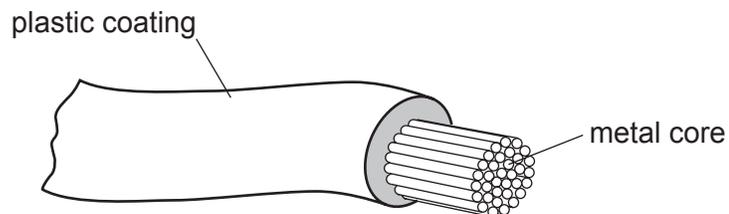
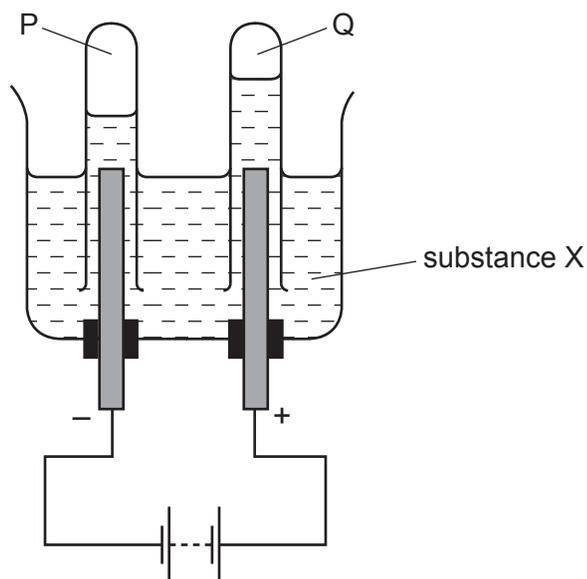


- 1 The diagram shows an electrical cable.



Which statement about the substances used is correct?

- A** The coating is plastic because it conducts electricity well.
 - B** The core is copper because it conducts electricity well.
 - C** The core is copper because it is cheap and strong.
 - D** The core is iron because it is cheap and strong.
- 2 When substance X is electrolysed, the amount of gases P and Q formed is shown.



What is substance X?

- A** concentrated aqueous sodium chloride
- B** concentrated hydrochloric acid
- C** dilute sulfuric acid
- D** molten lead(II) bromide

- 3 What are the products at the electrodes when dilute sulfuric acid is electrolysed using inert electrodes?

	anode	cathode
A	hydrogen	oxygen
B	oxygen	hydrogen
C	sulfur	oxygen
D	sulfur dioxide	hydrogen

- 4 Electricity is passed separately through concentrated hydrochloric acid, concentrated aqueous sodium chloride and dilute sulfuric acid.

In which rows are the electrolysis products correctly named?

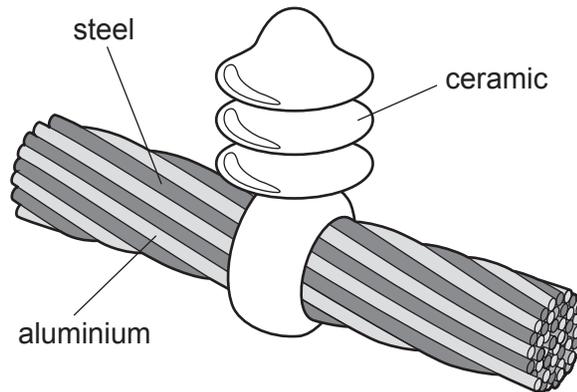
		cathode product	anode product
1	concentrated hydrochloric acid	hydrogen	chlorine
2	concentrated aqueous sodium chloride	sodium	chlorine
3	dilute sulfuric acid	hydrogen	oxygen

- A** 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

- 5 Which row describes the electrolysis of molten potassium bromide?

	product at anode	product at cathode
A	bromine	hydrogen
B	bromine	potassium
C	hydrogen	bromine
D	potassium	bromine

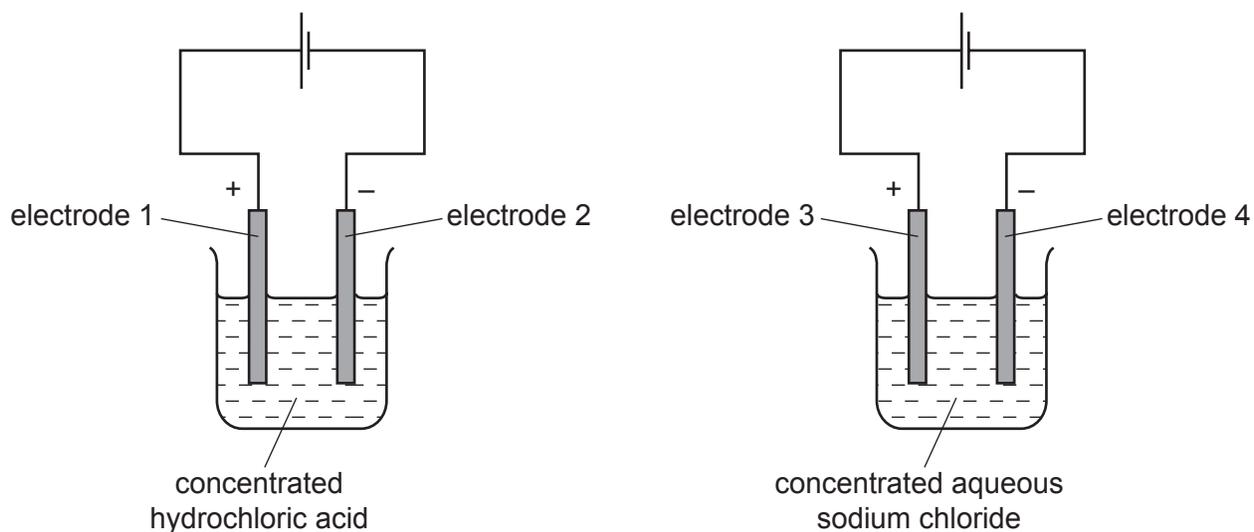
6 The diagram shows a section of an overhead power cable.



Which statement explains why a particular substance is used?

- A** Aluminium has a low density and is a good conductor of electricity.
- B** Ceramic is a good conductor of electricity.
- C** Steel can rust in damp air.
- D** Steel is more dense than aluminium.

- 7 The diagram shows the electrolysis of concentrated hydrochloric acid and concentrated aqueous sodium chloride using carbon electrodes.



At which electrode(s) is hydrogen produced?

- A** electrode 1 only
B electrodes 1 and 3
C electrode 2 only
D electrodes 2 and 4
- 8 What are the electrode products when molten silver iodide is electrolysed between inert electrodes?

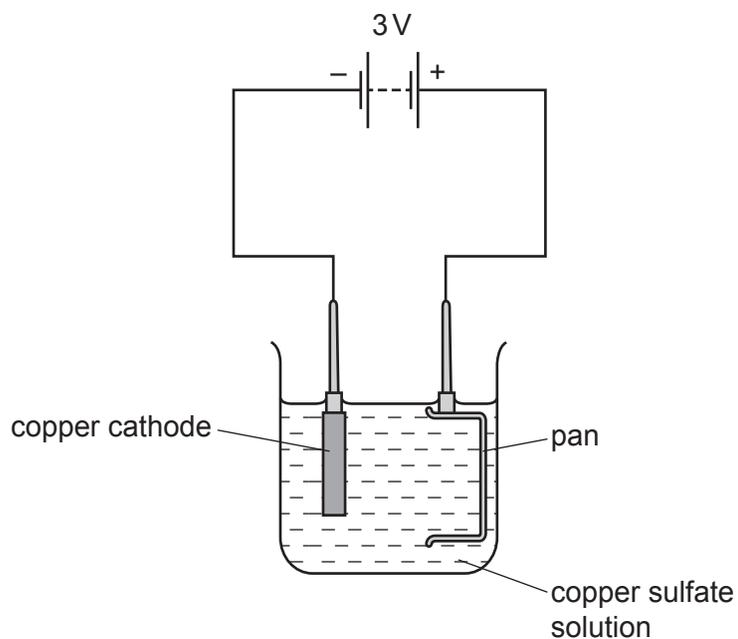
	cathode	anode
A	hydrogen	iodine
B	iodine	silver
C	silver	iodine
D	silver	oxygen

9 Copper and hydrogen can each be formed by electrolysis.

At which electrodes are these elements formed?

	copper	hydrogen
A	anode	anode
B	anode	cathode
C	cathode	anode
D	cathode	cathode

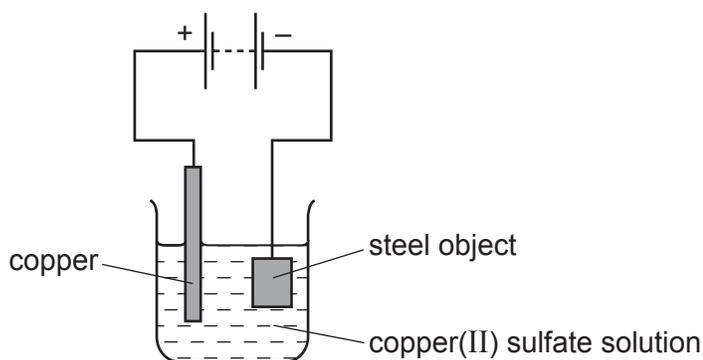
10 The diagram shows a failed attempt to copper-plate a pan.



Which action will plate the pan with copper?

- A** cooling the copper sulfate solution in an ice bath
- B** heating the copper sulfate solution to boiling point
- C** increasing the voltage from 3V to 6V
- D** making the pan the cathode and the copper the anode

11 The diagram shows the electroplating of a steel object.



A student made the following statements.

- 1 The object turns a reddish-brown colour.
- 2 The copper sulfate solution changes to a paler blue colour.
- 3 The copper electrode becomes smaller.

Which statements are correct?

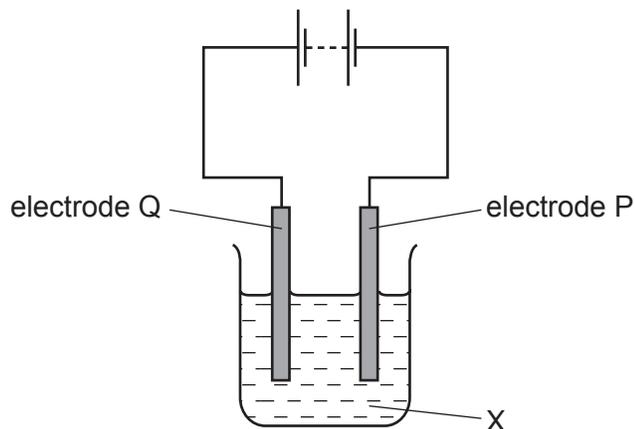
- A** 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

12 An object is electroplated with silver using an aqueous silver salt as the electrolyte.

Which set of conditions is used?

	the object to be electroplated is the	the other electrode is made from
A	anode	carbon
B	anode	silver
C	cathode	carbon
D	cathode	silver

13 The diagram shows an electrolysis experiment.

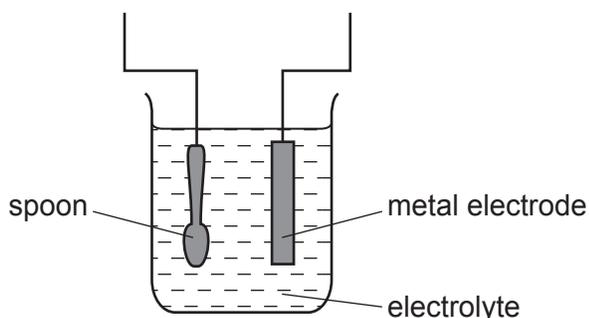


During the electrolysis, sodium was formed at electrode P and chlorine at electrode Q.

Which row correctly identifies P, Q and X?

	P	Q	X
A	anode	cathode	concentrated solution of sodium chloride in water
B	anode	cathode	molten sodium chloride
C	cathode	anode	concentrated solution of sodium chloride in water
D	cathode	anode	molten sodium chloride

14 The diagram shows apparatus for plating a spoon with silver.



Which statement is **not** correct?

- A** Silver would stick to the spoon because it is a very reactive metal.
- B** The electrolyte would be a silver salt dissolved in water.
- C** The metal electrode would be made from silver.

D The spoon would be connected to the negative terminal of the power supply.

15 Which metal could **not** be used for electroplating by using an aqueous solution?

- A chromium
- B copper
- C silver
- D sodium

16 Which products are formed at the electrodes when a concentrated solution of sodium chloride is electrolysed?

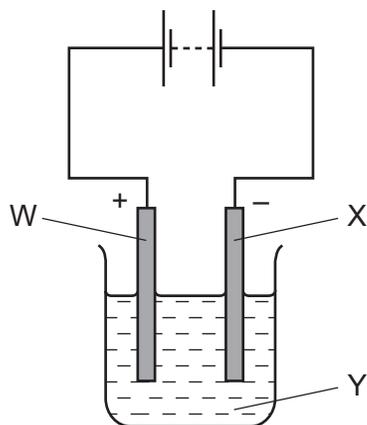
	cathode (-)	anode (+)
A	hydrogen	chlorine
B	hydrogen	oxygen
C	sodium	chlorine
D	sodium	oxygen

17 A student wishes to electroplate an object with copper.

Which row is correct?

	object is made the	a suitable electrolyte is
A	anode	CuO(s)
B	anode	CuSO ₄ (aq)
C	cathode	CuO(s)
D	cathode	CuSO ₄ (aq)

18 In the electrolysis shown, chlorine is produced at W and sodium at X.



Which labels are correct?

	W	X	Y
A	anode	cathode	$\text{NaCl}(\text{l})$
B	anode	cathode	$\text{NaCl}(\text{aq})$
C	cathode	anode	$\text{NaCl}(\text{l})$
D	cathode	anode	$\text{NaCl}(\text{aq})$

19 Which substance will **not** conduct electricity?

- A** aluminium
- B** copper
- C** plastic
- D** steel

20 Which products are formed at the anode and cathode when electricity is passed through molten lead(II) bromide?

	anode (+)	cathode (-)
A	bromide ions	lead ions
B	bromine molecules	lead atoms
C	lead atoms	bromine molecules
D	lead ions	bromide ions

21 Electrical cables are made from either1....., because it is a very good conductor of electricity, or from.....2....., because it has a low density. Overhead cables have a3..... core in order to give the cable strength.

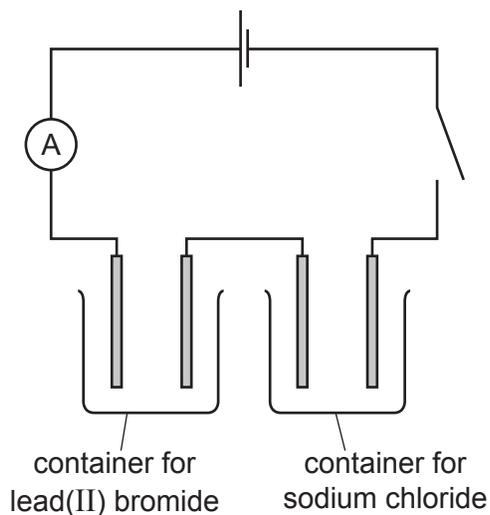
Which words correctly complete gaps 1, 2 and 3?

	1	2	3
A	aluminium	copper	magnesium
B	copper	aluminium	magnesium
C	copper	aluminium	steel
D	magnesium	copper	steel

22 What will be produced at the anode and at the cathode, if molten potassium chloride is electrolysed?

	anode (+)	cathode (-)
A	chlorine	hydrogen
B	chlorine	potassium
C	hydrogen	chlorine
D	potassium	chlorine

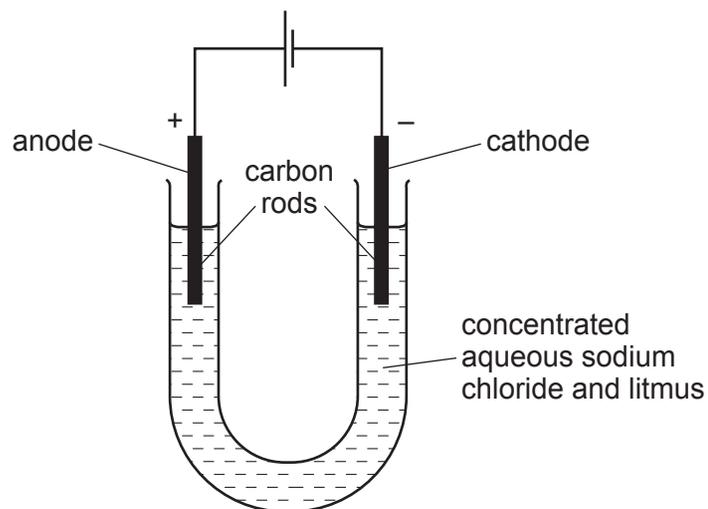
- 23 The diagram shows the circuit for electrolysis of lead(II) bromide and sodium chloride to liberate the metal.



In what form are these salts electrolysed for liberating the metal?

	lead(II) bromide	sodium chloride
A	concentrated solution	concentrated solution
B	concentrated solution	molten
C	molten	concentrated solution
D	molten	molten

24 The diagram shows the electrolysis of concentrated aqueous sodium chloride.

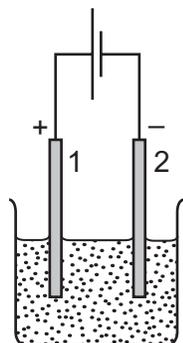


What is the colour of the litmus at each electrode after five minutes?

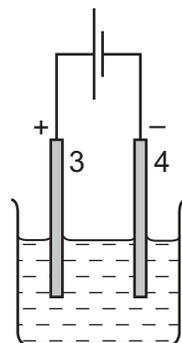
	colour at anode	colour at cathode
A	blue	red
B	red	blue
C	red	colourless
D	colourless	blue

25 Two electrolysis experiments were carried out as shown in the diagram below.

The graphite electrodes are labelled 1-4.



molten sodium chloride



concentrated aqueous sodium chloride

Which row describes the products at the electrodes in these experiments?

	electrode 1	electrode 2	electrode 3	electrode 4
A	chlorine	hydrogen	chlorine	hydrogen
B	chlorine	sodium	chlorine	hydrogen
C	chlorine	sodium	hydrogen	chlorine
D	sodium	chlorine	sodium	chlorine

26 One molten compound and two aqueous solutions were electrolysed.

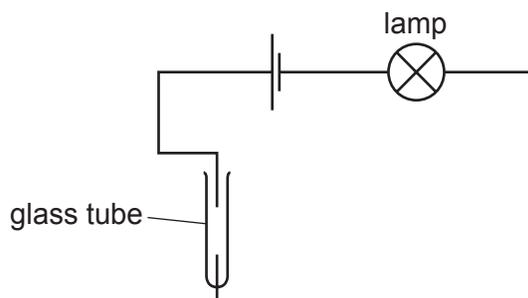
The table gives the compounds electrolysed and the electrodes used.

	substance electrolysed	electrodes
1	concentrated hydrochloric acid	carbon
2	concentrated sodium chloride	platinum
3	molten lead bromide	platinum

In which experiments is a gas evolved at the cathode?

- A** 1, 2 and 3 **B** 1 and 2 only **C** 1 only **D** 3 only

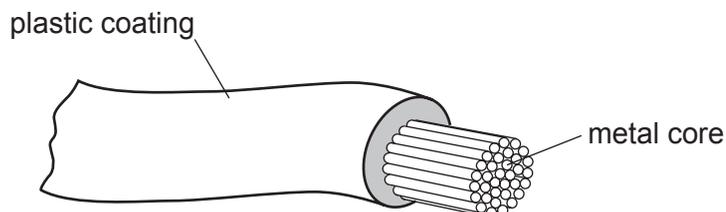
27 The diagram shows an incomplete circuit.



Which substance causes the lamp to light when added to the glass tube?

- A** aqueous sodium chloride
- B** aqueous sugar
- C** solid sodium chloride
- D** solid sugar

28 The diagram shows an electrical cable.

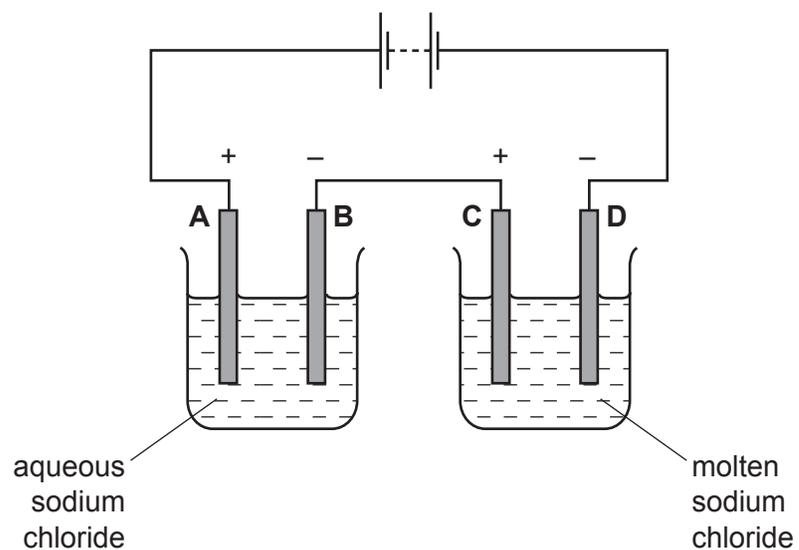


Which statement about the substances used is correct?

- A** The coating is plastic because it conducts electricity well.
- B** The core is copper because it conducts electricity well.
- C** The core is copper because it is cheap and strong.
- D** The core is iron because it is cheap and strong.

29 The diagram shows an electrolysis circuit.

At which electrode is hydrogen formed?

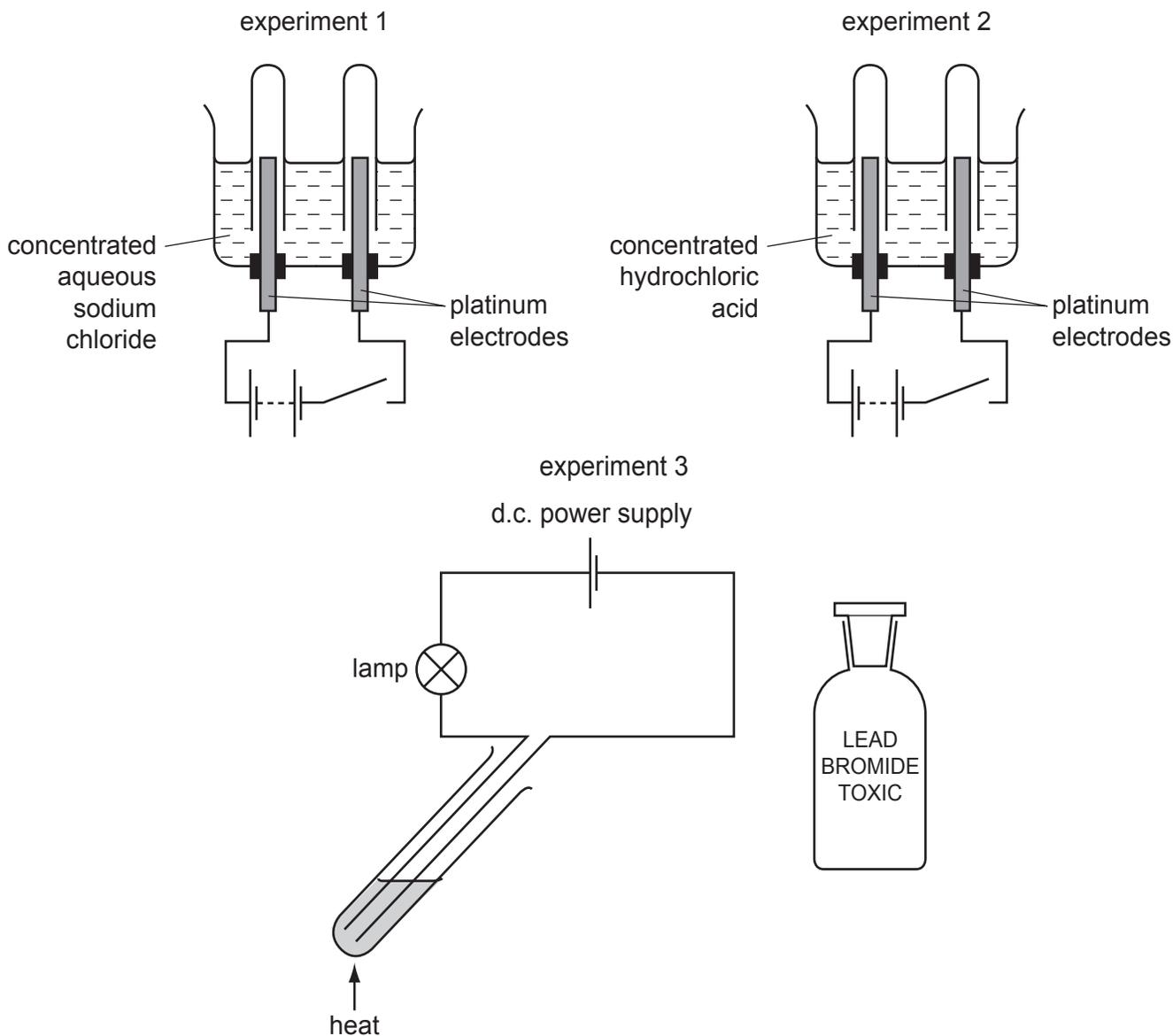


30 Some white anhydrous copper(II) sulfate powder is put into a beaker of water and stirred.

What would show that the process was exothermic?

- A** A blue solution is formed.
- B** The beaker feels cooler.
- C** The beaker feels warmer.
- D** The powder dissolves in the water.

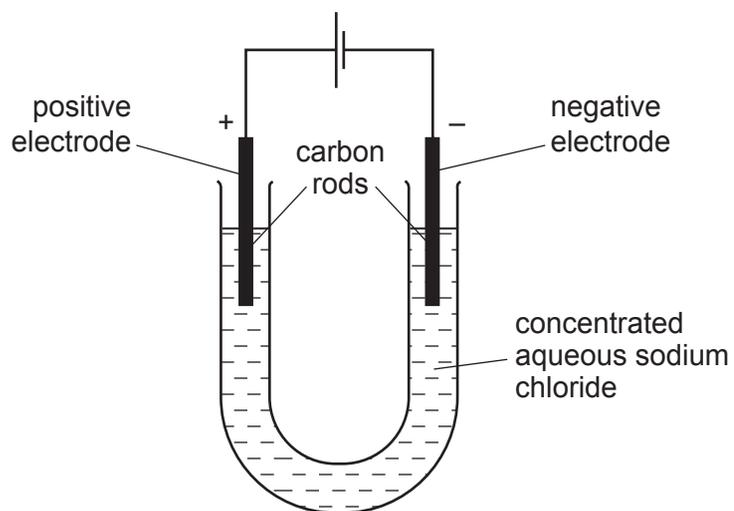
31 Concentrated aqueous sodium chloride, concentrated hydrochloric acid and molten lead bromide were separately electrolysed in experiments 1, 2 and 3.



Which statement about the electrode products is correct?

- A Gases were given off at the anode in experiments 2 and 3 only.
- B Gases were given off at the cathode in experiments 1 and 2 only.
- C Metals were formed at the anode in experiments 1 and 3 only.
- D Metals were formed at the cathode in experiments 1 and 3 only.

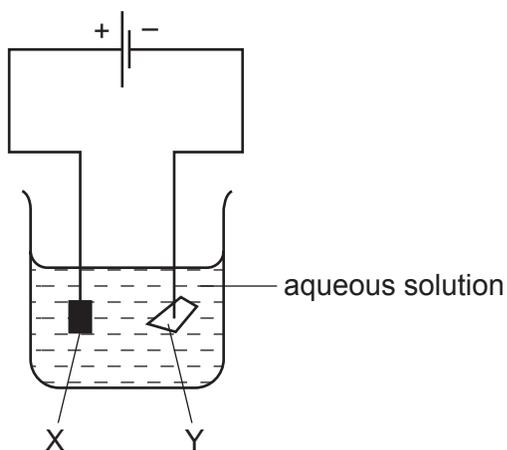
32 The diagram shows the electrolysis of concentrated aqueous sodium chloride.



What is produced at each of the electrodes?

	product at cathode	product at anode
A	hydrogen	chlorine
B	hydrogen	oxygen
C	sodium	chlorine
D	sodium	oxygen

33 The diagram shows an electrolysis experiment using metals X and Y as electrodes.



One of the metals becomes coated with copper.

Which metal becomes coated and which aqueous solution is used?

	metal	aqueous solution
A	X	Cr l_3
B	X	Cu l_2
C	Y	Cr l_3
D	Y	Cu l_2

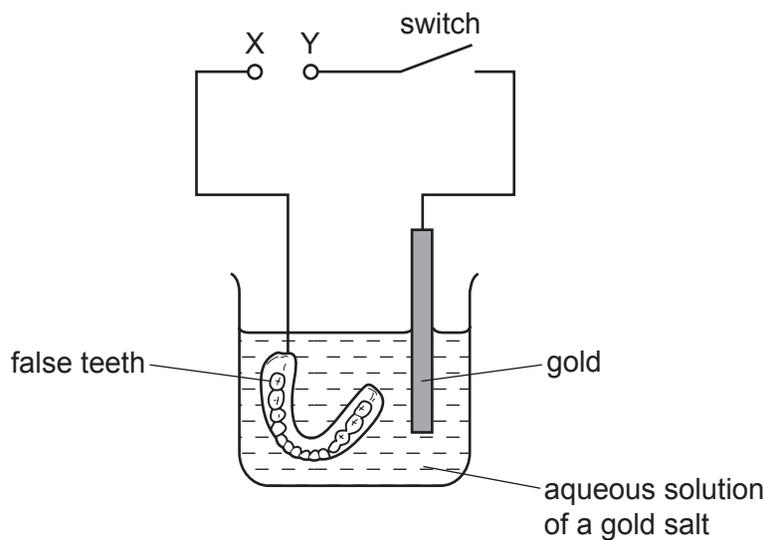
34 In separate experiments, electricity was passed through concentrated aqueous sodium chloride and molten lead bromide.

What would happen in **both** experiments?

- A** A halogen would be formed at the anode.
- B** A metal would be formed at the cathode.
- C** Hydrogen would be formed at the anode.
- D** Hydrogen would be formed at the cathode.

35 Winston Churchill, a British Prime Minister, had his false teeth electroplated with gold.

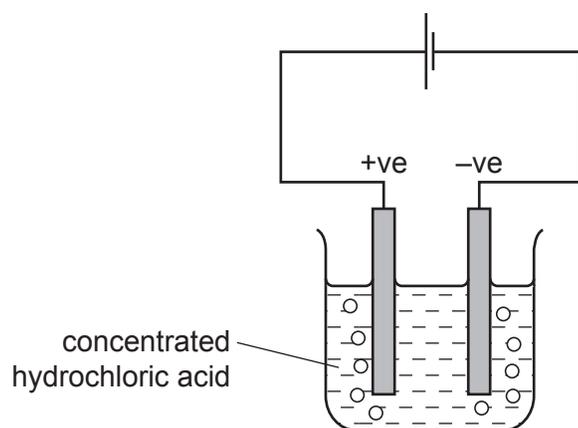
The teeth were coated with a thin layer of carbon and were then placed in the apparatus shown.



Which row is correct?

	terminal X is	the carbon powder could be
A	negative	diamond
B	negative	graphite
C	positive	diamond
D	positive	graphite

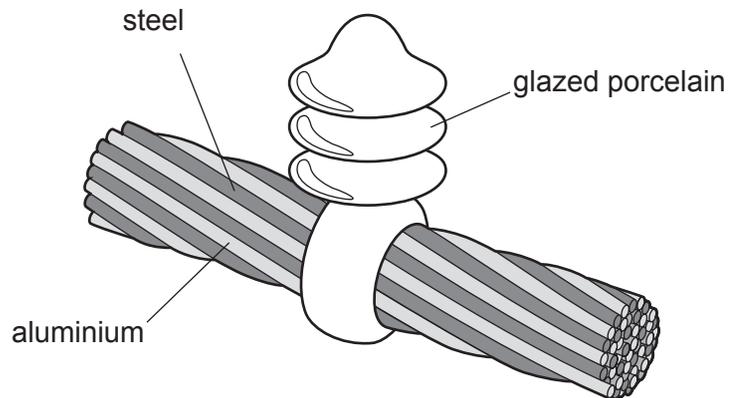
- 36 The diagram shows that two gases are formed when concentrated hydrochloric acid is electrolysed using inert electrodes.



Which row correctly describes the colours of the gases at the electrodes?

	anode (+ve)	cathode (-ve)
A	colourless	colourless
B	colourless	yellow-green
C	yellow-green	colourless
D	yellow-green	yellow-green

37 The diagram shows a section of an overhead power cable.



Which statement explains why a particular substance is used?

- A** Aluminium has a low density and is a good conductor of electricity.
- B** Porcelain is a good conductor of electricity.
- C** Steel can rust in damp air.
- D** Steel is more dense than aluminium.

38 Metals could be extracted from their molten chlorides using electrolysis.

Which substances are formed at each electrode?

	anode	cathode
A	chlorine	hydrogen
B	chlorine	metal
C	hydrogen	metal
D	metal	chlorine

39 Concentrated aqueous potassium bromide solution is electrolysed using inert electrodes.

The ions present in the solution are K^+ , Br^- , H^+ and OH^- .

To which electrodes are the ions attracted during this electrolysis?

	attracted to anode	attracted to cathode
A	Br^- and K^+	H^+ and OH^-
B	Br^- and OH^-	H^+ and K^+
C	H^+ and K^+	Br^- and OH^-
D	H^+ and OH^-	Br^- and K^+

40 Electricity from a power station passes through overhead cables to a substation and then to a school where it is used to electrolyse concentrated hydrochloric acid using inert electrodes.

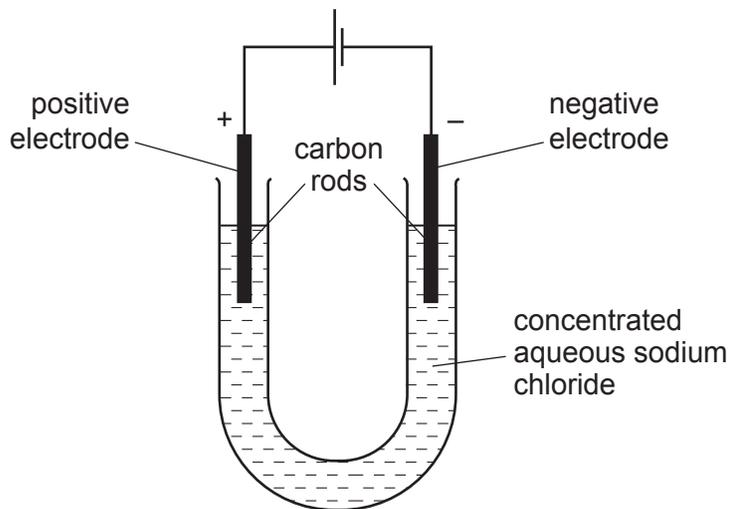
Which substances are used for the overhead cables and for the electrodes?

	overhead cables	electrodes
A	aluminium	copper
B	aluminium	platinum
C	copper	platinum
D	platinum	aluminium

41 Which statement about the electrolysis of molten lead(II) bromide is correct?

- A** A colourless gas is seen at the cathode.
- B** A grey metal is seen at the anode.
- C** A red/brown gas is seen at the anode.
- D** A red/brown metal is seen at the cathode.

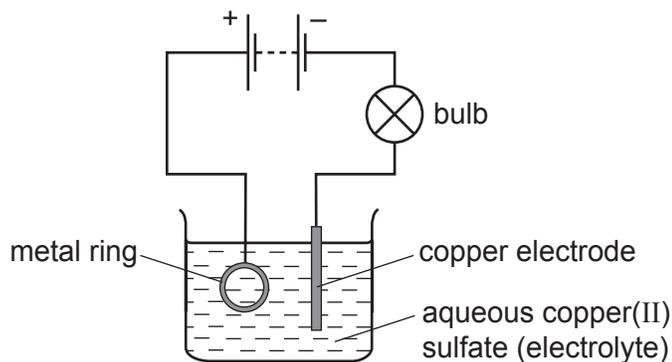
42 Electricity is passed through concentrated aqueous sodium chloride, as shown.



What is the test for the gas formed at the positive electrode?

- A bleaches damp litmus paper
- B 'pops' with a lighted splint
- C relights a glowing splint
- D turns damp red litmus paper blue

43 The diagram shows apparatus used in an attempt to electroplate a metal ring with copper.

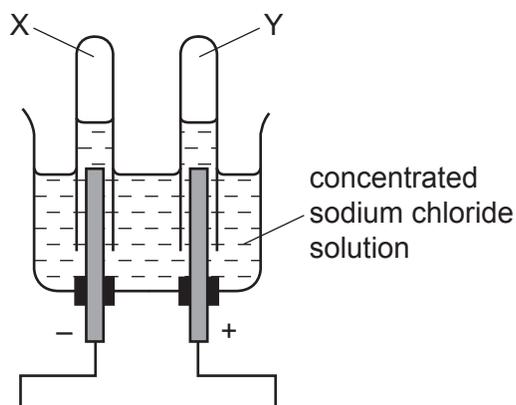


The experiment did not work.

What change is needed in the experiment to make it work?

- A Add solid copper(II) sulfate to the electrolyte.
- B Increase the temperature of the electrolyte.
- C Replace the copper electrode by a carbon electrode.
- D Reverse the connections to the battery.

44 When concentrated sodium chloride solution is electrolysed, elements X and Y are formed.

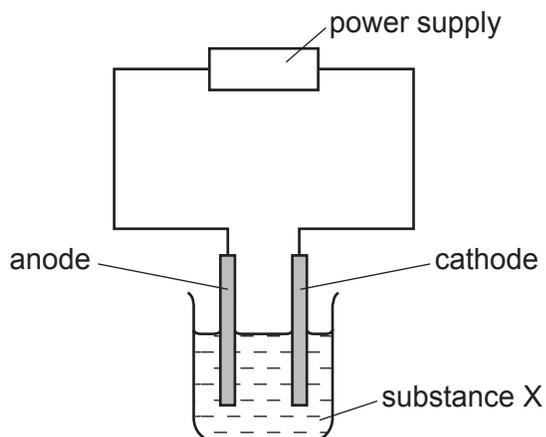


What are X and Y?

	X	Y
A	chlorine	hydrogen
B	hydrogen	chlorine
C	hydrogen	oxygen
D	oxygen	hydrogen

45 Substance X was electrolysed in an electrolytic cell.

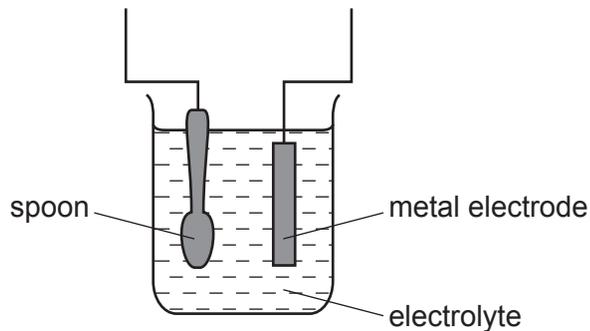
A coloured gas was formed at the anode and a metal was formed at the cathode.



What is substance X?

- A** aqueous sodium chloride
- B** molten lead bromide
- C** molten zinc oxide
- D** solid sodium chloride

46 The diagram shows apparatus for plating a spoon with silver.



Which statement is **not** correct?

- A** Silver would stick to the spoon because it is a very reactive metal.
- B** The electrolyte would be a silver salt dissolved in water.
- C** The metal electrode would be made from silver.
- D** The spoon would be connected to the negative of the power supply.

47 Aqueous copper(II) sulfate solution is electrolysed using inert electrodes.

Copper(II) ions (Cu^{2+}), hydrogen ions (H^+), hydroxide ions (OH^-) and sulfate ions (SO_4^{2-}) are present in the solution.

To which electrodes are the ions attracted during this electrolysis?

	attracted to anode	attracted to cathode
A	Cu^{2+} and H^+	OH^- and SO_4^{2-}
B	Cu^{2+} and SO_4^{2-}	H^+ and OH^-
C	H^+ and OH^-	Cu^{2+} and SO_4^{2-}
D	OH^- and SO_4^{2-}	Cu^{2+} and H^+

48 Three electrolysis cells are set up. Each cell has inert electrodes.

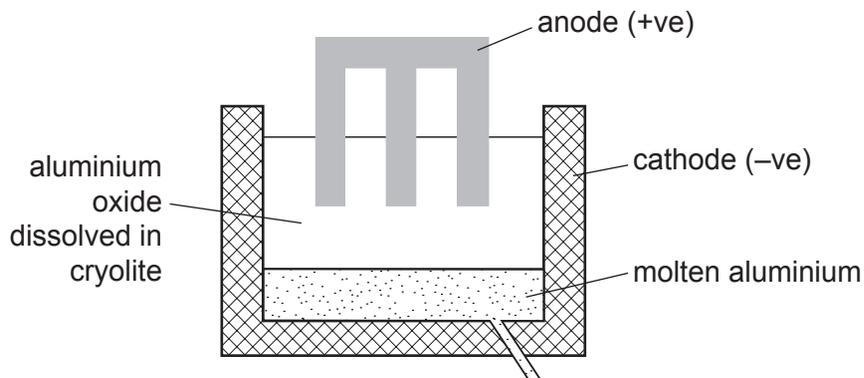
The electrolytes are listed below.

- cell 1 aqueous sodium chloride
- cell 2 concentrated hydrochloric acid
- cell 3 molten lead(II) bromide

In which cells is a gas formed at **both** electrodes?

- A** 1 and 2 **B** 1 and 3 **C** 2 only **D** 3 only

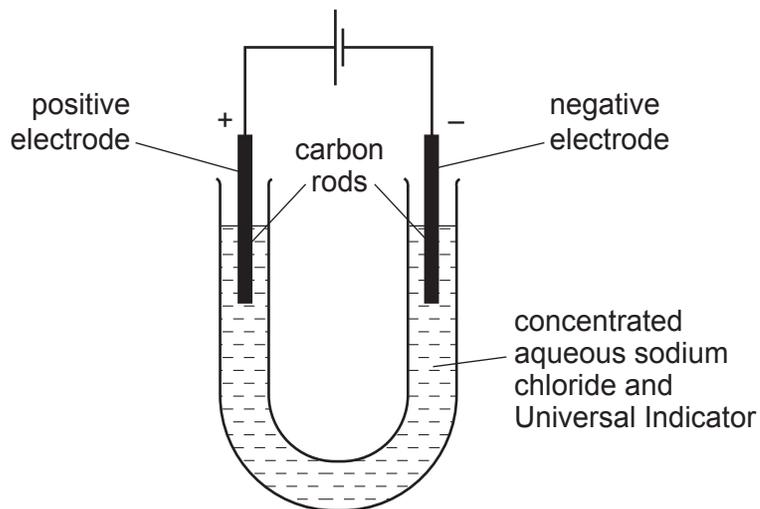
49 The diagram shows how aluminium is manufactured by electrolysis.



What are the anode and cathode made of?

	anode	cathode
A	aluminium	aluminium
B	aluminium	graphite
C	graphite	aluminium
D	graphite	graphite

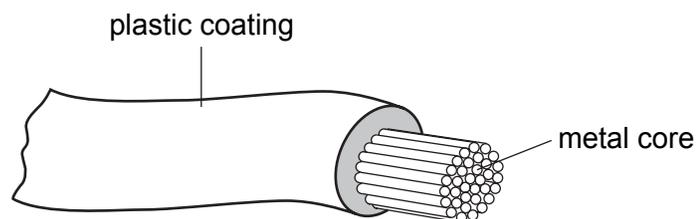
50 The diagram shows the electrolysis of concentrated aqueous sodium chloride.



What is the colour of the Universal Indicator at each electrode after five minutes?

	colour at anode (+ electrode)	colour at cathode (- electrode)
A	blue/purple	red
B	red	blue/purple
C	red	colourless
D	colourless	blue/purple

51 The diagram shows an electrical cable.



Which statement about the substances used is correct?

- A** The coating is plastic because it conducts electricity well.
- B** The core is copper because it conducts electricity well.
- C** The core is copper because it is cheap and strong.
- D** The core is iron because it is cheap and strong.

52 Aluminium is extracted from its oxide by electrolysis.

The oxide is dissolved in1..... cryolite and aluminium is deposited at the2.....

Which words correctly complete gaps 1 and 2?

	1	2
A	aqueous	cathode
B	aqueous	anode
C	molten	cathode
D	molten	anode

