

Name: EKPERIGIN ANITA ONOME

Matric no: A9/MITSOI/149 DEPT: M.B.B.S

14/4/20

Chem 102 Assignment

- a HCOOH - Methanoic acid.
- b $\text{HOOCCH}_2\text{CH}_2\text{CH}_2\text{COOH}$ - Pentan-1,5-dioic acid.
- c $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ - Butanoic acid.
- d $\text{HO}_2\text{C}-\text{CO}_2\text{H}$ - Ethanedioic acid.
- e $\text{CH}_3(\text{CH}_2)_4\text{COOH}$ - Hexanoic acid.
- f $\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_2\text{COOH}$ - Hex-4-enoic acid.

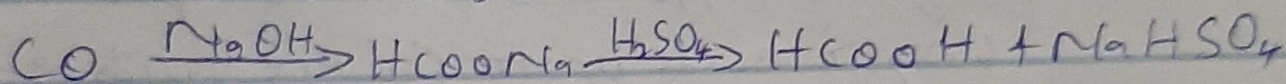
2i Physical appearance: All simple aliphatic carboxylic acids up to C_{10} are liquids at room temperature. Most other carboxylic acids are solid at room temperature although anhydrous carboxylic acid freezes to an ice-like solid below the room temperature.

ii Boiling point: Boiling point increases with increasing relative molecular mass. Aromatic carboxylic acids are crystalline solids and have higher boiling point than their aliphatic counterparts of comparable relative molecular mass.

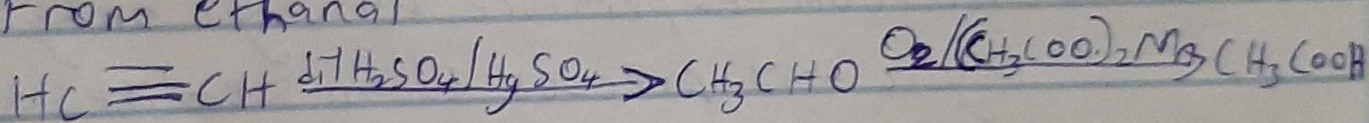
iii Solubility: Lower molecular mass carboxylic acids with up to four carbon atoms in their molecules

are soluble in water; this largely due to their ability to form hydrogen bonds with water molecules. The water solubility of the acid decreases as the relative molecular mass increases because the structure becomes relatively more hydrocarbon in nature and hence covalent.

3a From carbon (II) oxide.

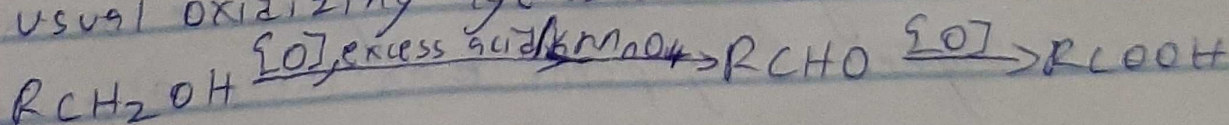


b. From ethanal



4a Oxidation of primary alcohols and aldehydes

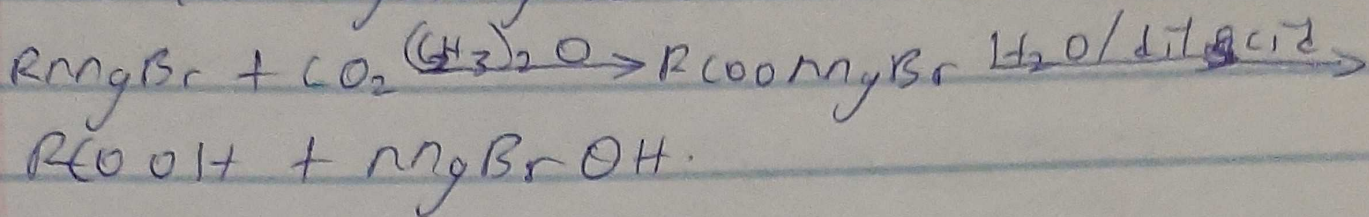
oxidation of primary alcohols and aldehydes can be used to prepare carboxylic acid using the usual oxidizing agents in acidic solution.



