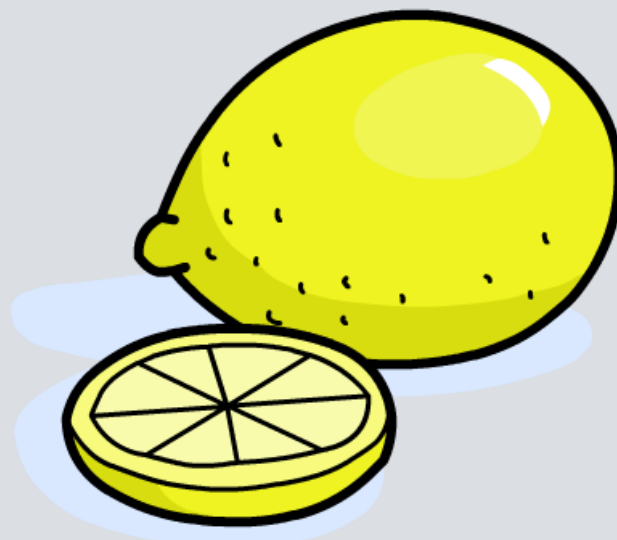
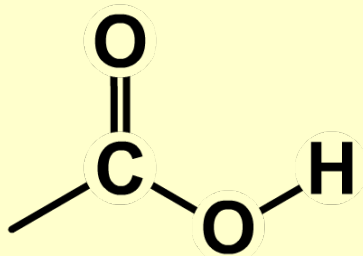


Carboxylic Acids



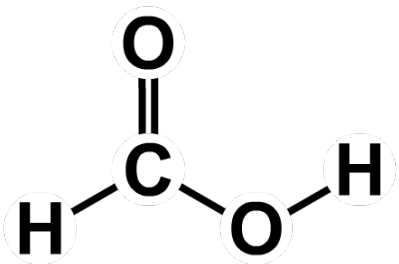
What are carboxylic acids?

Carboxylic acids contain a **functional group** of carbon, hydrogen and oxygen atoms arranged like this...

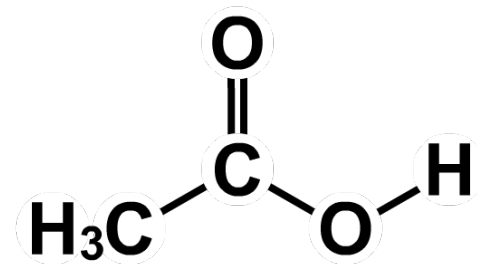


...which is written as -COOH .

E.g.



methanoic acid (HCOOH)



ethanoic acid (CH_3COOH)

What do you think the carboxylic acid with three carbon atoms is called?



Naming carboxylic acids

Match the acids to their formula

pentanoic acid

CH_3COOH

methanoic acid

$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{COOH}$

butanoic acid

$\text{CH}_3\text{CH}_2\text{COOH}$

propanoic acid

HCOOH

ethanoic acid

$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{COOH}$

hexanoic acid

$\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$

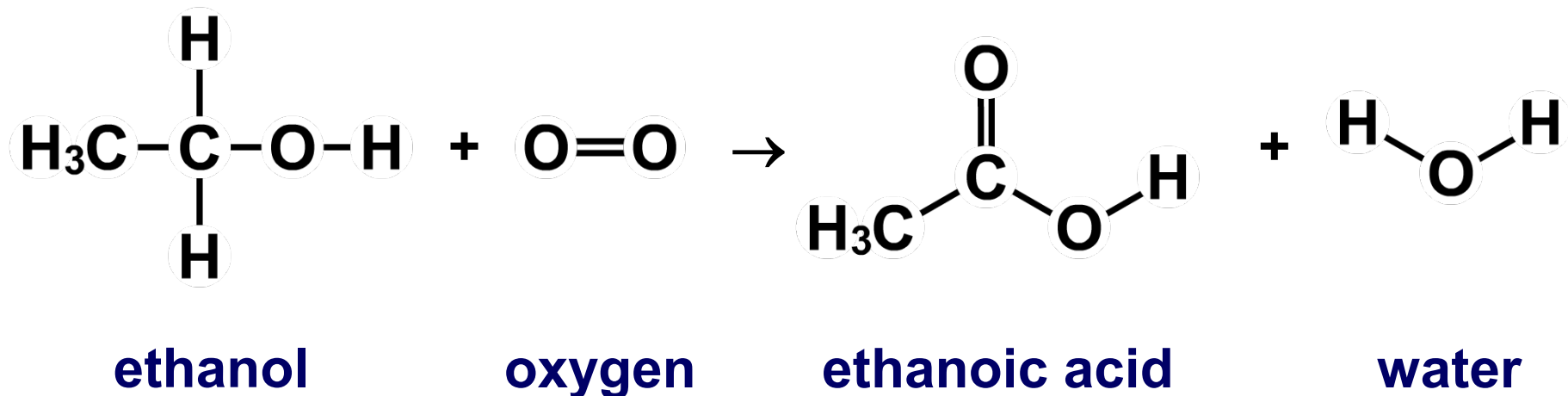
?

solve



Making carboxylic acids

If you leave wine standing open to the air, oxygen from the air will oxidize the ethanol to ethanoic acid, forming vinegar.



