

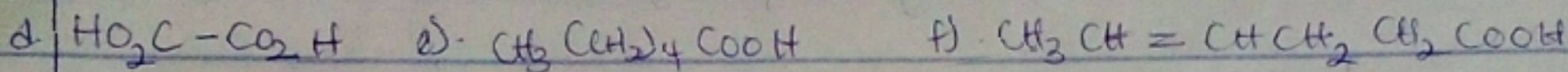
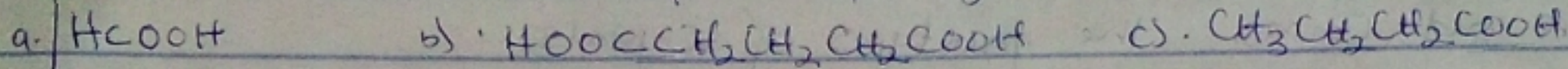
Name: Oony-Iye Eepno

Matric no: 191MHS01/357

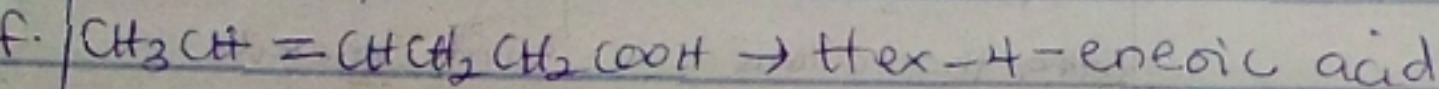
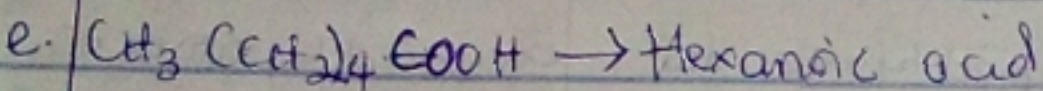
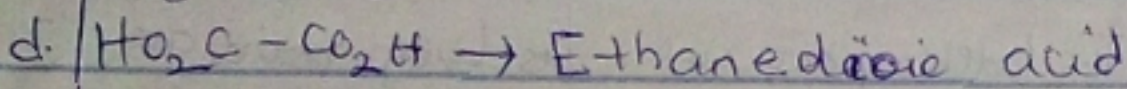
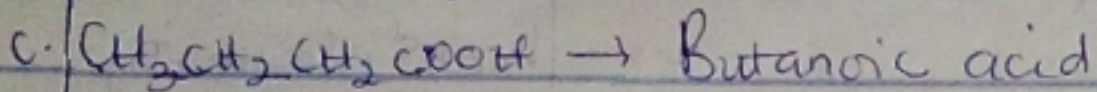
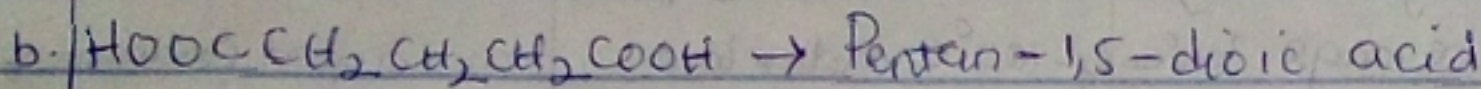
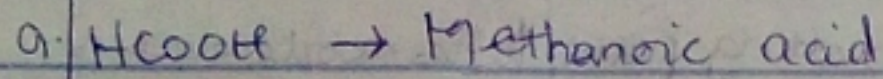
Department: Medicine & Surgery.

Course Code: CHM 102.

1. Give the IUPAC names of the following compound.



→ Answers



2. Discuss briefly the physical properties of carboxylic acid under the following heading...

a) Physical appearance b) Boiling point c) Solubility

→ Answers

a) Physical Appearance: Simple aliphatic carboxylic acids up to C_{10} are liquid at room temperature. Most are solid carboxylic acids at room temperature.

b) Boiling Point: An increase in the molecular mass brings about an increase in the boiling point. Aromatic carboxylic acids have higher melting points and they are crystalline solids.

