

NAME: Obavika Oghees yama Peraviors

Matric NO: 19/mns01083

Department of Nursing

Chem 102 Voluntary assignment

1. (i) HCOOH - formic acid

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

(iii) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ - Butanoic acid

(iv) $\text{HOOC}-\text{CH}_2-\text{CH}_2-\text{COOH}$ - Ethanedioic acid

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

(vi) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{COOH}$ - Heptanoic acid

2. Physical appearance

Most of carboxylic acids are ^{solid} at room temperature but all simple aliphatic carboxylic acids up to C10 are liquids at room temperature. Any long carboxylic acid (acetic acid) freezes to an ice-like solid below room temperature.

3. Boiling point

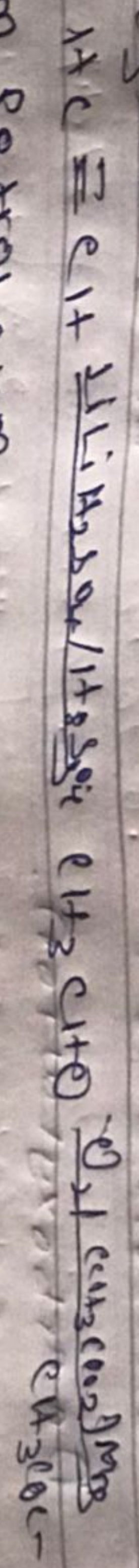
The boiling point increases with increasing relative molecular mass. All simple carboxylic acids have higher boiling points than their aliphatic counterparts of comparable R.M.M.

4. Solubility

All carboxylic acids are soluble in organic solvents but not in water. Most carboxylic acids with up to four carbon atoms in their molecules are soluble in water.

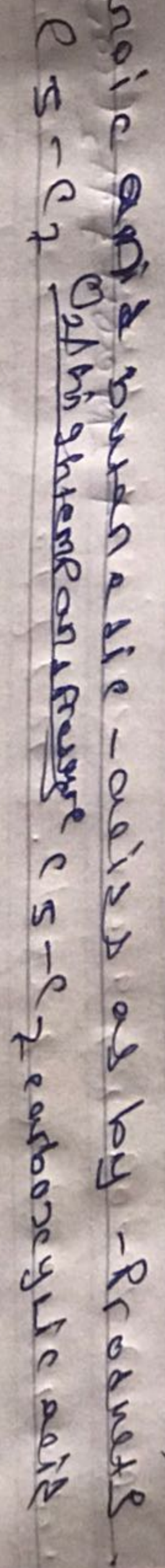
3) Two Industrial Preparations of carboxylic acids

1) From ethanoic acid - CH_3COOH
Ethanoic acid is obtained commercially by the
Oxidation of C_2H_5OH & oxidation of ethanol
to ethanoic acid using manganese(IV) ethanoate
catalysts.



11) From Propanoic acid

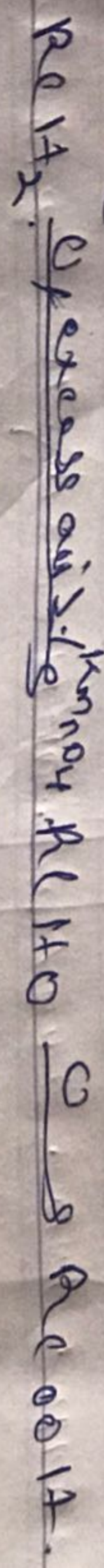
1) From Propanoic acid
Oxidation of propanoic acid to ethanoic acid
with CrO_3 & CrO_2 catalysts with methanolic
propanoic acid



12) Synthesis of ethanoic acid

1) Oxidation of primary alcohols and aldehydes

It can be used to prepare carboxylic acids using
oxidizing agents in acidic solution -