In fact, any carboxylic acid can be made by **oxidizing** the corresponding alcohol.

- Q)** Which carboxylic acid is made when methanol is oxidized?
- A)** Methanoic acid.



Carboxylic acids:

- have relatively high melting and boiling points
- are very soluble in water
- are weak acids
- have a characteristic smell!



Examples of everyday carboxylic acids include:

- citric acid (found in citrus fruits)
- lactic acid (found in tired muscles)
- malic acid (found in sour and tart foods).



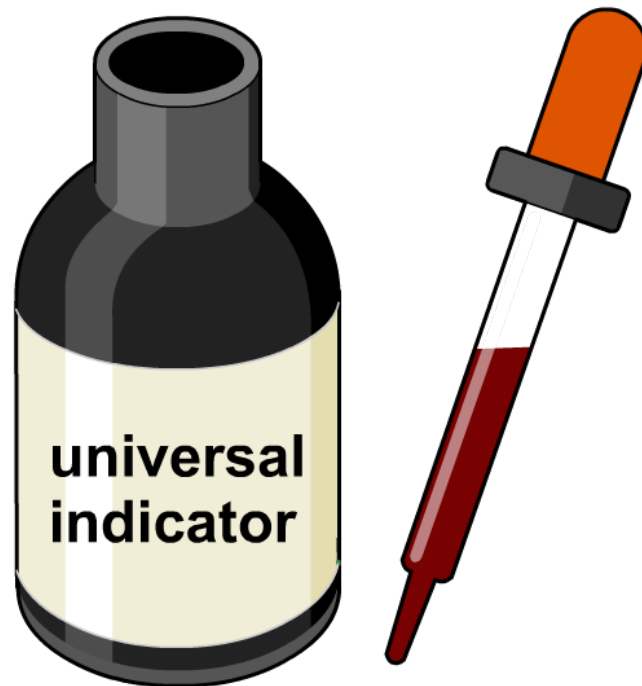
Match the properties



Carboxylic acids are typical **weak acids**.

What would happen if you added a few cm^3 of dilute ethanoic acid to each of these substances?

- A few drops of universal indicator.
- 3 cm^3 sodium hydroxide solution.
- Half a spatula of sodium carbonate.
- A piece of magnesium ribbon.





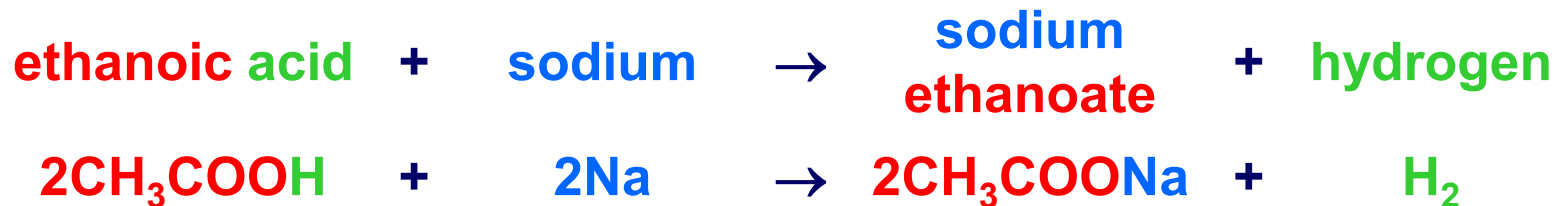
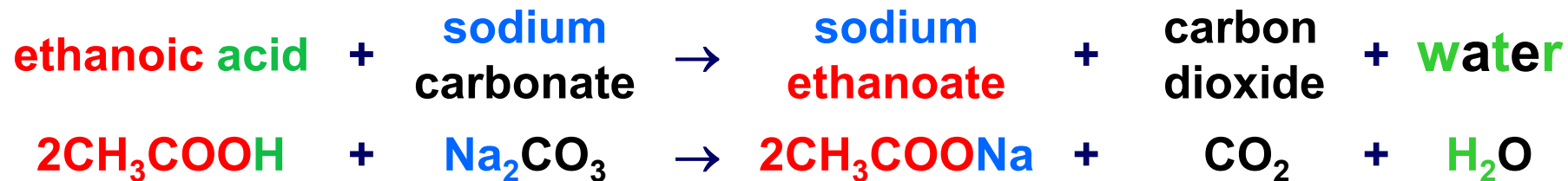
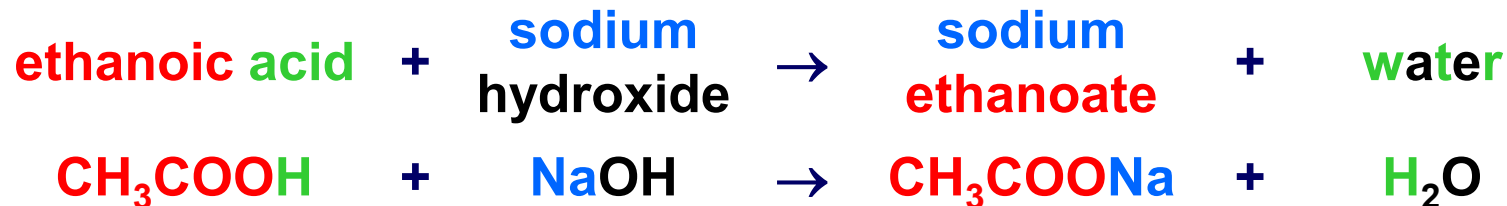
Chemical properties of carboxylic acids