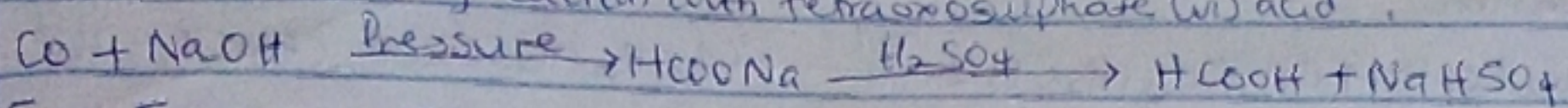
c) Solubility: Carboxylic acids with up to C_4 are soluble in water, due to their ability to form hydrogen bonds with water molecules. An increase in molecular mass brings about a decrease in solubility. All carboxylic acids are soluble in organic solvents.

3. Write two industrial preparation of carboxylic acid

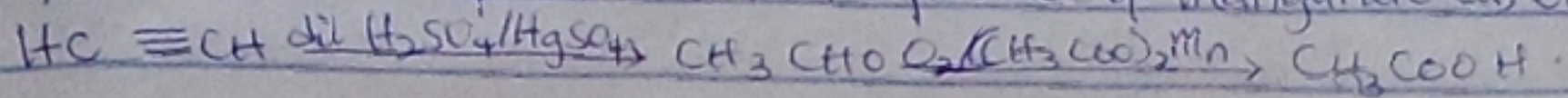
→ Answers

i) From Carbon (II) oxide: Methanoic acid is produced by adding carbon (II) oxide under pressure to hot solution of sodium hydroxide, the carboxylic acid formed is

Carefully liberated by reaction with tetraoxosulphate (VI) acid.



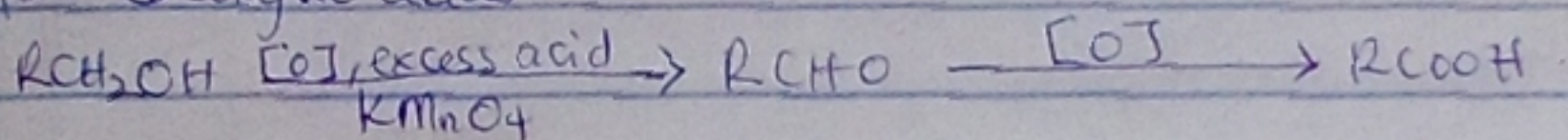
ii From Ethanal: Ethanoic acid is obtained from the liquid phase air-oxidation of 5% solution of ethanal in the presence of manganite (VI) ethanoate catalyst.



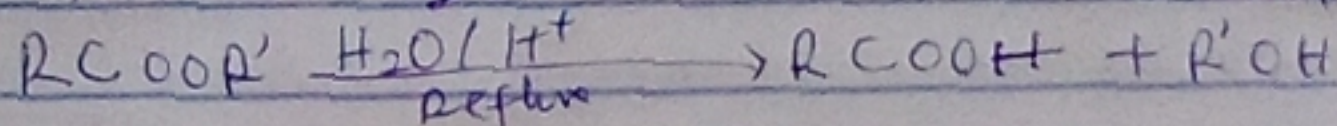
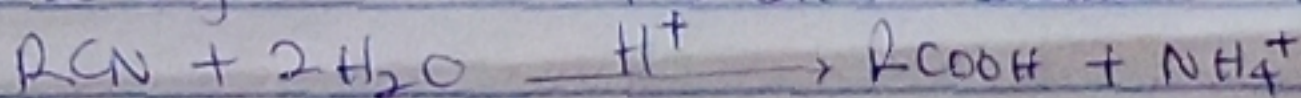
4. With equations ^{and} ~~only~~ brief explanations, discuss the systematic preparation of carboxylic acid.

→ Answers

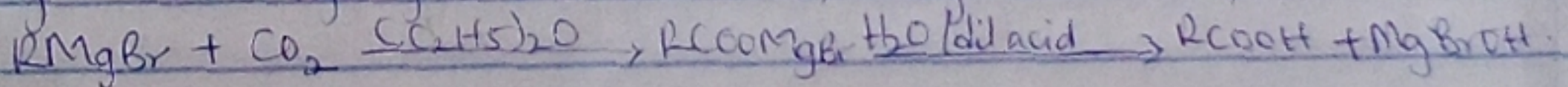
i. Oxidation of primary alcohols and aldehydes: Primary alcohols and aldehydes can be oxidized in the presence of oxidizing agent ($\text{K}_2\text{Cr}_2\text{O}_7$ / KMnO_4) in acidic solution to form carboxylic acids.



ii. Nitriles (Cyanides) or esters can be ~~oxidized~~ ^{hydrolysed} to form carboxylic acid.



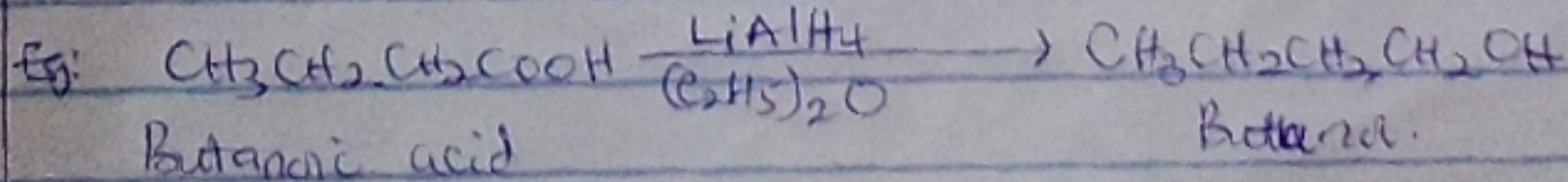
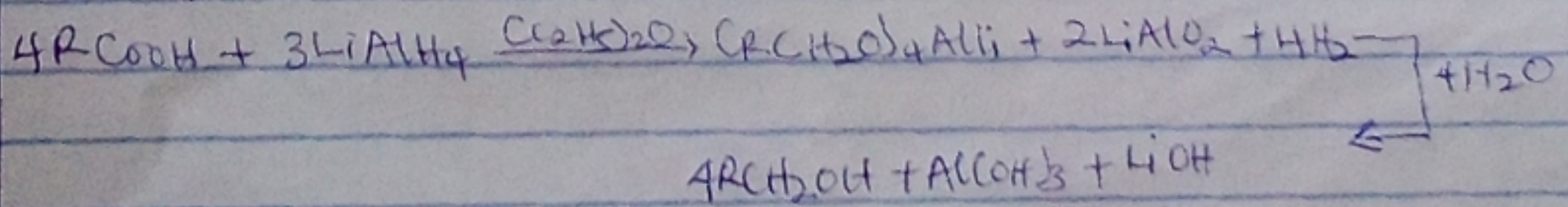
iii. Carboxylation of ^{Cuignard} ~~Cuignard~~ reagent: When carbon (II) oxide is bubbled into the Cuignard reagent and then hydrolyzed with dilute acid, carboxylic acids are formed.



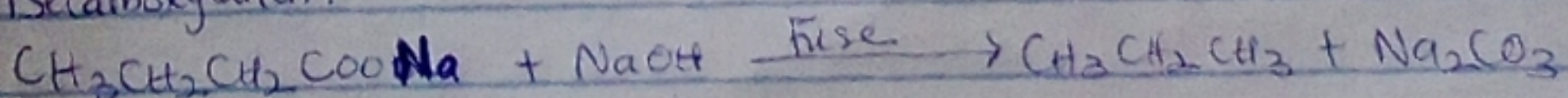
5. With chemical equations only, outline the ^{de}reduction, carbonylation and esterification of carboxylic acid.

→ Answers

i. Reduction:



ii. Decarboxylation:



iii Esterification:

