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19/MHS01/258

CHEM 102 ASS CARBOXYLIC ACIDS

- 1) i) HCOOH — Methanoic acid
- ii) $\text{HOOCCH}_2\text{CH}_2\text{COOH}$ —
- iii) $\text{HOOCCH}_2\text{CH}_2\text{CH}_2\text{COOH}$ — Pentane-1-5-dioic acid
- iv) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ — Butanoic acid
- v) $\text{HO}_2\text{C}-\text{CO}_2\text{H}$ — Ethandioic acid.
- vi) $\text{CH}_3(\text{CH}_2)_4\text{COOH}$ — Hexanoic acid.
- vii) $\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_2\text{COOH}$ — Hex-4-enedioic acid

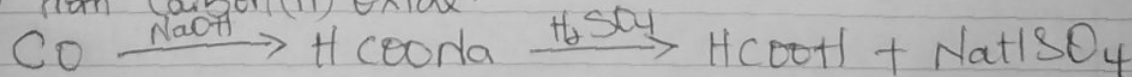
2) i) Physical appearance: All ~~aliphatic~~ simple aliphatic carboxylic acids up to C_{10} are liquids at room temperature. Most other carboxylic acid are solid at room temperature.

ii) Boiling point: Boiling point increases with increasing relative molecular mass

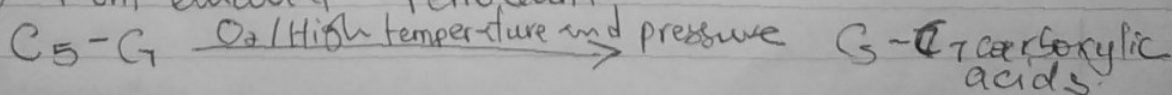
iii) Solubility: Lower molecular mass carboxylic acids with up to four carbon atoms in their molecules are soluble in water (due to hydrogen bonding). The water solubility of acids decreases as the relative molecular mass increases because the structure becomes relatively more hydrocarbon in nature and hence covalent.

3) INDUSTRIAL PREPARATIONS.

i) from Carbon(II) Oxide.



ii) From ~~ethanol~~ Petroleum.

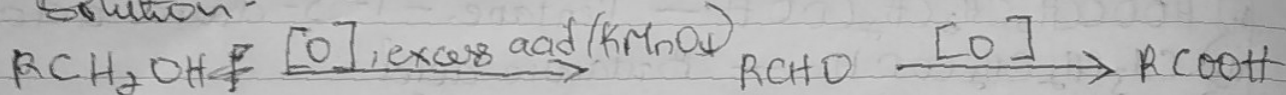


4) SYNTHETIC PREPARATION

i) Oxidation of primary ~~alcohols~~ alcohols and aldehydes:

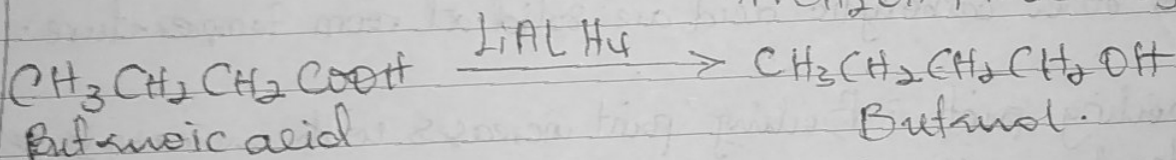
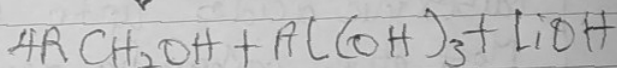
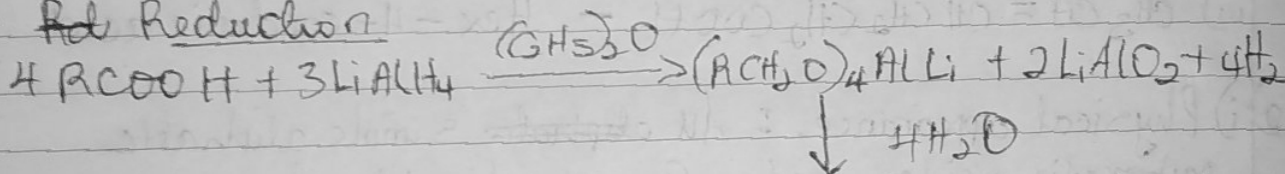
Oxidation of primary ~~alcohols~~ alcohols and aldehydes can

be used to produce prepare carboxylic acids using the usual oxidising agents ($K_2Cr_2O_7$ or $KMnO_4$) in acidic solution.

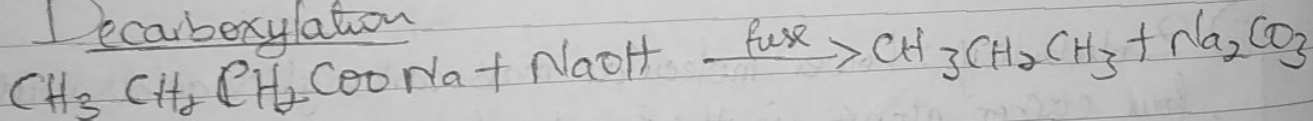


5. ~~i) Carbonation~~

5. Red Reduction



Decarboxylation



Esterification

