}_2\text{H}$ - ethanedioic acid.

5. $\text{CH}_3(\text{CH}_2)_4\text{COOH}$ - hexanoic acid.

6. $\text{CH}_3\text{CH}=\text{CHCH}_2\text{COOH}$ - hex-1-enoic acid.

Boiling points of the acids increases with increase in the number of carbon atoms. Simpler carboxylic acids with less than 10 carbon atoms are liquid. The rest of the majority are solid.

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Acids with 4 carbon atoms (butanoic acid) are soluble in water as a result of (-H). These acids are soluble in organic solvents.

i) Adding carbon(IV) oxide to NaOH with H_2SO_4 in a reversible reaction.

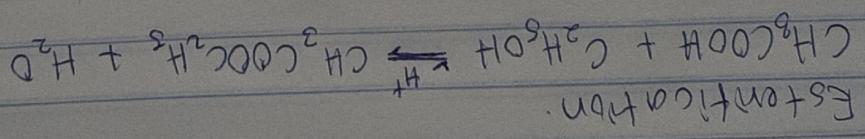
ii) Oxidation of C_5-C_7 alkanes at high temperature and pressure.

+ Hydrolysis of esters.

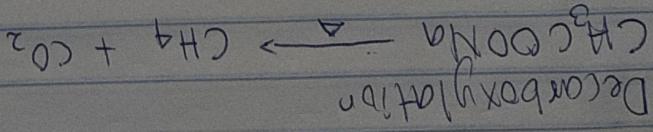
+ Oxydation of primary alcohols using KMnO_4 in excess.

g. Synthetic preparation

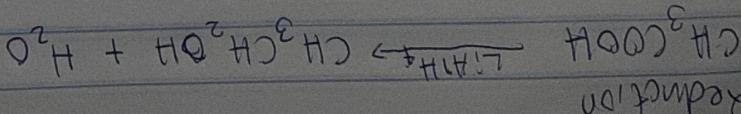
$\text{CH}_3\text{COCH}_3 \xrightarrow[\text{H}^+ \text{ reflux}]{\text{H}_2\text{O}}$ $\text{CH}_3\text{COOH} + \text{CH}_3\text{OH}$



Esterification



Decarboxylation



Reduction