

CAIE Chemistry IGCSE

11.7 Carboxylic acids

Flashcards

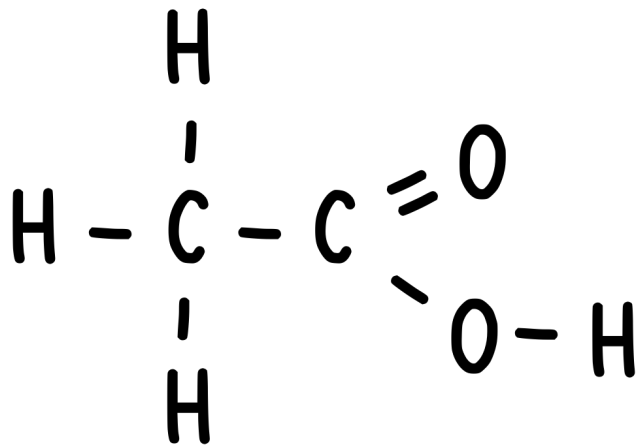
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What is the chemical formula of ethanoic acid? Draw the displayed formula



What is the chemical formula of ethanoic acid? Draw the displayed formula



What are the properties of aqueous ethanoic acid?



What are the properties of aqueous ethanoic acid?

- Colourless liquid
- Smells of vinegar



What happens when ethanoic acid reacts with metals?



What happens when ethanoic acid reacts with metals?

- Forms a salt and hydrogen gas
- The metal, above hydrogen in the reactivity series, displaces the hydrogen in ethanoic acid to form the salt.
- The name of the salt is generally: Metal ethanoate

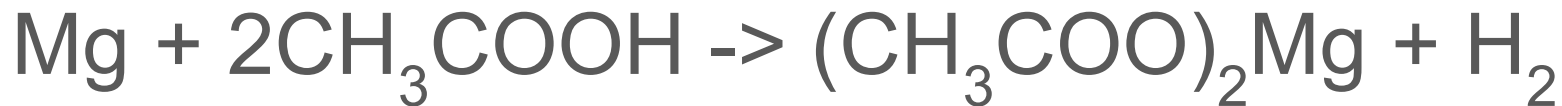


Give the word and symbol equation for the reaction between ethanoic acid and magnesium



Give the word and symbol equation for the reaction between ethanoic acid and magnesium

Magnesium + Ethanoic acid \rightarrow Magnesium ethanoate + Hydrogen



What happens when ethanoic acid reacts with a base?



What happens when ethanoic acid reacts with a base?

- Forms a salt and water
- Neutralisation reaction
- The name of the salt is generally: Metal ethanoate

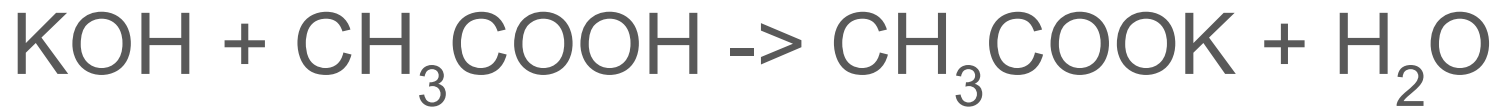


Give the word and symbol equation for the reaction between ethanoic acid and potassium hydroxide



Give the word and symbol equation for the reaction between ethanoic acid and potassium hydroxide

Potassium hydroxide + Ethanoic acid ->
Potassium ethanoate + Water



What happens when ethanoic acid reacts with carbonates?



What happens when ethanoic acid reacts with carbonates?

- Forms a salt, carbon dioxide and water
- The name of the salt is generally: Metal ethanoate

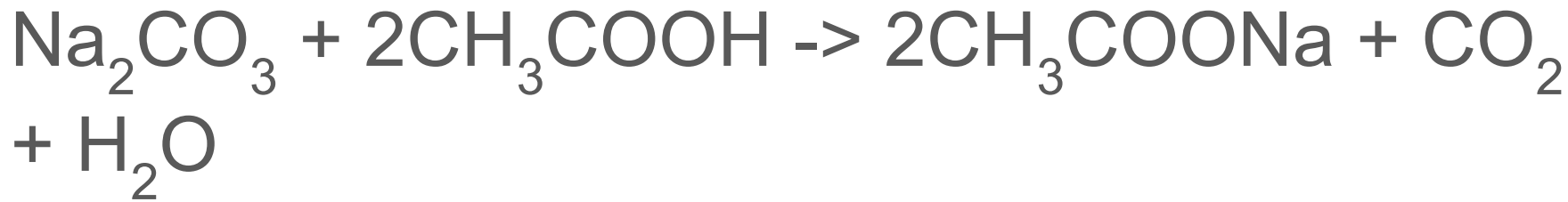


Give the word and symbol equation for the reaction between ethanoic acid and sodium carbonate



Give the word and symbol equation for the reaction between ethanoic acid and sodium carbonate

Sodium carbonate + Ethanoic acid → Sodium ethanoate + Carbon dioxide + Water



How can ethanoic acid be made from ethanol?

(extended only)



How can ethanoic acid be made from ethanol? (extended only)

Ethanol can be oxidised in two different ways to form ethanoic acid:

- Microbial oxidation (ethanol reacts with oxygen in the air to form ethanoic acid).
- Ethanol reacts with acidified potassium manganate(VII) to form ethanoic acid.



Describe how ethanoic acid is formed
from the oxidation of ethanol with
acidified potassium manganate (VII)
(extended only)



Describe how ethanoic acid is formed from the oxidation of ethanol with acidified potassium manganate (VII) (**extended only**)

- Ethanol is heated with acidified potassium manganate(VII) to form ethanoic acid in an oxidation reaction, with an acid catalyst.
- Solution: from purple to colourless
- Done under reflux (heated with a condenser upright)



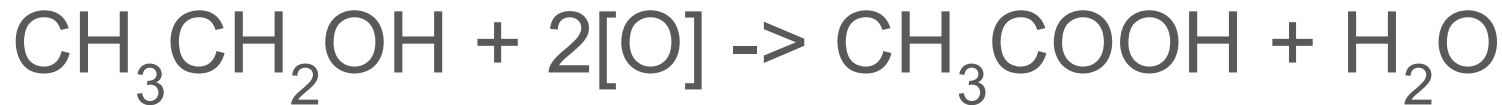
Give the equation for the oxidation of ethanol with acidified potassium manganate (VII)
(extended only)



Give the equation for the oxidation of ethanol with acidified potassium manganate (VII) (extended only)

- Acidified aqueous potassium manganate(VII) is an oxidising agent and is represented in equations as [O]

- The chemical equation for this reaction is:



Describe how ethanoic acid is formed
from bacterial oxidation
(extended only)



Describe how ethanoic acid is formed from the oxidation of ethanol from bacterial oxidation
(extended only)

- This reaction occurs when a wine bottle (ethanol is in wine) is left open.
- Bacteria in the air will use atmospheric oxygen to oxidise ethanol, producing a weak solution of ethanoic acid (vinegar) over time.



Give the equation for the oxidation of ethanol by bacterial oxidation
(extended only)



Give the equation for the oxidation of ethanol by bacterial oxidation (**extended only**)

- The chemical equation for this reaction is:
$$\text{CH}_3\text{CH}_2\text{OH} + \text{O}_2 \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$$



How is an ester formed? (extended only)



How is an ester formed? (extended only)

A carboxylic acid reacts with an alcohol in the presence of an acid catalyst.



How are esters named? (extended only)



How are esters named? (extended only)

- First name comes from the alcohol.
- Second name comes from the carboxylic acid.
- E.g. Propanoic acid and ethanol makes ethyl propanoate.



Give the general equation for when a
carboxylic acid reacts with an alcohol
(extended only)



Give the general equation for when a carboxylic acid reacts with an alcohol (**extended only**)

Carboxylic acid + Alcohol \rightleftharpoons Ester + Water

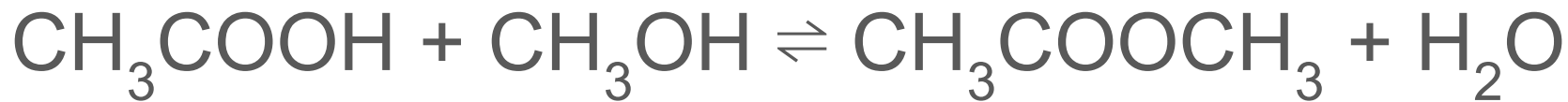


Give the word and symbol equation for
when ethanoic acid reacts with methanol
(extended only)



Give the word and symbol equation for when ethanoic acid reacts with methanol (**extended only**)

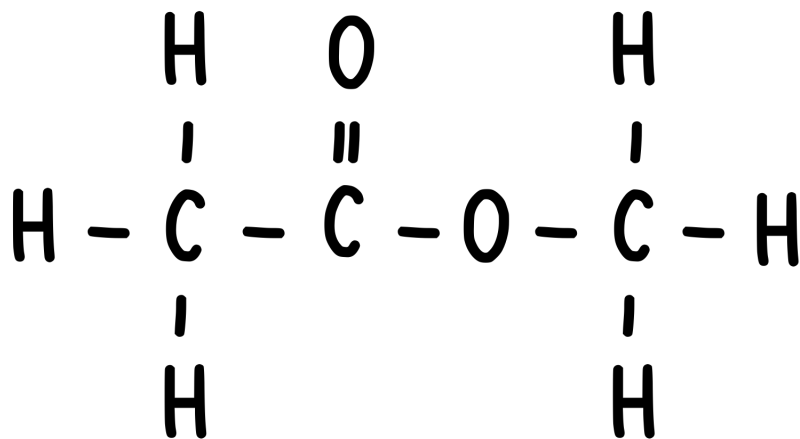
Ethanoic acid + Methanol \rightleftharpoons Methyl ethanoate
+ Water



Draw the displayed formula of the ester
produced when ethanoic acid reacts with
methanol
(extended only)



Draw the displayed formula of the ester produced when ethanoic acid reacts with methanol (**extended only**)



methyl ethanoate