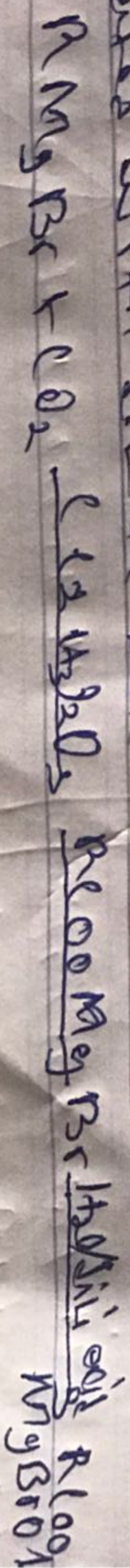


13) Oxidation of primary alcohol

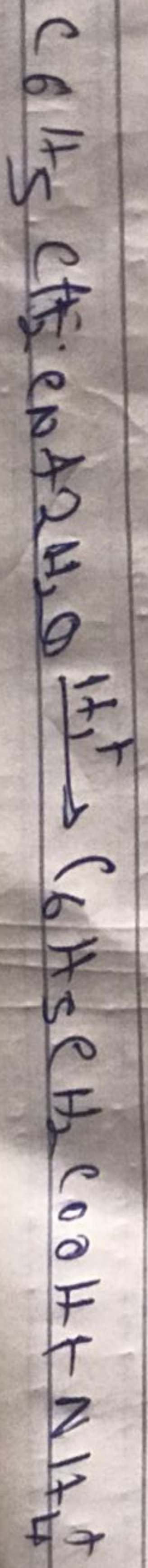
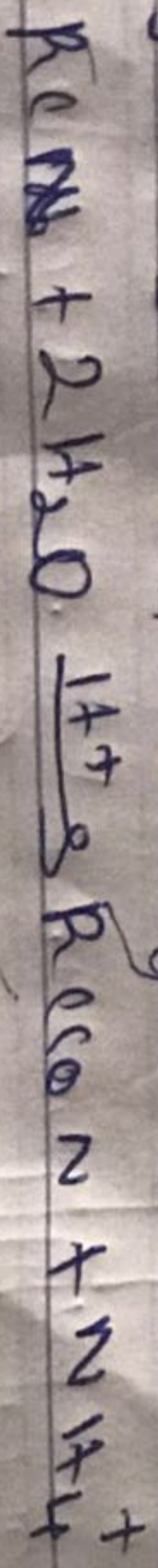
Aliphatic carboxylic acids are obtained by

oxidizing carboxylic acids & into the primary reagent

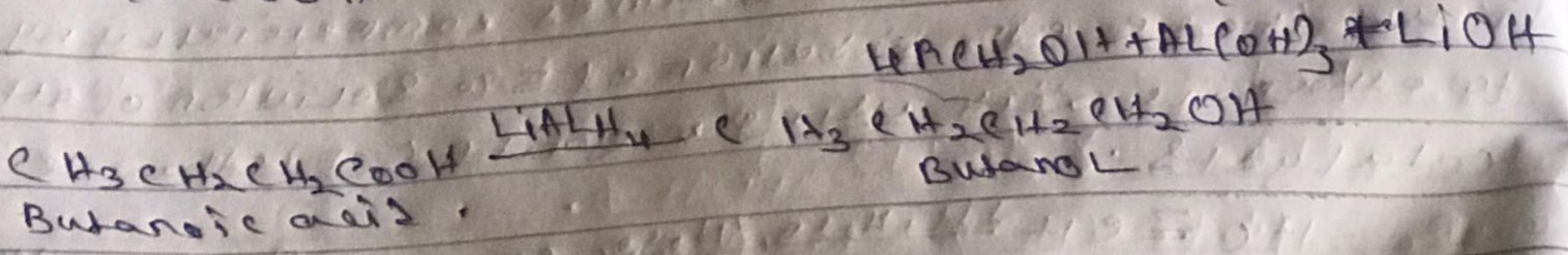
hydroxyl with lime acid



14) Synthesis of nitriles (cyanides) or esters



⑤ Reduction of carboxylic acid
 $4RCOOH + 3LiAlH_4 \xrightarrow{\text{ether}} 4RCH_2OH + 3LiOH + 2H_2$



Decarboxylation
 $CH_3CH_2CH_2COONa + NaOH \xrightarrow{\text{heat}} CH_3CH_2CH_3 + Na_2CO_3$

Kolbe synthesis
 $2CH_3CH_2COONa + 2H_2O \xrightarrow{\text{electrolysis}} CH_3OH + CH_3(CH_2)_2CH_3 + CO_2 \text{ (anode)}$
 $+ 2H_2 + H_2 \text{ (cathode)}$

Esterification