Substance added	Observation	Explanation
A few drops of universal indicator	Indicator turns yellow-orange	click to reveal
3 cm ³ sodium hydroxide solution	No observable reaction	click to reveal
Half a spatula of sodium carbonate	Carbon dioxide gas produced	click to reveal
A piece of magnesium ribbon	Hydrogen gas produced	click to reveal

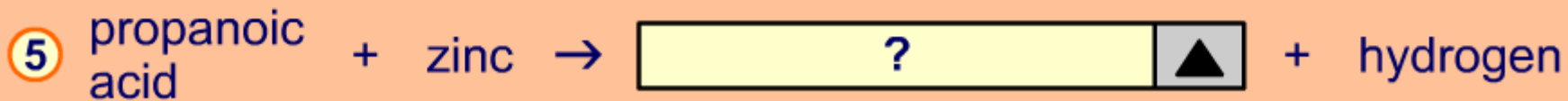
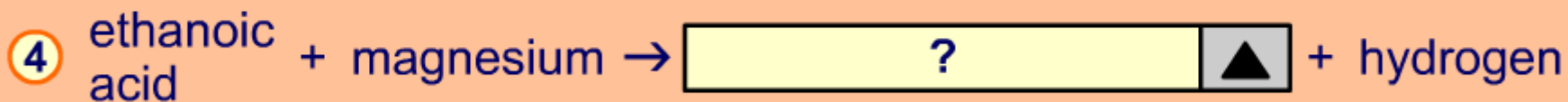
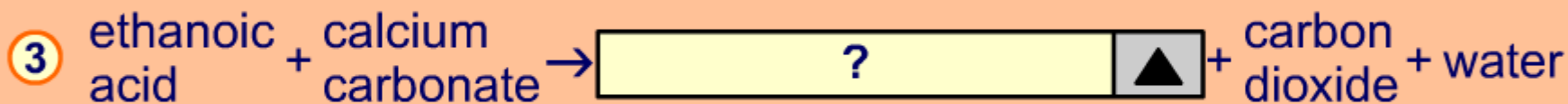
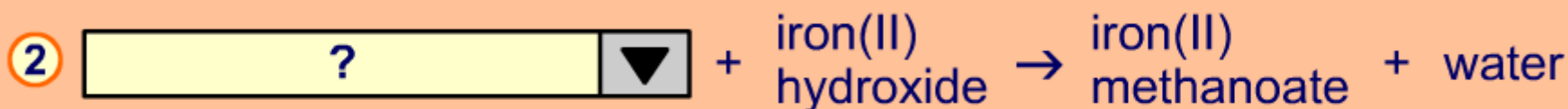
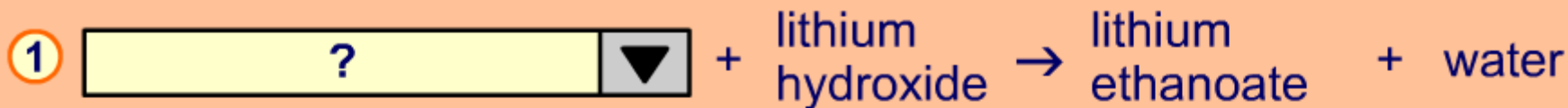


Reactions of carboxylic acids

Carboxylic acids react like any other type of acid, forming salts when they react with alkalis, carbonates and metals:



Carboxylic acids: complete these reactions



?

C

solve

↺

Complete the equation

Select the correct formulae to complete the following series of equations.

Click "**start**" to begin.

start