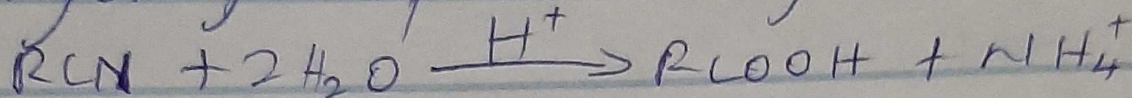
b Carbonation of Grignard reagent

Aliphatic carboxylic acids are obtained by bubbling carbon(IV) oxide into the Grignard reagent.

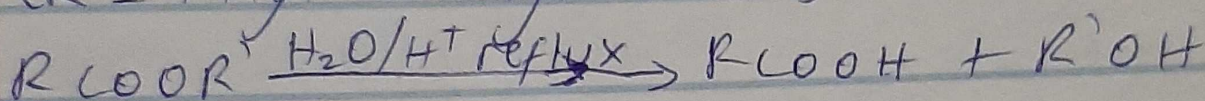
and then hydrolyzed with dilute acid.



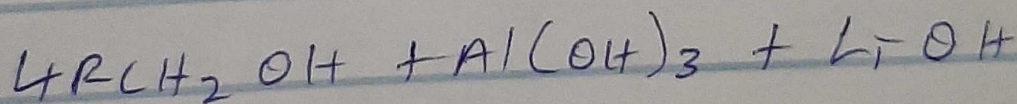
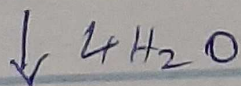
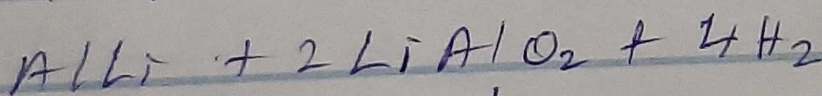
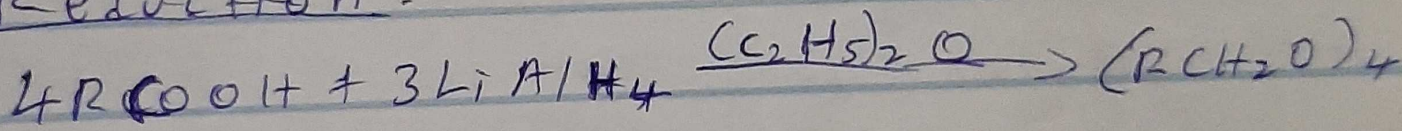
b Hydrolysis of nitrites (cyanides) or esters.



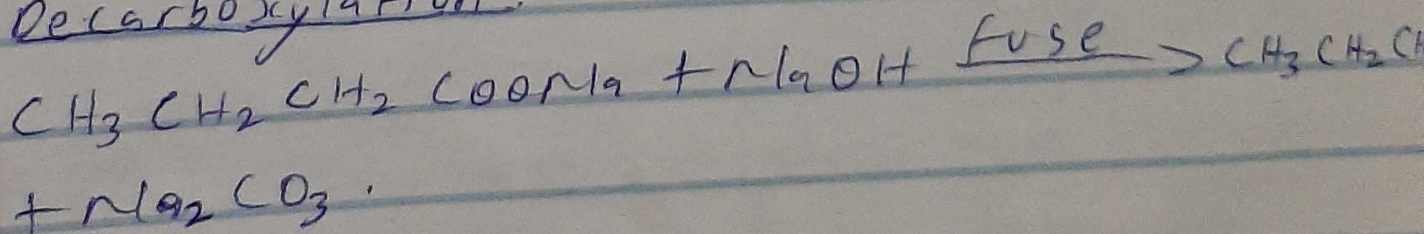
(R = alkyl or aryl radical)



5a Reduction:



b Decarboxylation:



c Esterification:

