

MINISTRY OF EDUCATION
SECONDARY ENGAGEMENT PROGRAMME
GRADE 11
CHEMISTRY

WEEK 8

LESSON 2

Topic: Organic Compounds

Sub-topic: Reactions of Ethanoic Acid

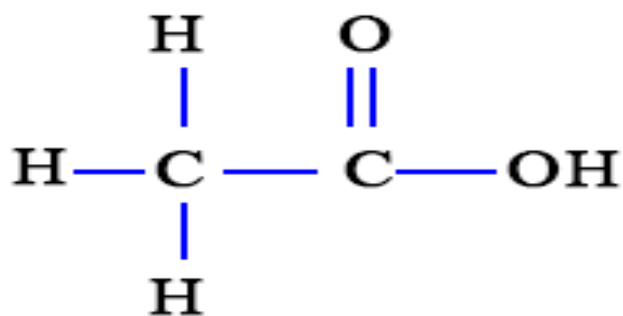
Objectives: Given equations and conditions for reactions students will predict the products for similar reactions using other members of the homologous series.

Content

When studying the carboxylic acids, ethanoic acid is usually used as a typical example of reactions. Ethanoic acid is a weak acid with only one replaceable hydrogen atom. This replaceable hydrogen is in the carboxyl functional group -COOH.

Ethanoic Acid - Molecular formula: CH_3COOH

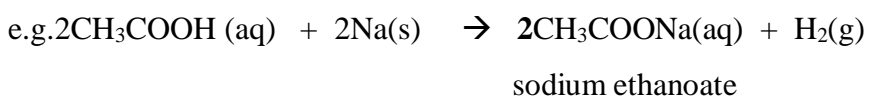
Fully displayed structural formula:



REACTIONS OF ETHANOIC ACID

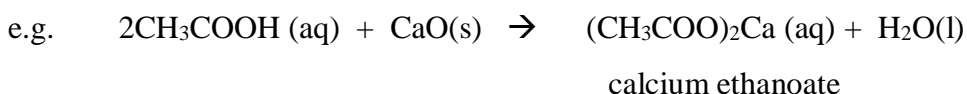
1. Reaction with metals

Ethanoic acid reacts with metals to form a salt and hydrogen gas.



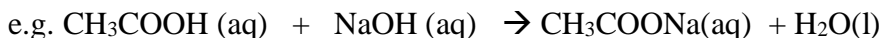
2. Reaction with metal oxides

Ethanoic acid reacts with metal oxides to form salt and water



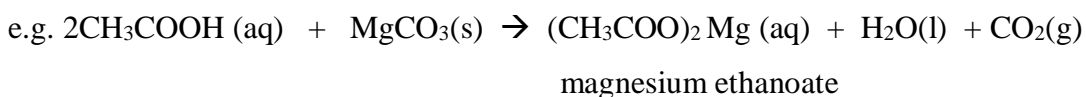
3. Reaction with hydroxides

Ethanoic acid reacts with metal hydroxides to form salt and water



4. Reaction with carbonates

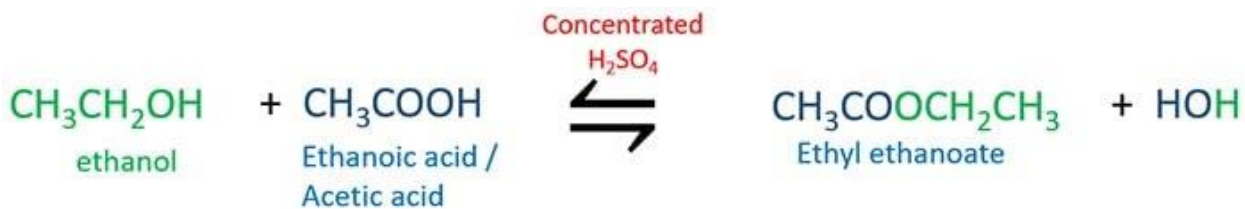
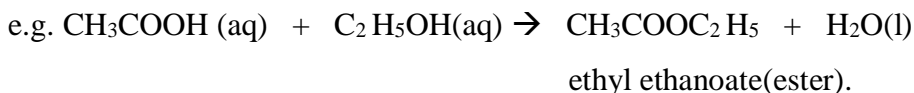
Ethanoic acid reacts with carbonates to form a salt, water and carbon dioxide.



5. Reaction with alcohols (ESTERIFICATION)

Ethanoic acid reacts with alcohols to form esters.

This reaction takes place in the presence of concentrated sulphuric acid which acts as a catalyst and dehydrating agent.



Note: the reaction is reversible.

Uses of Acetic Acid

1. Ethanoic acid is widely used in many industries.
2. Commercially it is used in the manufacturing of esters, vinegar, and many polymeric materials.
3. Vinegar has been shown to reduce high concentrations of blood sugar.
4. Used as an agent to lyse red blood cells before white blood cells are examined.
5. Used as a solvent in the production of camphor, ascent and cooking ingredient.
6. Used as a stop bath for photographic emulsion development.
7. Farmers sometimes spray acetic acid on livestock silage to fight fungal and bacterial growth.

References

<https://byjus.com/chemistry/ethanoic-acid/>

<https://sites.google.com/site/chemistryolp/what-are-carboxylic-acids>

<https://2012books.lardbucket.org/books/introduction-to-chemistry-general-organic-and-biological/s18-01-functional-groups-of-the-carbo.html>